

**Final Massachusetts Integrated List of Waters for the
Clean Water Act 2022 Reporting Cycle**

**Appendix 7
Buzzards Bay Coastal Drainage Area
Assessment and Listing Decision Summary**

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May 2023

CN 568.1



Massachusetts Department of Environmental Protection

MassDEP's mission is to protect and enhance the Commonwealth's natural resources – air, water, and land – to provide for the health, safety, and welfare of all people, and to ensure a clean and safe environment for future generations. In carrying out this mission MassDEP commits to address and advance environmental justice and equity for all people of the Commonwealth; provide meaningful, inclusive opportunities for people to participate in agency decisions that affect their lives; and ensure a diverse workforce that reflects the communities we serve.

Watershed Planning Program

The Watershed Planning Program is a statewide program in the Division of Watershed Management, Bureau of Water Resources, at MassDEP. We are stewards of the water resources of Massachusetts. Together with other state environmental agencies, we share in the duty and responsibility to protect, enhance, and restore the quality and value of the waters of the Commonwealth. We are guided by the federal Clean Water Act and work to secure the environmental, recreational, and public health benefits of clean water for the residents of Massachusetts. The Watershed Planning Program is organized into five Sections that each have a different technical focus under the Clean Water Act: (1) Surface Water Quality Standards; (2) Surface Water Quality Monitoring; (3) Data Management and Water Quality Assessment; (4) Total Maximum Daily Load; and (5) Nonpoint Source Pollution.

Disclaimer

References to trade names, commercial products, manufacturers, or distributors in this report constituted neither endorsement nor recommendation by MassDEP.

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Notice of Availability

This report is available on the Massachusetts Department of Environmental Protection website:

<https://www.mass.gov/lists/integrated-lists-of-waters-related-reports>.

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2022 Cycle Impairment Changes

Waterbody	AU_ID	2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
"Inner" Sippican Harbor	MA95-70	5	5	Dissolved Oxygen		Added
"Inner" Sippican Harbor	MA95-70	5	5	Estuarine Bioassessments		Unchanged
"Inner" Sippican Harbor	MA95-70	5	5	Fecal Coliform	36172	Unchanged
"Inner" Sippican Harbor	MA95-70	5	5	Nitrogen, Total		Unchanged
"Inner" Sippican Harbor	MA95-70	5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
Abner Pond	MA95001	3	3	None		Unchanged
Acushnet River	MA95-31	5	5	Dissolved Oxygen		Unchanged
Acushnet River	MA95-31	5	5	Enterococcus	36170	Unchanged
Acushnet River	MA95-31	5	5	Escherichia Coli (E. Coli)	36170	Unchanged
Acushnet River	MA95-31	5	5	Fecal Coliform	36170	Unchanged
Acushnet River	MA95-31	5	5	Nutrients		Removed
Acushnet River	MA95-32	5	5	Benthic Macroinvertebrates		Unchanged
Acushnet River	MA95-32	5	5	Dissolved Oxygen		Unchanged
Acushnet River	MA95-32	5	5	Enterococcus	36170	Unchanged
Acushnet River	MA95-32	5	5	Escherichia Coli (E. Coli)	36170	Unchanged
Acushnet River	MA95-32	5	5	Fecal Coliform	36170	Unchanged
Acushnet River	MA95-32	5	5	Nutrients		Removed
Acushnet River	MA95-33	5	5	(Debris*)		Unchanged
Acushnet River	MA95-33	5	5	Color		Unchanged
Acushnet River	MA95-33	5	5	Dissolved Oxygen		Unchanged
Acushnet River	MA95-33	5	5	Enterococcus	36171	Unchanged
Acushnet River	MA95-33	5	5	Fecal Coliform	36171	Unchanged
Acushnet River	MA95-33	5	5	Metals		Unchanged
Acushnet River	MA95-33	5	5	Nitrogen, Total		Unchanged
Acushnet River	MA95-33	5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
Acushnet River	MA95-33	5	5	Odor		Unchanged
Acushnet River	MA95-33	5	5	Oil and Grease		Unchanged
Acushnet River	MA95-33	5	5	PCBs in Fish Tissue		Added
Acushnet River	MA95-33	5	5	Polychlorinated Biphenyls (PCBs)		Unchanged
Acushnet River	MA95-33	5	5	Trash		Unchanged
Agawam River	MA95-28	3	4c	(Fish Passage Barrier*)		Added
Agawam River	MA95-29	5	5	Algae		Unchanged
Agawam River	MA95-29	5	5	Fecal Coliform	36171	Unchanged
Agawam River	MA95-29	5	5	Nitrogen, Total		Unchanged
Agawam River	MA95-29	5	5	Nutrient/Eutrophication Biological Indicators		Added
Allen Creek	MA95-97	--	5	Escherichia Coli (E. Coli)		Added
Allens Pond	MA95-107	--	5	Dissolved Oxygen		Added
Allens Pond	MA95-107	--	5	Nitrogen, Total		Added

Waterbody	AU_ID	2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
Allens Pond	MA95-107	--	5	Nutrient/Eutrophication Biological Indicators		Added
Angeline Brook	MA95-83	5	5	Enterococcus		Unchanged
Apponagansett Bay	MA95-39	5	5	Dissolved Oxygen		Added
Apponagansett Bay	MA95-39	5	5	Estuarine Bioassessments		Unchanged
Apponagansett Bay	MA95-39	5	5	Fecal Coliform	36172	Unchanged
Apponagansett Bay	MA95-39	5	5	Nitrogen, Total		Unchanged
Apponagansett Bay	MA95-39	5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
Apponagansett Bay	MA95-39	5	5	PCBs in Fish Tissue		Unchanged
Aucoot Cove	MA95-09	2	5	Estuarine Bioassessments		Added
Aucoot Cove	MA95-71	5	5	Dissolved Oxygen		Unchanged
Aucoot Cove	MA95-71	5	5	Fecal Coliform	36172	Unchanged
Aucoot Cove	MA95-71	5	5	Nitrogen, Total		Unchanged
Aucoot Cove	MA95-71	5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
Aucoot Creek	MA95-72	5	5	Dissolved Oxygen		Unchanged
Aucoot Creek	MA95-72	5	5	Fecal Coliform	36172	Unchanged
Aucoot Creek	MA95-72	5	5	Nitrogen, Total		Unchanged
Aucoot Creek	MA95-72	5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
Back River	MA95-47	4a	4a	Fecal Coliform	36172	Unchanged
Barrett Pond	MA95004	2	2	None		Unchanged
Bates Pond	MA95007	3	3	None		Unchanged
Beaverdam Creek	MA95-53	5	5	Estuarine Bioassessments		Unchanged
Beaverdam Creek	MA95-53	5	5	Fecal Coliform	36172	Unchanged
Beaverdam Creek	MA95-53	5	5	Nitrogen, Total		Unchanged
Big Rocky Pond	MA95119	3	3	None		Unchanged
Big Sandy Pond	MA95011	3	3	None		Unchanged
Blackmore Reservoir	MA95015	3	3	None		Unchanged
Bourne Pond	MA95016	--	4c	(Fish Passage Barrier*)		Added
Brant Island Cove	MA95-93	--	5	Fecal Coliform		Added
Bread and Cheese Brook	MA95-58	4a	5	Enterococcus	36170	Unchanged
Bread and Cheese Brook	MA95-58	4a	5	Fecal Coliform	36170	Unchanged
Bread and Cheese Brook	MA95-58	4a	5	Temperature		Added
Broad Marsh River	MA95-49	4a	4a	Fecal Coliform	36172	Unchanged
Butler Cove	MA95-77	5	5	Estuarine Bioassessments		Unchanged
Buttermilk Bay	MA95-01	5	5	Estuarine Bioassessments		Unchanged
Buttermilk Bay	MA95-01	5	5	Fecal Coliform	36172	Unchanged
Buttermilk Bay	MA95-01	5	5	Nutrient/Eutrophication Biological Indicators		Unchanged

Waterbody	AU_ID	2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
Buttonwood Brook	MA95-13	4a	4a	Enterococcus	36170	Unchanged
Buttonwood Brook	MA95-13	4a	4a	Escherichia Coli (E. Coli)	36170	Unchanged
Buttonwood Brook	MA95-13	4a	4a	Fecal Coliform	36170	Unchanged
Buttonwood Park Pond	MA95020	3	3	None		Unchanged
Buzzards Bay	MA95-62	5	5	Estuarine Bioassessments		Added
Buzzards Bay	MA95-62	5	5	Fecal Coliform	36172	Unchanged
Buzzards Bay	MA95-62	5	5	PCBs in Fish Tissue		Unchanged
Cape Cod Canal	MA95-14	4a	4a	Fecal Coliform	36171	Unchanged
Cedar Dell Lake	MA95021	3	5	Enterococcus		Added
Cedar Island Creek	MA95-52	4a	4a	Fecal Coliform	36172	Unchanged
Cedar Lake	MA95-96344	3	3	None		Unchanged
Charge Pond	MA95025	2	2	None		Unchanged
Clarks Cove	MA95-38	5	5	Dissolved Oxygen		Added
Clarks Cove	MA95-38	5	5	Enterococcus	36172	Unchanged
Clarks Cove	MA95-38	5	5	Estuarine Bioassessments		Added
Clarks Cove	MA95-38	5	5	Fecal Coliform	36172	Unchanged
Clarks Cove	MA95-38	5	5	Nitrogen, Total		Added
Clarks Cove	MA95-38	5	5	PCBs in Fish Tissue		Unchanged
College Pond	MA95030	2	2	None		Unchanged
Copicut Reservoir	MA95175	5	5	Mercury in Fish Tissue		Unchanged
Copicut River	MA95-43	5	5	Mercury in Fish Tissue		Unchanged
Copicut River	MA95-43	5	5	PCBs in Fish Tissue		Unchanged
Cornell Pond	MA95031	5	5	Mercury in Fish Tissue	33880	Unchanged
Cornell Pond	MA95031	5	5	PCBs in Fish Tissue		Unchanged
Crane Brook Bog Pond	MA95033	5	5	(Non-Native Aquatic Plants*)		Unchanged
Crane Brook Bog Pond	MA95033	5	5	Algae		Unchanged
Crane Brook Bog Pond	MA95033	5	5	Phosphorus, Total		Unchanged
Crooked River	MA95-51	4a	4a	Enterococcus		Removed
Crooked River	MA95-51	4a	4a	Fecal Coliform	36172	Unchanged
Curlew Pond	MA95034	2	2	None		Unchanged
Deer Pond	MA95036	3	3	None		Unchanged
Destruction Brook	MA95-90	--	3	None		Unchanged
Dicks Pond	MA95038	3	3	None		Unchanged
Doggett Brook	MA95-96	--	5	Benthic Macroinvertebrates		Added
Doggett Brook	MA95-96	--	5	Dissolved Oxygen		Added
Doggett Brook	MA95-96	--	5	Lead		Added
Dunham Pond	MA95044	5	5	Chlorophyll-a		Unchanged
Dunham Pond	MA95044	5	5	Transparency / Clarity		Unchanged
Dunhams Brook	MA95-73	2	5	Escherichia Coli (E. Coli)		Added
East Branch Westport River	MA95-40	4a	5	(Fish Passage Barrier*)		Added
East Branch Westport River	MA95-40	4a	5	Dissolved Oxygen		Added

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East Branch Westport River	MA95-40	4a	5	Enterococcus	36170	Unchanged
East Branch Westport River	MA95-40	4a	5	Fecal Coliform	36170	Unchanged
East Branch Westport River	MA95-41	5	4a	Estuarine Bioassessments	67640	Changed
East Branch Westport River	MA95-41	5	4a	Fecal Coliform	36171	Unchanged
East Branch Westport River	MA95-41	5	4a	Nitrogen, Total	67640	Changed
East Branch Westport River	MA95-41	5	4a	Nutrient/Eutrophication Biological Indicators	67640	Changed
East Head Pond	MA95177	3	3	None		Unchanged
East River	MA95-95	--	5	Estuarine Bioassessments		Added
East River	MA95-95	--	5	Fecal Coliform		Added
Eel Pond	MA95-48	4a	4a	Fecal Coliform	36172	Unchanged
Eel Pond	MA95-61	5	5	Dissolved Oxygen		Added
Eel Pond	MA95-61	5	5	Fecal Coliform	36172	Unchanged
Eel Pond	MA95-61	5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
Ezekiel Pond	MA95051	3	5	Mercury in Fish Tissue		Added
Fawn Pond	MA95053	3	3	None		Unchanged
Fearing Pond	MA95054	2	2	None		Unchanged
Federal Pond	MA95055	4c	4c	(Fanwort*)		Added
Federal Pond	MA95055	4c	4c	(Non-Native Aquatic Plants*)		Unchanged
Federal Pond	MA95055	4c	4c	(Swollen Bladderwort*)		Added
Fiddlers Cove	MA95-79	5	5	Dissolved Oxygen	R1_MA_2018_02	Changed
Fiddlers Cove	MA95-79	5	5	Estuarine Bioassessments	R1_MA_2018_02	Changed
Fiddlers Cove	MA95-79	5	5	Fecal Coliform		Unchanged
Fiddlers Cove	MA95-79	5	5	Nitrogen, Total	R1_MA_2018_02	Changed
Fiddlers Cove	MA95-79	5	5	Nutrient/Eutrophication Biological Indicators	R1_MA_2018_02	Changed
Five Mile Pond	MA95056	3	3	None		Unchanged
Flax Pond	MA95-96087	3	3	None		Unchanged
Fresh Meadow Pond	MA95174	4c	4c	(Fanwort*)		Added
Fresh Meadow Pond	MA95174	4c	4c	(Non-Native Aquatic Plants*)		Removed
Gallows Pond	MA95059	3	3	None		Unchanged
Giles Creek	MA95-89	2	3	None		Unchanged
Glen Charlie Pond	MA95061	3	3	None		Unchanged
Great Sippewisset Creek	MA95-23	4a	4a	Fecal Coliform	36172	Unchanged
Halfway Pond	MA95178	5	5	Harmful Algal Blooms		Unchanged
Halfway Pond	MA95178	5	5	Mercury in Fish Tissue		Added
Hammett Cove	MA95-56	5	5	Estuarine Bioassessments		Unchanged
Hammett Cove	MA95-56	5	5	Fecal Coliform	36172	Unchanged
Hammett Cove	MA95-56	5	5	Nitrogen, Total		Unchanged
Hammett Cove	MA95-56	5	5	Nutrient/Eutrophication Biological Indicators		Added

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Harbor Head	MA95-46	4a	4a	Estuarine Bioassessments	34284	Unchanged
Harbor Head	MA95-46	4a	4a	Fecal Coliform	36172	Unchanged
Herring Brook	MA95-21	5	5	Chlorophyll-a		Unchanged
Herring Brook	MA95-21	5	5	Fecal Coliform	36172	Unchanged
Herring Brook	MA95-21	5	5	Nitrogen, Total		Unchanged
Hiller Cove	MA95-10	4a	5	Estuarine Bioassessments		Added
Hiller Cove	MA95-10	4a	5	Fecal Coliform	36172	Unchanged
Horseneck Channel	MA95-87	2	2	None		Unchanged
Horseshoe Pond	MA95075	3	3	None		Unchanged
Kings Pond	MA95078	3	3	None		Unchanged
Kirby Brook	MA95-82	5	5	Enterococcus		Unchanged
Leonards Pond	MA95080	5	5	(Aquatic Plants (Macrophytes)*)		Unchanged
Leonards Pond	MA95080	5	5	(Curly-leaf Pondweed*)		Added
Leonards Pond	MA95080	5	5	(Non-Native Aquatic Plants*)		Unchanged
Leonards Pond	MA95080	5	5	Chlorophyll-a		Unchanged
Leonards Pond	MA95080	5	5	Transparency / Clarity		Unchanged
Little Bay	MA95-64	4a	4a	Fecal Coliform	36172	Unchanged
Little Buttermilk Bay	MA95-76	5	5	Estuarine Bioassessments		Unchanged
Little Buttermilk Bay	MA95-76	5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
Little Long Pond	MA95088	3	3	None		Unchanged
Little Long Pond	MA95089	3	3	None		Unchanged
Little River	MA95-66	2	2	None		Unchanged
Little Rocky Pond	MA95091	3	3	None		Unchanged
Little Sandy Pond	MA95092	3	3	None		Unchanged
Little Sippewisset Marsh	MA95-24	4a	4a	Fecal Coliform	36172	Unchanged
Little West Pond	MA95093	3	3	None		Unchanged
Long Duck Pond	MA95095	3	3	None		Unchanged
Long Pond	MA95096	3	3	None		Unchanged
Long Pond	MA95097	4a	4a	Mercury in Fish Tissue	33880	Unchanged
Mare Pond	MA95172	3	3	None		Unchanged
Marys Pond	MA95100	2	5	Mercury in Fish Tissue		Added
Mattapoissett Harbor	MA95-35	5	5	Dissolved Oxygen		Added
Mattapoissett Harbor	MA95-35	5	5	Estuarine Bioassessments		Unchanged
Mattapoissett Harbor	MA95-35	5	5	Fecal Coliform	36172	Unchanged
Mattapoissett Harbor	MA95-35	5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
Mattapoissett River	MA95-36	5	5	Benthic Macroinvertebrates		Added
Mattapoissett River	MA95-36	5	5	Enterococcus		Unchanged
Mattapoissett River	MA95-36	5	5	Escherichia Coli (E. Coli)		Unchanged

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Mattapoisett River	MA95-60	4a	5	Dissolved Oxygen		Added
Mattapoisett River	MA95-60	4a	5	Fecal Coliform	36172	Unchanged
Megansett Harbor	MA95-19	5	5	Estuarine Bioassessments	R1_MA_2020_07	Changed
Megansett Harbor	MA95-19	5	5	Fecal Coliform		Unchanged
Megansett Harbor	MA95-19	5	5	Nutrient/Eutrophication Biological Indicators	R1_MA_2020_07	Changed
Micajah Pond	MA95102	3	3	None		Unchanged
Mill Pond	MA95105	4c	5	(Fish Passage Barrier*)		Added
Mill Pond	MA95105	4c	5	(Non-Native Aquatic Plants*)		Unchanged
Mill Pond	MA95105	4c	5	Harmful Algal Blooms		Added
Nasketucket Bay	MA95-65	4a	5	Estuarine Bioassessments		Added
Nasketucket Bay	MA95-65	4a	5	Fecal Coliform	36172	Unchanged
Nasketucket River	MA95-104	--	5	(Fish Passage Barrier*)		Added
Nasketucket River	MA95-104	--	5	Dissolved Oxygen		Added
Nasketucket River	MA95-67	5	5	Nitrogen, Total		Unchanged
New Bedford Inner Harbor	MA95-42	5	5	(Debris*)		Unchanged
New Bedford Inner Harbor	MA95-42	5	5	Dissolved Oxygen		Unchanged
New Bedford Inner Harbor	MA95-42	5	5	Enterococcus	36171	Unchanged
New Bedford Inner Harbor	MA95-42	5	5	Fecal Coliform	36171	Unchanged
New Bedford Inner Harbor	MA95-42	5	5	Metals		Unchanged
New Bedford Inner Harbor	MA95-42	5	5	Nitrogen, Total		Unchanged
New Bedford Inner Harbor	MA95-42	5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
New Bedford Inner Harbor	MA95-42	5	5	Odor		Unchanged
New Bedford Inner Harbor	MA95-42	5	5	Oil and Grease		Unchanged
New Bedford Inner Harbor	MA95-42	5	5	PCBs in Fish Tissue		Unchanged
New Bedford Inner Harbor	MA95-42	5	5	Polychlorinated Biphenyls (PCBs)		Unchanged
New Bedford Inner Harbor	MA95-42	5	5	Trash		Unchanged
New Bedford Reservoir	MA95110	5	5	(Aquatic Plants (Macrophytes)*)		Unchanged
New Bedford Reservoir	MA95110	5	5	(Non-Native Aquatic Plants*)		Unchanged
New Bedford Reservoir	MA95110	5	5	DDT in Fish Tissue		Unchanged
New Bedford Reservoir	MA95110	5	5	Dissolved Oxygen		Unchanged

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New Bedford Reservoir	MA95110	5	5	Mercury in Fish Tissue		Unchanged
New Bedford Reservoir	MA95110	5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
New Bedford Reservoir	MA95110	5	5	Phosphorus, Total		Unchanged
New Long Pond	MA95112	3	3	None		Unchanged
Noquochoke Lake	MA95113	5	5	(Aquatic Plants (Macrophytes)*)		Changed
Noquochoke Lake	MA95113	5	5	(Fish Passage Barrier*)		Added
Noquochoke Lake	MA95113	5	5	(Non-Native Aquatic Plants*)		Unchanged
Noquochoke Lake	MA95113	5	5	(Swollen Bladderwort*)		Added
Noquochoke Lake	MA95113	5	5	Enterococcus		Unchanged
Noquochoke Lake	MA95113	5	5	Mercury in Fish Tissue	33880	Unchanged
Noquochoke Lake	MA95113	5	5	PCBs in Fish Tissue		Unchanged
Noquochoke Lake	MA95113	5	5	Turbidity		Unchanged
Noquochoke Lake	MA95170	5	5	(Aquatic Plants (Macrophytes)*)		Changed
Noquochoke Lake	MA95170	5	5	(Non-Native Aquatic Plants*)		Unchanged
Noquochoke Lake	MA95170	5	5	Mercury in Fish Tissue	33880	Unchanged
Noquochoke Lake	MA95170	5	5	Nutrient/Eutrophication Biological Indicators		Added
Noquochoke Lake	MA95170	5	5	PCBs in Fish Tissue		Unchanged
Noquochoke Lake	MA95170	5	5	Turbidity		Unchanged
Noquochoke Lake	MA95171	5	5	(Aquatic Plants (Macrophytes)*)		Changed
Noquochoke Lake	MA95171	5	5	(Non-Native Aquatic Plants*)		Unchanged
Noquochoke Lake	MA95171	5	5	Mercury in Fish Tissue	33880	Unchanged
Noquochoke Lake	MA95171	5	5	Nutrient/Eutrophication Biological Indicators		Added
Noquochoke Lake	MA95171	5	5	PCBs in Fish Tissue		Unchanged
Noquochoke Lake	MA95171	5	5	Turbidity		Unchanged
Onset Bay	MA95-02	5	5	Estuarine Bioassessments		Unchanged
Onset Bay	MA95-02	5	5	Fecal Coliform	36172	Unchanged
Outer New Bedford Harbor	MA95-63	5	5	Dissolved Oxygen		Unchanged
Outer New Bedford Harbor	MA95-63	5	5	Enterococcus	36172	Unchanged
Outer New Bedford Harbor	MA95-63	5	5	Fecal Coliform	36172	Unchanged
Outer New Bedford Harbor	MA95-63	5	5	Metals		Removed
Outer New Bedford Harbor	MA95-63	5	5	Nitrogen, Total		Unchanged
Outer New Bedford Harbor	MA95-63	5	5	Other Organics		Removed
Outer New Bedford Harbor	MA95-63	5	5	PCBs in Fish Tissue		Unchanged
Oyster Pond	MA95927	4a	4a	Dissolved Oxygen	34331	Unchanged
Oyster Pond	MA95927	4a	4a	Estuarine Bioassessments	34331	Unchanged

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Parker Mills Pond	MA95115	5	5	(Non-Native Aquatic Plants*)		Unchanged
Parker Mills Pond	MA95115	5	5	Dissolved Oxygen		Added
Parker Mills Pond	MA95115	5	5	Phosphorus, Total		Unchanged
Paskamanset River	MA95-11	5	5	(Fish Passage Barrier*)		Added
Paskamanset River	MA95-11	5	5	Combined Biota/Habitat Bioassessments		Unchanged
Paskamanset River	MA95-11	5	5	Dissolved Oxygen		Added
Paskamanset River	MA95-11	5	5	Enterococcus		Unchanged
Paskamanset River	MA95-11	5	5	Escherichia Coli (E. Coli)		Unchanged
Paskamanset River	MA95-11	5	5	Lead		Added
Phinneys Harbor	MA95-15	4a	4a	Estuarine Bioassessments	35069	Unchanged
Phinneys Harbor	MA95-15	4a	4a	Fecal Coliform	36172	Unchanged
Phinneys Harbor	MA95-15	4a	4a	Nitrogen, Total	35069	Unchanged
Pocasset Harbor	MA95-17	5	5	Dissolved Oxygen		Added
Pocasset Harbor	MA95-17	5	5	Estuarine Bioassessments		Unchanged
Pocasset Harbor	MA95-17	5	5	Fecal Coliform	36172	Unchanged
Pocasset Harbor	MA95-17	5	5	Nitrogen, Total		Added
Pocasset River	MA95-16	4a	5	Dissolved Oxygen		Added
Pocasset River	MA95-16	4a	5	Fecal Coliform	36172	Unchanged
Queen Sewell Pond	MA95180	5	5	Harmful Algal Blooms		Unchanged
Quissett Harbor	MA95-25	5	4a	Estuarine Bioassessments	R1_MA_2018_03	Changed
Quissett Harbor	MA95-25	5	4a	Fecal Coliform	36172	Unchanged
Quissett Harbor	MA95-25	5	4a	Nitrogen, Total	R1_MA_2018_03	Changed
Quissett Harbor	MA95-25	5	4a	Nutrient/Eutrophication Biological Indicators	R1_MA_2018_03	Changed
Rands Harbor	MA95-78	5	5	Estuarine Bioassessments	R1_EPA_MA_01	Changed
Rands Harbor	MA95-78	5	5	Fecal Coliform		Unchanged
Rands Harbor	MA95-78	5	5	Nitrogen, Total	R1_EPA_MA_01	Changed
Rands Harbor	MA95-78	5	5	Nutrient/Eutrophication Biological Indicators	R1_EPA_MA_01	Changed
Red Brook	MA95-74	2	2	None		Unchanged
Red Brook Harbor	MA95-18	5	5	Estuarine Bioassessments		Unchanged
Red Brook Harbor	MA95-18	5	5	Fecal Coliform	36172	Unchanged
Red Brook Harbor	MA95-18	5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
Red Brook Pond	MA95-96256	--	4c	(Fish Passage Barrier*)		Added
Rocky Meadow Brook Pond	MA95118	3	3	None		Unchanged
Rocky Pond	MA95179	3	3	None		Unchanged
Round Pond	MA95123	3	3	None		Unchanged
Salters Point Pond	MA95-106	--	5	Dissolved Oxygen		Added
Salters Point Pond	MA95-106	--	5	Nitrogen, Total		Added
Salters Point Pond	MA95-106	--	5	Nutrient/Eutrophication Biological Indicators		Added

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Sampson Pond	MA95125	5	5	(Asian Clam*)		Added
Sampson Pond	MA95125	5	5	(Fanwort*)		Added
Sampson Pond	MA95125	5	5	(Non-Native Aquatic Plants*)		Unchanged
Sampson Pond	MA95125	5	5	(Non-Native Fish/Shellfish/Zooplankton*)		Removed
Sampson Pond	MA95125	5	5	(Swollen Bladderwort*)		Added
Sampson Pond	MA95125	5	5	DDT in Fish Tissue		Unchanged
Sampson Pond	MA95125	5	5	Mercury in Fish Tissue		Unchanged
Sand Pond	MA95127	3	3	None		Unchanged
Sandy Pond	MA95128	3	3	None		Unchanged
Shell Point Bay	MA95-94	--	5	Fecal Coliform		Added
Shingle Island River	MA95-12	5	5	Enterococcus		Unchanged
Sippican Harbor	MA95-100	--	2	None		Unchanged
Sippican Harbor	MA95-69	2	5	Estuarine Bioassessments		Added
Sippican River	MA95-06	5	5	Chlorophyll-a		Unchanged
Sippican River	MA95-06	5	5	Dissolved Oxygen		Unchanged
Sippican River	MA95-06	5	5	Enterococcus		Unchanged
Sippican River	MA95-07	4a	4a	Fecal Coliform	36172	Unchanged
Slocums River	MA95-34	5	4a	Dissolved Oxygen	R1_MA_2020_01	Changed
Slocums River	MA95-34	5	4a	Estuarine Bioassessments	R1_MA_2020_01	Changed
Slocums River	MA95-34	5	4a	Fecal Coliform	36172	Unchanged
Slocums River	MA95-34	5	4a	Nitrogen, Total	R1_MA_2020_01	Changed
Slocums River	MA95-34	5	4a	Nutrient/Eutrophication Biological Indicators	R1_MA_2020_01	Changed
Snell Creek	MA95-44	4a	4a	Enterococcus	36170	Unchanged
Snell Creek	MA95-44	4a	4a	Escherichia Coli (E. Coli)	36170	Unchanged
Snell Creek	MA95-44	4a	4a	Fecal Coliform	36170	Unchanged
Snell Creek	MA95-45	4a	4a	Enterococcus	36170	Unchanged
Snell Creek	MA95-45	4a	4a	Escherichia Coli (E. Coli)	36170	Unchanged
Snell Creek	MA95-45	4a	4a	Fecal Coliform	36170	Unchanged
Snell Creek	MA95-59	4a	4a	Fecal Coliform	36172	Unchanged
Snipatuit Pond	MA95137	4a	4a	(Fanwort*)		Added
Snipatuit Pond	MA95137	4a	4a	Mercury in Fish Tissue	33880	Unchanged
South Meadow Brook Pond	MA95139	3	3	None		Unchanged
South Meadow Pond	MA95140	3	3	None		Unchanged
Southwest Atwood Bog Pond	MA95141	3	3	None		Unchanged
Spectacle Pond	MA95142	3	3	None		Unchanged
Squeteague Harbor	MA95-55	5	5	Fecal Coliform		Added
Squeteague Harbor	MA95-55	5	5	Nutrient/Eutrophication Biological Indicators	R1_MA_2020_07	Changed
The Let	MA95-88	2	5	Estuarine Bioassessments		Added
Three Cornered Pond	MA95145	3	3	None		Unchanged
Tihonet Pond	MA95146	5	5	(Fish Passage Barrier*)		Added
Tihonet Pond	MA95146	5	5	Dissolved Oxygen		Unchanged

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Tinkham Pond	MA95148	3	4c	(Fish Passage Barrier*)		Added
Turner Pond	MA95151	4a	5	(Fish Passage Barrier*)		Added
Turner Pond	MA95151	4a	5	(Swollen Bladderwort*)		Added
Turner Pond	MA95151	4a	5	Enterococcus		Added
Turner Pond	MA95151	4a	5	Mercury in Fish Tissue	33880	Unchanged
Union Pond	MA95152	3	3	None		Unchanged
Unnamed Tributary	MA95-101	--	4c	(Fish Passage Barrier*)		Added
Unnamed Tributary	MA95-102	--	4c	(Fish Passage Barrier*)		Added
Unnamed Tributary	MA95-57	3	3	None		Unchanged
Unnamed Tributary	MA95-75	2	5	Escherichia Coli (E. Coli)		Added
Unnamed Tributary	MA95-75	2	5	Temperature		Added
Unnamed Tributary	MA95-80	2	2	None		Unchanged
Unnamed Tributary	MA95-81	2	3	None		Unchanged
Unnamed Tributary	MA95-84	2	2	None		Unchanged
Unnamed Tributary	MA95-91	--	3	None		Unchanged
Unnamed Tributary	MA95-92	--	3	None		Unchanged
Unnamed Tributary	MA95-98	--	2	None		Unchanged
Unnamed Tributary	MA95-99	--	2	None		Unchanged
Vaughn Pond	MA95153	3	3	None		Unchanged
Wankinco River	MA95-103	--	4c	(Fish Passage Barrier*)		Added
Wankinco River	MA95-50	4a	4a	Fecal Coliform	36172	Unchanged
Wankinco River	MA95-85	3	3	None		Unchanged
Wankinco River	MA95-86	3	4c	(Fish Passage Barrier*)		Added
Wareham River	MA95-03	5	5	Chlorophyll-a		Added
Wareham River	MA95-03	5	5	Estuarine Bioassessments		Unchanged
Wareham River	MA95-03	5	5	Fecal Coliform	36172	Unchanged
Wareham River	MA95-03	5	5	Nitrogen, Total		Unchanged
Wenham Pond	MA95158	2	2	None		Unchanged
West Branch Westport River	MA95-37	5	4a	Estuarine Bioassessments	67641	Changed
West Branch Westport River	MA95-37	5	4a	Fecal Coliform	36172	Unchanged
West Branch Westport River	MA95-37	5	4a	Nitrogen, Total	67641	Changed
West Branch Westport River	MA95-37	5	4a	Nutrient/Eutrophication Biological Indicators	67641	Changed
West Falmouth Harbor	MA95-22	4a	5	Estuarine Bioassessments	34332, 34328	Unchanged

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West Falmouth Harbor	MA95-22	4a	5	Fecal Coliform	36172	Unchanged
West Falmouth Harbor	MA95-22	4a	5	Nitrogen, Total	34332, 34918, 34917, 34328	Unchanged
West Falmouth Harbor	MA95-22	4a	5	Nutrient/Eutrophication Biological Indicators		Added
Westport River	MA95-54	4a	4a	Fecal Coliform	36172	Unchanged
Weweantic River	MA95-04	5	5	(Fish Passage Barrier*)		Added
Weweantic River	MA95-04	5	5	(Non-Native Aquatic Plants*)		Unchanged
Weweantic River	MA95-04	5	5	Enterococcus		Unchanged
Weweantic River	MA95-05	5	5	Dissolved Oxygen		Added
Weweantic River	MA95-05	5	5	Enterococcus	36172	Unchanged
Weweantic River	MA95-05	5	5	Estuarine Bioassessments		Unchanged
Weweantic River	MA95-05	5	5	Fecal Coliform	36172	Unchanged
Weweantic River	MA95-05	5	5	Nitrogen, Total		Unchanged
Weweantic River	MA95-05	5	5	Nutrient/Eutrophication Biological Indicators		Added
White Island Pond, East Basin	MA95166	4c	4c	(Curly-leaf Pondweed*)		Added
White Island Pond, East Basin	MA95166	4c	4c	(Eurasian Water Milfoil, Myriophyllum Spicatum*)		Added
White Island Pond, East Basin	MA95166	4c	4c	(Fanwort*)		Added
White Island Pond, East Basin	MA95166	4c	4c	(Non-Native Aquatic Plants*)		Removed
White Island Pond, East Basin	MA95166	4c	4c	(Swollen Bladderwort*)		Added
White Island Pond, West Basin	MA95173	4c	4c	(Brittle Naiad, Najas Minor*)		Added
White Island Pond, West Basin	MA95173	4c	4c	(Curly-leaf Pondweed*)		Added
White Island Pond, West Basin	MA95173	4c	4c	(Fanwort*)		Added
White Island Pond, West Basin	MA95173	4c	4c	(Non-Native Aquatic Plants*)		Removed
Whites Pond	MA95168	3	3	None		Unchanged
Wild Harbor	MA95-20	5	4a	Estuarine Bioassessments	R1_EPA_MA_04	Changed
Wild Harbor	MA95-20	5	4a	Fecal Coliform	36172	Unchanged
Wild Harbor	MA95-20	5	4a	Nitrogen, Total	R1_EPA_MA_04	Changed
Wild Harbor	MA95-20	5	4a	Nutrient/Eutrophication Biological Indicators	R1_EPA_MA_04	Changed
Wild Harbor River	MA95-68	5	4a	Fecal Coliform	36172	Unchanged
Wild Harbor River	MA95-68	5	4a	Nutrient/Eutrophication Biological Indicators	R1_EPA_MA_04	Changed
Wings Cove	MA95-105	--	5	Estuarine Bioassessments		Added
Wings Cove	MA95-105	--	5	Fecal Coliform		Added
Wings Cove	MA95-105	--	5	Nitrogen, Total		Added

"Inner" Sippican Harbor (MA95-70)

Location:	The waters landward of a line from Allen Point, Marion around the southeastern tip of Ram Island, then westerly from the southern tip of Ram Island to the point of land south of Nyes Wharf, Marion excluding Hammett Cove (formerly part of 2006 segment: Sippican Harbor MA95-08).
AU Type:	ESTUARY
AU Size:	0.57 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Dissolved Oxygen		Added
5	5	Estuarine Bioassessments		Unchanged
5	5	Fecal Coliform	36172	Unchanged
5	5	Nitrogen, Total		Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Source Unknown (N)	X					
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Source Unknown (N)	X					
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)	X					

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an ~50% loss of eelgrass bed habitat in “Inner” Sippican Harbor between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in the Inner Sippican Harbor, Marion (MA95-70) in the summers of 2015-2019, from inner to outer as follows: BBC_SH1, BBC_SH2, and BBC_SH3A. All three stations were located just off shore along the west bank (from jetties or docks). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column (at depths ranging 1.8m at BBC_SH1 to 3.4m out at BBC_SH3A) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 29°C (n=530), the minimum dissolved oxygen (DO) was 2.0mg/L (n=547), <6.0mg/L 173 times (~32% of the measurements overall) and <5.0mg/L 48 times (~9.0% of the measurements overall). Excursions from the 6.0mg/L DO criterion occurred most frequently (55-91% of the measurements annually) at the inner-most station (BBC_SH1 throughout the water column), though also at the other two stations. The only severe excursions of the criteria (<5.0mg/L) were documented at BBC_SH1 (14-45% of the measurements annually). Nutrient sampling efforts (ebb tides in June-September n=43, maximum 0.95mg/L) documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.36-0.61mg/L, 4/7 times being >0.4mg/L (the majority of excursions occurring at BBC_SH1). The maximum Chlorophyll *a* was 25.01µg/L (n=105), on 49 occasions >5µg/L and elevated (>10µg/L) at least once or twice a year at the inner-most station (BBC_SH1), though usually <10µg/L at BBC_SH2 and 3A. Secchi disk depth readings ranged from 0.3-3.0m (n=324). Ammonia-nitrogen concentrations were generally low (range 0.004 to 0.07mg/L (n=105)), though TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for Inner Sippican Harbor (MA95-70) will continue to be assessed as Not Supporting, based on the loss of eelgrass bed habitat documented by the MassDEP between 1995 and 2017 and the water quality data collected by the BBC staff/volunteers in 2015-2019 which are indicative of poor conditions (especially in the “inner” section of the AU); with the Estuarine Bioassessments, Total Nitrogen and Nutrient/Eutrophication Biological Indicators impairments being carried forward. A new impairment for Dissolved Oxygen is being added due to the low concentrations documented by the BBC, particularly in the inner harbor.

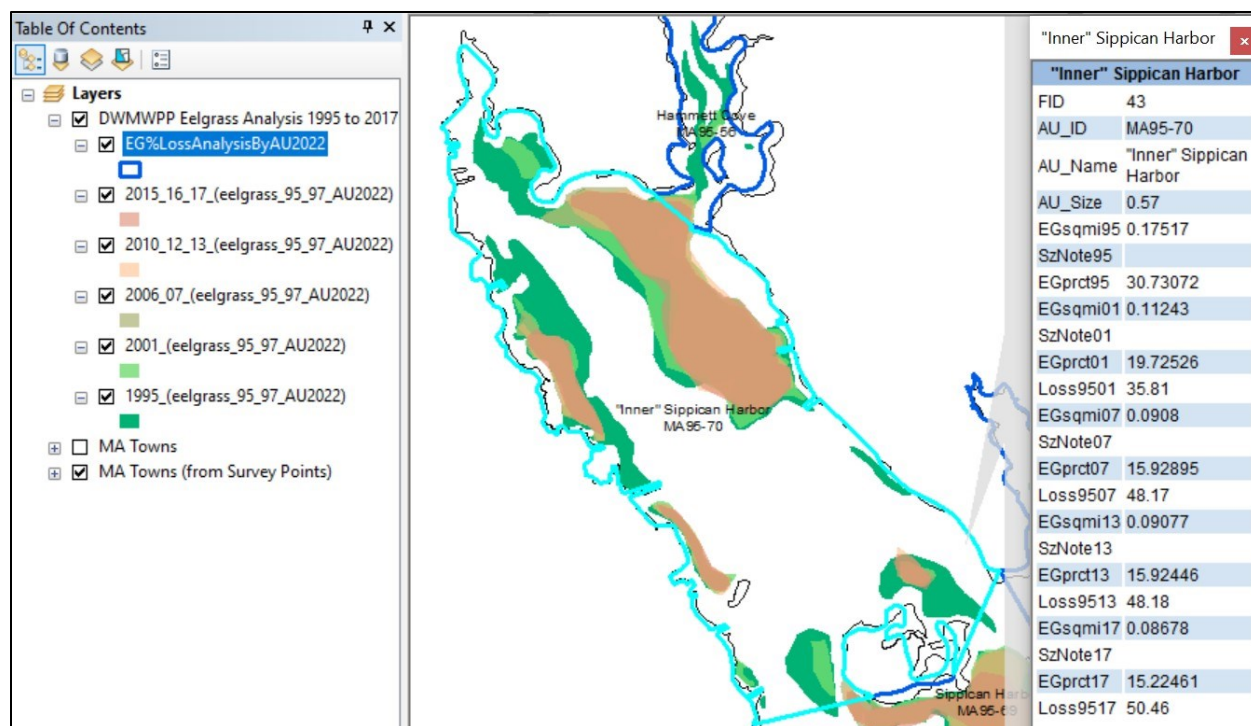
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_SH1	Buzzards Bay Coalition	Water Quality	Sippican Harbor	Sippican Harbor Inner, Marion	41.714032	-70.76535
BBC_SH2	Buzzards Bay Coalition	Water Quality	Sippican Harbor	Sippican Harbor Inner, Marion	41.704803	-70.759954
BBC_SH3A	Buzzards Bay Coalition	Water Quality	Sippican Harbor	Sippican Harbor Outer, Marion	41.697812	-70.754467

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for “Inner” Sippican Harbor MA95-70 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~50% loss of eelgrass bed habitat in "Inner" Sippican Harbor between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_SH1	05/28/15	09/24/15	0.2	24	3.7	5.4	79	29	8
BBC_SH1	05/28/15	09/24/15	1.8	24	3.5	5.4	75	29	4
BBC_SH1	01/06/16	09/25/16	0.2	22	2.0	5.9	50	14	5
BBC_SH1	01/06/16	09/25/16	1.9	21	4.0	5.9	62	19	0
BBC_SH1	01/09/17	09/19/17	0.2	23	4.4	6.1	57	17	0
BBC_SH1	03/08/17	09/19/17	2.1	22	4.7	6.0	55	14	0
BBC_SH1	06/06/18	09/19/18	0.2	11	4.1	5.2	91	27	0
BBC_SH1	06/06/18	09/19/18	2.0	11	4.2	5.3	82	45	0
BBC_SH1	06/05/19	09/24/19	0.2	18	4.6	5.6	67	22	0
BBC_SH1	06/05/19	09/24/19	2.0	18	3.7	5.5	56	28	6
BBC_SH2	05/28/15	09/24/15	0.2	19	5.6	6.8	21	0	0
BBC_SH2	05/28/15	09/24/15	2.6	18	5.4	6.8	28	0	0
BBC_SH2	05/31/16	09/23/16	0.2	18	5.5	6.7	17	0	0
BBC_SH2	05/31/16	09/23/16	2.6	18	5.0	6.4	22	0	0
BBC_SH2	05/31/17	09/12/17	0.2	18	6.0	6.6	0	0	0
BBC_SH2	05/31/17	09/12/17	2.7	18	6.0	6.6	0	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_SH2	06/11/18	09/20/18	0.2	16	5.5	6.3	6	0	0
BBC_SH2	06/11/18	09/20/18	2.6	15	6.0	6.2	0	0	0
BBC_SH2	05/30/19	09/22/19	0.2	19	5.0	7.0	11	0	0
BBC_SH2	05/30/19	09/22/19	2.7	19	5.3	6.7	11	0	0
BBC_SH3A	05/29/15	09/24/15	0.2	26	5.5	9.1	12	0	0
BBC_SH3A	05/29/15	09/24/15	2.6	26	5.7	8.6	8	0	0
BBC_SH3A	01/06/16	09/19/16	0.3	23	5.9	6.9	13	0	0
BBC_SH3A	01/06/16	09/19/16	3.1	19	5.8	6.9	21	0	0
BBC_SH3A	01/09/17	09/19/17	0.2	22	6.0	7.2	0	0	0
BBC_SH3A	01/09/17	09/19/17	2.6	23	6.0	7.1	0	0	0
BBC_SH3A	06/06/18	08/06/18	0.2	9	5.4	6.6	33	0	0
BBC_SH3A	06/06/18	08/06/18	3.0	9	5.5	6.6	33	0	0
BBC_SH3A	06/05/19	09/24/19	0.2	16	6.5	8.1	0	0	0
BBC_SH3A	06/05/19	06/19/19	3.4	2	6.4	6.7	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_SH1	05/28/15	09/24/15	0.2	28	24	27.2	23.8	0
BBC_SH1	05/28/15	09/24/15	1.9	23	19	27.4	23.6	0
BBC_SH1	01/06/16	09/26/16	0.2	27	21	29.0	23.8	0
BBC_SH1	01/06/16	09/25/16	2.0	21	16	27.2	23.0	0
BBC_SH1	01/09/17	09/19/17	0.2	27	23	27.0	22.4	0
BBC_SH1	03/08/17	09/19/17	2.0	22	19	24.9	22.1	0
BBC_SH1	06/06/18	09/19/18	0.2	13	12	27.3	23.5	0
BBC_SH1	06/06/18	09/19/18	2.0	11	10	27.7	23.3	0
BBC_SH1	06/05/19	09/24/19	0.2	22	20	26.5	23.1	0
BBC_SH1	06/05/19	09/24/19	2.0	18	16	26.8	22.7	0
BBC_SH2	05/28/15	09/24/15	0.2	23	21	26.3	23.6	0
BBC_SH2	05/28/15	09/24/15	2.6	19	17	26.2	23.2	0
BBC_SH2	05/31/16	09/23/16	0.2	21	17	28.0	24.1	0
BBC_SH2	05/31/16	09/23/16	2.6	19	15	27.5	23.3	0
BBC_SH2	05/31/17	09/12/17	0.2	22	21	28.0	23.6	0
BBC_SH2	05/31/17	09/12/17	2.6	22	21	28.0	23.6	0
BBC_SH2	06/11/18	09/20/18	0.2	18	17	29.0	24.8	0
BBC_SH2	06/11/18	09/20/18	2.5	17	16	28.0	24.4	0
BBC_SH2	06/04/19	09/22/19	0.2	22	20	26.4	23.0	0
BBC_SH2	06/04/19	09/22/19	2.7	18	16	26.4	22.2	0
BBC_SH3A	05/29/15	09/24/15	0.2	30	26	26.0	22.4	0
BBC_SH3A	05/29/15	09/24/15	2.6	26	22	26.0	21.7	0
BBC_SH3A	01/06/16	09/26/16	0.3	28	23	28.0	23.7	0
BBC_SH3A	01/06/16	09/19/16	3.1	19	15	26.6	22.9	0
BBC_SH3A	01/09/17	09/19/17	0.2	26	23	27.0	23.0	0
BBC_SH3A	01/09/17	09/19/17	2.6	22	19	26.3	22.4	0
BBC_SH3A	06/06/18	08/21/18	0.2	11	11	26.9	22.8	0
BBC_SH3A	06/06/18	08/06/18	3.0	9	9	26.9	22.4	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_SH3A	06/05/19	09/24/19	0.2	20	19	26.0	21.9	0
BBC_SH3A	06/05/19	06/19/19	3.4	2	2	19.9	18.8	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_SH1	2015	0.2	7	0.29	0.66	0.44	8	3.64	9.57	6.50	2	0
BBC_SH1	2016	0.2	4	0.32	0.95	0.61	10	1.18	25.01	7.61	6	2
BBC_SH1	2017	0.2	8	0.36	0.67	0.56	10	1.20	20.31	6.82	5	2
BBC_SH1	2018	0.2	2	0.44	0.51	0.48	4	4.56	20.12	9.61	1	1
BBC_SH1	2019	0.2	1	0.61	0.61	0.61	4	1.60	10.82	6.53	1	1
BBC_SH2	2015	0.2	--	--	--	--	4	4.62	8.26	5.93	1	0
BBC_SH2	2015	2.5	--	--	--	--	1	7.50	7.50	7.50	0	0
BBC_SH2	2016	0.2	--	--	--	--	4	2.24	6.30	4.19	3	0
BBC_SH2	2016	2.5	2	0.31	0.35	0.33	4	1.94	5.66	4.36	2	0
BBC_SH2	2017	0.2	2	0.49	0.51	0.50	4	3.80	6.37	4.74	3	0
BBC_SH2	2017	2.5	1	0.42	0.42	0.42	4	4.61	8.16	5.67	2	0
BBC_SH2	2018	0.2	3	0.32	0.40	0.36	4	2.85	5.84	4.21	3	0
BBC_SH2	2018	1.7	3	0.33	0.47	0.42	4	2.67	5.32	3.94	3	0
BBC_SH2	2019	0.2	2	0.40	0.43	0.41	4	2.60	8.02	5.69	1	0
BBC_SH3A	2015	0.2	1	0.38	0.38	0.38	8	2.24	10.86	6.26	2	1
BBC_SH3A	2016	0.2	1	0.29	0.29	0.29	10	1.17	5.89	3.07	9	0
BBC_SH3A	2017	0.2	3	0.26	0.50	0.39	10	1.39	6.10	3.69	9	0
BBC_SH3A	2018	0.2	3	0.35	0.38	0.36	4	2.71	6.09	4.55	2	0
BBC_SH3A	2019	0.2	--	--	--	--	4	4.52	8.82	6.48	1	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_SH1	05/28/15	09/24/15	25	0.9	2.1	1.4
BBC_SH1	05/31/16	09/25/16	23	1.0	2.8	1.6
BBC_SH1	06/06/17	09/19/17	23	0.9	2.0	1.5
BBC_SH1	06/06/18	09/19/18	15	0.9	1.9	1.4
BBC_SH1	06/05/19	09/24/19	21	1.1	2.0	1.5
BBC_SH2	05/28/15	09/24/15	22	0.9	1.9	1.5

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_SH2	05/31/16	09/23/16	21	1.0	2.3	1.8
BBC_SH2	05/31/17	09/12/17	22	1.0	2.2	1.8
BBC_SH2	06/11/18	09/20/18	19	1.4	2.2	1.8
BBC_SH2	05/30/19	09/22/19	23	1.3	2.5	1.9
BBC_SH3A	05/29/15	09/24/15	30	0.3	3.0	1.6
BBC_SH3A	03/08/16	09/26/16	25	1.3	2.8	1.9
BBC_SH3A	01/09/17	09/19/17	24	1.0	2.7	1.8
BBC_SH3A	06/06/18	08/21/18	13	1.2	2.0	1.6
BBC_SH3A	06/05/19	09/24/19	18	0.7	2.2	1.6

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_SH1	06/16/15	09/24/15	0.2	8	0.010	0.065	0.034
BBC_SH1	01/06/16	09/26/16	0.2	10	0.004	0.046	0.013
BBC_SH1	01/09/17	09/19/17	0.2	10	0.007	0.072	0.034
BBC_SH1	07/10/18	08/21/18	0.2	4	0.004	0.037	0.017
BBC_SH1	07/11/19	08/15/19	0.2	4	0.004	0.041	0.013
BBC_SH2	07/13/15	08/25/15	0.2	4	0.010	0.014	0.012
BBC_SH2	08/10/15	08/10/15	2.5	1	0.017	0.017	0.017
BBC_SH2	07/05/16	08/15/16	0.2	4	0.005	0.016	0.009
BBC_SH2	07/05/16	08/15/16	2.5	4	0.004	0.022	0.009
BBC_SH2	07/06/17	08/17/17	0.2	4	0.004	0.012	0.007
BBC_SH2	07/06/17	08/17/17	2.4	4	0.004	0.010	0.006
BBC_SH2	07/10/18	08/21/18	0.2	4	0.004	0.004	0.004
BBC_SH2	07/10/18	08/21/18	1.8	4	0.004	0.007	0.005
BBC_SH2	07/11/19	08/15/19	0.2	4	0.004	0.032	0.012
BBC_SH3A	06/16/15	09/24/15	0.2	8	0.004	0.013	0.008
BBC_SH3A	01/06/16	09/26/16	0.2	10	0.004	0.011	0.006
BBC_SH3A	01/09/17	09/19/17	0.2	10	0.004	0.012	0.007
BBC_SH3A	07/10/18	08/21/18	0.2	4	0.004	0.017	0.007
BBC_SH3A	07/11/19	08/15/19	0.2	4	0.004	0.004	0.004

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Inner Sippican Harbor (MA95-70); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>"Inner" Sippican Harbor (MA95-70): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.5474 sq mi (96%). The approved shellfish growing area represents 0.1256 sq mi (22%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.</p>	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB32.0	Sippican Outer Harbor	Approved	0.08900	15.6%
BB32.01	Point Road/Hammett's Cove	Approved	0.03656	6.4%
BB32.11	57 Water Street	Prohibited	0.00060	0.1%
BB32.13	Sippican Inner Harbor Mooring Area	Conditionally Approved	0.40341	70.7%
BB32.15	Burr Brothers Boat Yard	Prohibited	0.01066	1.9%
BB32.6	Barden's Boat Yard	Prohibited	0.00658	1.2%
BB32.9	Holmes Brook	Prohibited	0.00062	0.1%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Inner Sippican Harbor (MA95-70) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There are three beaches in Inner Sippican Harbor, all located on the west bank of the harbor in Marion (MA95-70); the names and ID codes for the beaches are as follows: Tabor Academy (ID 2950), Island Wharf (ID 2944) and Beverly Yacht (ID 5221). These beaches were usually never (or only rarely) posted for swimming between 2014 and 2019, with the greatest number of posts occurring at Beverly Yacht Beach in 2017 (8% of the bathing season posted). The Primary Contact Recreational Use for Inner Sippican Harbor (MA95-70) is assessed as Fully Supporting, since there were very few if any swimming advisory postings at the Tabor Academy, Island Wharf, and Beverly Yacht Beaches between 2014 and 2019.</p>	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2944	Island Wharf/Marion	41.70519	-70.76110	41.70478	-70.76100	2%	0%	1%	0%	0%	0%	0
2950	Tabor Academy/Marion	41.70808	-70.76450	41.70770	-70.76420	0%	0%	1%	0%	0%	0%	0
5221	Beverly Yacht/Marion	41.70343	-70.75940	41.70342	-70.75930	0%	0%	0%	8%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
"Inner" Sippican Harbor (MA95-70): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.5474 sq mi (96%). The approved shellfish growing area represents 0.1256 sq mi (22%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There are three beaches in Inner Sippican Harbor, all located on the west bank of the harbor in Marion (MA95-70); the names and ID codes for the beaches are as follows: Tabor Academy (ID 2950), Island Wharf (ID 2944) and Beverly Yacht (ID 5221). These beaches were usually never (or only rarely) posted for swimming between 2014 and 2019, with the greatest number of posts occurring at Beverly Yacht Beach in 2017 (8% of the bathing season posted). The Secondary Contact Recreational Use for Inner Sippican Harbor (MA95-70) is assessed as Fully Supporting, since there were very few if any swimming advisory postings at the Tabor Academy, Island Wharf, and Beverly Yacht Beaches between 2014 and 2019.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
"Inner" Sippican Harbor (MA95-70): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.5474 sq mi (96%). The approved shellfish growing area represents 0.1256 sq mi (22%). Because the total of all shellfish growing area classifications is anything less than "approved", the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Abner Pond (MA95001)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	9 ACRES
Classification/Qualifier:	B

No usable data were available for Abner Pond (MA95001) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

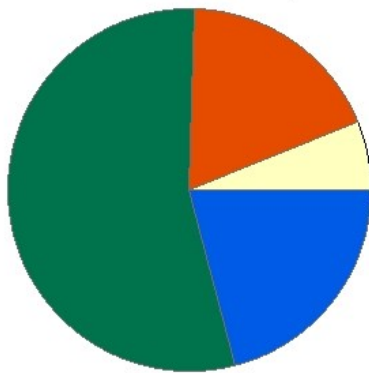
2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Acushnet River (MA95-31)

Location:	Headwaters, outlet New Bedford Reservoir, Acushnet to Hamlin Street culvert, Acushnet.
AU Type:	RIVER
AU Size:	2.9 MILES
Classification/Qualifier:	B: WWF, HQW

Acushnet River - MA95-31

Watershed Area: 16.35 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	16.35	9.09	5.78	2.62
Agriculture	6.1%	6.1%	10%	9.2%
Developed	18.5%	20.9%	12.3%	15.4%
Natural	54.4%	52%	47.7%	47.8%
Wetland	21%	21%	30%	27.6%
Impervious Cover	6.1%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Dissolved Oxygen		Unchanged
5	5	Enterococcus	36170	Unchanged
5	5	Escherichia Coli (E. Coli)	36170	Unchanged
5	5	Fecal Coliform	36170	Unchanged
5	5	Nutrients		Removed

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Source Unknown (N)	X				
Enterococcus	Agriculture (N)				X	
Enterococcus	Discharges from Municipal Separate Storm Sewer Systems (MS4) (N)				X	
Enterococcus	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (N)				X	
Enterococcus	Unspecified Urban Stormwater (N)				X	
Escherichia Coli (E. Coli)	Agriculture (N)				X	

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Escherichia Coli (E. Coli)	Discharges from Municipal Separate Storm Sewer Systems (MS4) (N)				X	
Escherichia Coli (E. Coli)	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (N)				X	
Escherichia Coli (E. Coli)	Unspecified Urban Stormwater (N)				X	
Fecal Coliform	Agriculture (N)				X	
Fecal Coliform	Discharges from Municipal Separate Storm Sewer Systems (MS4) (N)				X	
Fecal Coliform	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (N)				X	
Fecal Coliform	Unspecified Urban Stormwater (N)				X	

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Nutrients	Applicable WQS attained; reason for recovery unspecified	The original cause "Other" was related to unspecified nutrients as part of the 1992 listing cycle. The documentation of that decision is poor and the WBS code identified was "Nutrients". Since there were no observations of enriched conditions based on the physico-chemical and field observations during MassDEP 2005 or 2016 summer surveys at stations sampled by MassDEP staff along this Acushnet River AU (MA95-31) (i.e., from up to downstream sampling sites W1382, W2644, and W1381), the "Nutrients" cause is being removed.

Nutrients

Information supporting the removed impairment

1997 WBS Coding Sheet (MassDEP 2002):

MA95-31 Acushnet River (9559625) Size: 2.70M, R Class: B/WWF

Outlet New Bedford Reservoir to Hamlin Road culvert.

Assessment Date: 9112 Begin Sampling: 8610 Toxics Monitored: N
 Cycle: 92 End Sampling: 8610 Assessment Category: Evaluated

Uses	Support	Threat	Partial	Non-Sup	Not-Asses
Overall Use Support	1.0			1.7	
Aquatic Life	1.0			1.7	
Fish Consumption					2.7
Warm Water Fishery					
Swimmable	1.0			1.7	
Secondary Contact Rec	1.0			1.7	
Aesthetics	1.0			1.7	
Dummy AL Bio					2.7
Dummy AL Chem	1.0			1.7	

Media/Pollutants Assessed Toxics Monitoring = > N

-

Assessment Type Assessment Category = > Evaluated

130 - Land use information and location of sources
 150 - Monit'g data more than 5 years old
 170 - Best professional judgement
 185 - Synoptic Surveys

Aquatic Contamination

-

<u>Nonattainment Causes</u>		<u>Nonattainment Sources</u>	
0900 - Nutrients	1.70 M	1800 - Animal holding/management areas	1.70 M
1100 - Siltation	1.70 M	6300 - Landfills	1.70 S
1200 - Organic enrichment/DO	1.70 H	6500 - Onsite wastewater systems (septic tanks)	1.70 M
1700 - Pathogens	1.70 M	4010 - Non-Urban Runoff	1.70 M

Comments:
 1992: The first mile from its outlet at the New Bedford receiver water quality is good. Below the 1.0 mile point the river receives via its tributaries and directly from nonpoint sources. Pollutants from unsewered sub-divisions, agricultural runoff, storm water and runoff from a landfill.

MassDEP staff conducted water quality sampling in this Acushnet River AU (MA95-31) at two sites during the summer of 2005: at Leonard Street (W1382) and Hamlin Street (W1381) in Acushnet (MassDEP Undated10). At the upstream station (W1382) the average total phosphorus was 0.053 mg/L (n=5) while the maximum total phosphorus was 0.16 mg/L. The 0.16 mg/L total phosphorus sample occurred on 8/30/15 during an extreme wet weather event (~7.5 inches of rain fell in New Bedford on 8/29 and 8/30). No observations of dense or very dense filamentous algae were noted during any of the surveys. The maximum daily DO shift was 1 and the maximum DO saturation was 90%. Further downstream (W1381) the average total phosphorus was 0.041 mg/L (n=4) while the maximum total phosphorus was 0.065 mg/L. No observations of dense or very dense filamentous algae were noted. The maximum daily DO shift was 3.5 and the maximum DO saturation was 93%.

Observations of Filamentous Algae at MassDEP Stations (2005) (MassDEP Undated11)

Unique ID	Name	Year	Fieldsheets	Filamentous Dense or Very Dense
W1382	ACUSHNET RIVER	2005	6	0
W1381	ACUSHNET RIVER	2005	5	0

MassDEP Aesthetics Observations (2005) (MassDEP Undated11)

UNIQ UE_ID	DATE	Field Sheet Time	Odor Name	Clarity Name	Color Name	Scum	Objectionabl e Deposit	Objectionable Deposit Description
W138 2	5/2/2 005	1142	None	Clear	Light Yellow/T an	Not Applicable (N/A)	Not Applicable (N/A)	

W138 2	5/3/2 005	1057	None	Clear	Reddish	No	No	
W138 2	5/31/ 2005	1515	None	Clear	Light Yellow/T an	Not Applicable (N/A)	Not Applicable (N/A)	
W138 2	6/9/2 005	1017	None	Clear	Reddish	No	No	
W138 2	6/27/ 2005	-8	None	Slightly Turbid	Clear	Not Applicable (N/A)	Not Applicable (N/A)	
W138 2	6/28/ 2005	1029	None	Clear	Reddish	No	No	
W138 2	8/1/2 005	1238	None	Clear	Light Yellow/T an	Not Applicable (N/A)	Not Applicable (N/A)	
W138 2	8/2/2 005	1048	None	Clear	Reddish	No	No	
W138 2	8/26/ 2005	1215	Swampy or Plant	Slightly Turbid	Light Yellow/T an	Not Applicable (N/A)	Not Applicable (N/A)	
W138 2	8/30/ 2005	1040	None	Un- Observabl e	Un- Observabl e	No	No	
W138 2	9/12/ 2005	1149	None	Clear	Clear	No	No	
W138 2	9/12/ 2005	1149	None	Clear	Clear	No	No	
W138 1	6/9/2 005	1038	None	Moderatel y Turbid	Reddish	Yes	Yes	Fish pieces and geese droppings.
W138 1	6/28/ 2005	1051	None	Moderatel y Turbid	Reddish	No	No	
W138 1	8/2/2 005	1108	None	Moderatel y Turbid	Reddish	No	Yes	Oils released from sediment bottom when stepped on.
W138 1	8/26/ 2005	1154	None	Moderatel y Turbid	Brownish	Not Applicable (N/A)	Not Applicable (N/A)	
W138 1	9/12/ 2005	1141	None	Slightly Turbid	Rusty (orangish)	No	No	

MassDEP staff conducted water quality sampling in this Acushnet River AU (MA95-31) at two sites during the summer of 2016: at Leonard Street in Acushnet (W1382) and farther downstream at the unnamed road crossing ~5500 feet south of Leonard Street in Acushnet (W2644) (n=3 both sites). There were generally no noted objectionable conditions (odors, deposits, growths) recorded by MassDEP field sampling crews at either site although there were three observations of moderate turbidity at W1382.

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W1382	2016	3	2	0
W2644	2016	3	3	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W1382	Acushnet River	2016	Color	None	3	3
W1382	Acushnet River	2016	Objectionable Deposits	Not Applicable (N/A)	3	3
W1382	Acushnet River	2016	Odor	None	3	3
W1382	Acushnet River	2016	Scum	Not Applicable (N/A)	3	3
W1382	Acushnet River	2016	Turbidity	Moderately Turbid	3	3
W2644	Acushnet River	2016	Color	None	3	3
W2644	Acushnet River	2016	Objectionable Deposits	Not Applicable (N/A)	3	3
W2644	Acushnet River	2016	Odor	Musty (Basement)	1	3
W2644	Acushnet River	2016	Odor	None	2	3
W2644	Acushnet River	2016	Scum	Not Applicable (N/A)	3	3
W2644	Acushnet River	2016	Turbidity	Moderately Turbid	1	3
W2644	Acushnet River	2016	Turbidity	Slightly Turbid	2	3

Recommendations

2022 Recommendations
REC: Conduct additional bacteria sampling/analysis for Acushnet River (MA95-31) to better evaluate if the river should be impaired for <i>E. coli</i> .

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

MassDFG biologists conducted backpack electrofishing at one site along this Acushnet River AU (MA95-31) during the summer of 2017, just downstream of an unnamed road crossing ~5500 feet south of Leonard Street in Acushnet (SampleID 6450). The sample collected in this low-moderate gradient habitat reach consisted of two fluvial species comprising 23% of the sample, namely creek chubsucker and tessellated darter as well as a number of tolerant macrohabitat generalists. DMF biologists note two potential barriers providing adequate passage to diadromous fish throughout this Acushnet River AU. The targeted species at both locations are river herring and American eel with a population score of "5". From upstream to downstream: The New Bedford Reservoir Dam (NATID# MA01014) (with existing fishway) was given a passage score of "2" on a 0-10 scale (minor obstruction). It was noted that passage was adequate at this dam and only future maintenance was recommended. The Hamlin Street Dam (NATID# MAMA01153) (with existing fishway), located at the downstream end of the AU at Hamlin Street, was given a passage score of "1" (minor obstruction). DMF noted that a passage improvement project occurred at this dam in 2007/2008 and that there is ongoing DMF eel and herring monitoring occurring in this watershed. Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at one location in the summers of 2015-2019, at the downstream end of the AU at Hamlin Street (BBC_ARH). Monitoring was conducted in the surface waters, as well as deeper in the water column in 2017 (depth of ~0.4m) and was usually conducted weekly in the summer months (between 6 & 9am). The maximum temperature was 28.5°C, just once being greater than the WW criterion (>28.3°C)(n=89). The minimum dissolved oxygen (DO) was 4.1mg/L (n=59), <5.0mg/L only three times between May and July (when anadromous fish early life stages are potentially present). Nutrient sampling efforts (in July and August) documented seasonal average total phosphorus concentrations between 0.012-0.019mg/L (n=19, maximum 0.025mg/L). The maximum chlorophyll *a* was 10.48µg/L (n=18). Ammonia-nitrogen concentrations were generally low (range 0.012 to 0.044mg/L (n=19)), though TUs could not be calculated (lack of quality assured pH and salinity data). MassDEP staff did not observe any dense film or filamentous algae at Leonard Street (W1382) or at an unnamed road crossing/private drive ~5500 feet south of Leonard Street (W2644) during summer surveys in 2016 (n=2 and 3 respectively). The Aquatic Life Use for this Acushnet River AU (MA95-31) will continue to be assessed as Not Supporting based on the water quality data collected by the BBC staff/volunteers in 2015-2019, with the Dissolved Oxygen impairment being carried forward. Since there were no observations of enriched conditions based on the physico-chemical and field observations during the 2005 or 2016 summer surveys conducted by MassDEP staff, or BBC staff/volunteers in the summers of 2015-2019, the "Nutrients" cause is being removed (see justification in removal comments).

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
6450	MassDFG	Fish Community	Acushnet River	At Pine Hill Inne Rd xing, Acushnet	41.71313	-70.90435
W1382	MassDEP	Water Quality	Acushnet River	[Leonard Street, Acushnet]	41.724499	-70.897769
W2644	MassDEP	Water Quality	Acushnet River	[unnamed road crossing approximately 5500 feet south of Leonard Street, Acushnet]	41.713055	-70.903629

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_ARH	Buzzards Bay Coalition	Water Quality	Acushnet River	Acushnet River Fresh, Acushnet	41.696408	-70.914166

Biological Monitoring Information

Fish Community Data and DELTS

Fish Community Data (2012-2019) Provided by MassDFG. (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net, Gradient: H = High, L = Low; I/MT MG= Intolerant/Moderately Tolerant Macrohabitat Generalist]

[Species List: AE = American Eel, B = Bluegill, BB = Brown Bullhead, CCS = Creek Chubsucker, GS = Golden Shiner, TD = Tessellated Darter]

Sample ID	Sample Date	Method	Sample Type	Gradient	Total Taxa	Total Ind	Cold Ind %	Fluvial Taxa	Fluvial Ind %	Intol Ind %	I/MT MG Taxa	I/MT MG Ind %	Notables	CFR	Species List
6450	06/22/17	BP	TP		6	43	0%	2	23%	2%	0	0%	No	No	AE, B, BB, CCS, GS, TD,

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note two potential barriers providing adequate passage to diadromous fish throughout this Acushnet River AU. The targeted species at both locations are river herring and American eel with a population score of "5". From upstream to downstream: The New Bedford Reservoir Dam (NATID# MA01014) (with existing fishway) was given a passage score of "2" on a 0-10 scale (minor obstruction). It was noted that passage was adequate at this dam and only future maintenance was recommended. The Hamlin Street Dam (NATID# MAMA01153) (with existing fishway), located at the downstream end of the AU at Hamlin Street, was given a passage score of "1" (minor obstruction). DMF noted that a passage improvement project occurred at this dam in 2007/2008 and that there is ongoing DMF eel and herring monitoring occurring in this watershed.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Freshwater Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Average Sample depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
BBC_ARH	06/04/15	06/11/15	0.1	2	4.5	5.8	1	1	0
BBC_ARH	06/30/16	08/31/16	0.1	3	4.1	4.4	3	2	0
BBC_ARH	06/11/17	06/11/17	0.1	1	7.0	7.0	0	0	0
BBC_ARH	06/18/17	09/21/17	0.4	18	4.5	5.8	1	0	0
BBC_ARH	06/10/18	09/01/18	0.2	14	5.0	6.0	0	0	0
BBC_ARH	05/30/19	09/23/19	0.2	21	5.0	6.6	0	0	0

Buzzards Bay Coalition Discrete Freshwater Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_ARH	06/04/15	09/14/15	0.1	26	26	28.5	20.0	11	3	1	0
BBC_ARH	06/30/16	08/31/16	0.1	7	7	28.0	23.8	7	5	0	0
BBC_ARH	06/11/17	08/17/17	0.1	5	5	26.6	22.2	4	3	0	0
BBC_ARH	06/18/17	09/21/17	0.4	18	16	24.0	19.7	7	3	0	0
BBC_ARH	06/10/18	09/01/18	0.2	15	15	24.8	20.9	9	5	0	0
BBC_ARH	05/30/19	09/23/19	0.2	23	20	25.0	21.2	13	8	0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

MassDEP Nutrient Enrichment Indicator Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	Delta DO Max (mg/L)	Delta DO Avg (mg/L)	DO Sat Max (%)	pH Max (SU)	Count Algal Obsv.	Dense/V. Dense Film/Fila. Algae
W1382	2016	--	--	--	--	--	--	--	--	2	0
W2644	2016	--	--	--	--	--	--	--	--	3	0

Buzzards Bay Coalition Freshwater Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	DO Sat Max (%)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count >16µg/L
BBC_ARH	2015	0.2	4	0.009	0.025	0.019	--	4	2.94	4.98	3.63	0
BBC_ARH	2016	0.2	4	0.008	0.015	0.012	--	4	1.47	6.66	3.55	0
BBC_ARH	2017	0.2	4	0.015	0.015	0.015	--	4	1.15	10.48	3.59	0
BBC_ARH	2018	0.2	4	0.015	0.015	0.015	--	4	1.21	3.14	1.94	0
BBC_ARH	2019	0.2	3	0.011	0.017	0.014	--	2	1.25	1.61	1.43	0

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_ARH	07/13/15	08/25/15	0.2	4	0.028	0.043	0.036
BBC_ARH	07/05/16	08/15/16	0.2	4	0.015	0.036	0.027
BBC_ARH	07/06/17	08/17/17	0.2	4	0.023	0.044	0.030
BBC_ARH	07/10/18	08/21/18	0.2	4	0.012	0.021	0.018

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_ARH	07/25/19	08/15/19	0.2	3	0.017	0.023	0.020

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Acushnet River AU (MA95-31); therefore the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	
<p>MassDEP staff conducted water quality sampling in this Acushnet River AU (MA95-31) at two sites during the summer of 2016. The stations are described as follows: on Leonard Street in Acushnet (W1382) and farther downstream at the unnamed road crossing ~5500 feet south of Leonard Street in Acushnet (W2644) (n=3 both sites). There were generally no noted objectionable conditions (odors, deposits, growths) recorded by MassDEP field sampling crews at either site although there were three observations of moderate turbidity at W1382.</p> <p>The Aesthetics Use for this Acushnet River AU (MA95-31) is assessed as Fully Supporting. An Alert is being identified due to observations of moderate turbidity at Leonard Street. Since there were no observations of nutrient-related enrichment noted by MassDEP staff during the 2005 or 2016 summer surveys, the "Nutrients" impairment is being removed (see justification in removal comments).</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1382	MassDEP	Water Quality	Acushnet River	[Leonard Street, Acushnet]	41.724499	-70.897769
W2644	MassDEP	Water Quality	Acushnet River	[unnamed road crossing approximately 5500 feet south of Leonard Street, Acushnet]	41.713055	-70.903629

Aesthetic Observations

Aesthetics Summary Statements for MassDEP Stations (2011-2018) (MassDEP Undated6)

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W1382	Acushnet River	2016	3	MassDEP aesthetics observations for station W1382 on the Acushnet River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths) recorded by DEP field sampling crews during summer 2016. However, the use is identified with an Alert status since there were 3 observations of moderate turbidity.

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W2644	Acushnet River	2016	3	MassDEP aesthetics observations for station W2644 on Acushnet River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2016.

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W1382	2016	3	2	0
W2644	2016	3	3	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W1382	Acushnet River	2016	Color	None	3	3
W1382	Acushnet River	2016	Objectionable Deposits	Not Applicable (N/A)	3	3
W1382	Acushnet River	2016	Odor	None	3	3
W1382	Acushnet River	2016	Scum	Not Applicable (N/A)	3	3
W1382	Acushnet River	2016	Turbidity	Moderately Turbid	3	3
W2644	Acushnet River	2016	Color	None	3	3
W2644	Acushnet River	2016	Objectionable Deposits	Not Applicable (N/A)	3	3
W2644	Acushnet River	2016	Odor	Musty (Basement)	1	3
W2644	Acushnet River	2016	Odor	None	2	3
W2644	Acushnet River	2016	Scum	Not Applicable (N/A)	3	3
W2644	Acushnet River	2016	Turbidity	Moderately Turbid	1	3
W2644	Acushnet River	2016	Turbidity	Slightly Turbid	2	3

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

MassDEP staff collected *E. coli* bacteria samples in this Acushnet River AU (MA95-31) at Leonard Street in Acushnet (W1382) between July and September 2016 (n=3), UMass Dartmouth volunteers collected *Enterococci* bacteria samples also at Leonard Street (UMassD_3) between June and September 2019 (n=16), and further downstream MassDEP staff collected *E. coli* bacteria samples at an unnamed road crossing/private drive ~5500 feet south of Leonard Street (W2644) between July and September 2016 (n=3). Data analysis indicated that none of the intervals at site W1382 or site W2644 had GM's >126 cfu/100 ml and no samples exceeded the 410 cfu/100 ml STV for *E. coli* at either site, with seasonal GM's of 118 and 99 cfu/100ml respectively. However, analysis of the single years' worth of high frequency *Enterococci* data at UMassD_3 indicated 92% of intervals had GMs >35 cfu/100ml and 25% of samples exceeded the 130 cfu/100ml STV. The Primary Contact Recreational Use for this Acushnet River AU (MA95-31) will continue to be assessed as Not Supporting since elevated *Enterococci* concentrations were documented by UMass Dartmouth volunteers at Leonard Street, Acushnet in 2019 so the *Enterococci* impairment is being carried forward. Considering the continuing impairment for *Enterococci* and only a limited *E. coli* dataset that do not exceed the Use Attainment Impairment Decision Schema, the *E. coli* impairment will not be delisted at this time and the *E. coli* and Fecal coliform impairments are also being carried forward. Since there were no observations of nutrient-related enrichment noted by MassDEP staff during the 2005 or 2016 summer surveys, the "Nutrients" impairment is being removed (see justification in removal comments).

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1382	MassDEP	Water Quality	Acushnet River	[Leonard Street, Acushnet]	41.724499	-70.897769
W2644	MassDEP	Water Quality	Acushnet River	[unnamed road crossing approximately 5500 feet south of Leonard Street, Acushnet]	41.713055	-70.903629
UMassD_3	UMass Dartmouth	Water Quality	Acushnet River Upstream	216 Leonard Street, Acushnet, MA.	41.724418	-70.897757

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP Undated11) (MassDEP Undated6) (UMass-Dartmouth 2019) (MassDEP Undated4)
 [Result units are CFU/100ml or MPN/100ml]

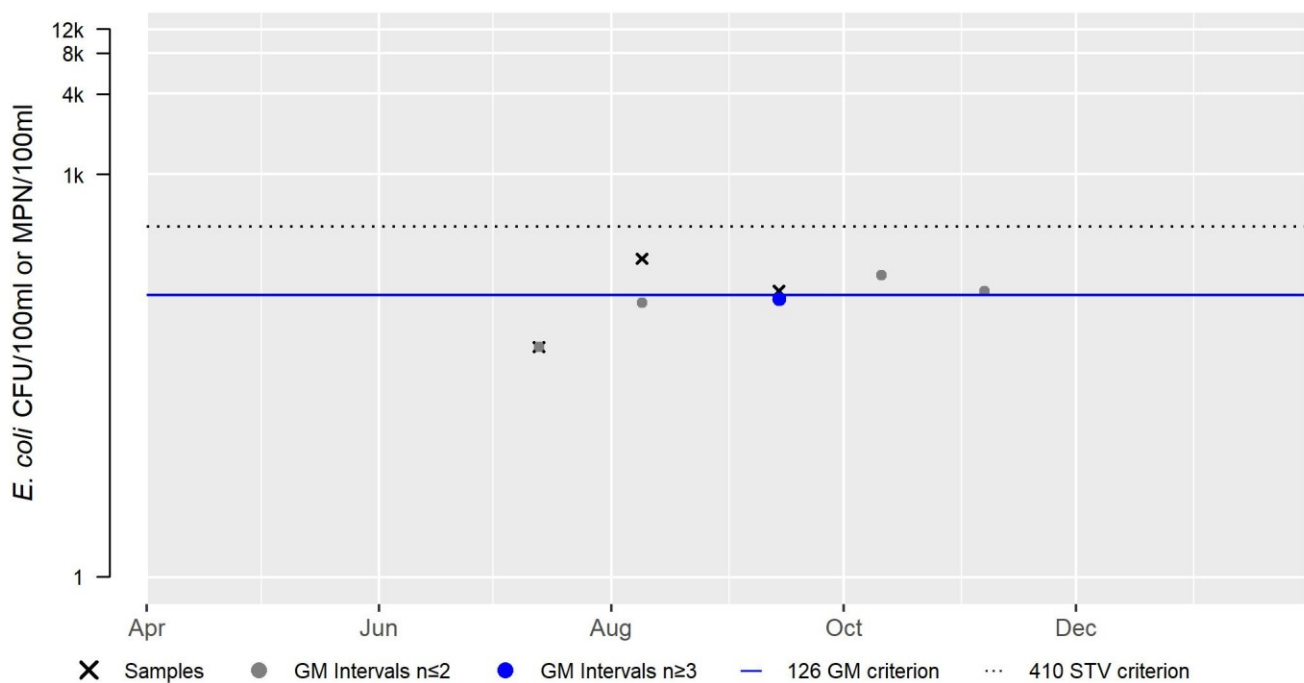
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
W1382	MassDEP	<i>E. coli</i>	07/13/16	09/14/16	3	52	236	118
W2644	MassDEP	<i>E. coli</i>	07/13/16	09/14/16	3	33	387	99
UMassD_3	UMass Dartmouth	<i>Enterococci</i>	06/13/19	09/23/19	16	1	359	58

W1382 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	118
#GMI	1
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2016

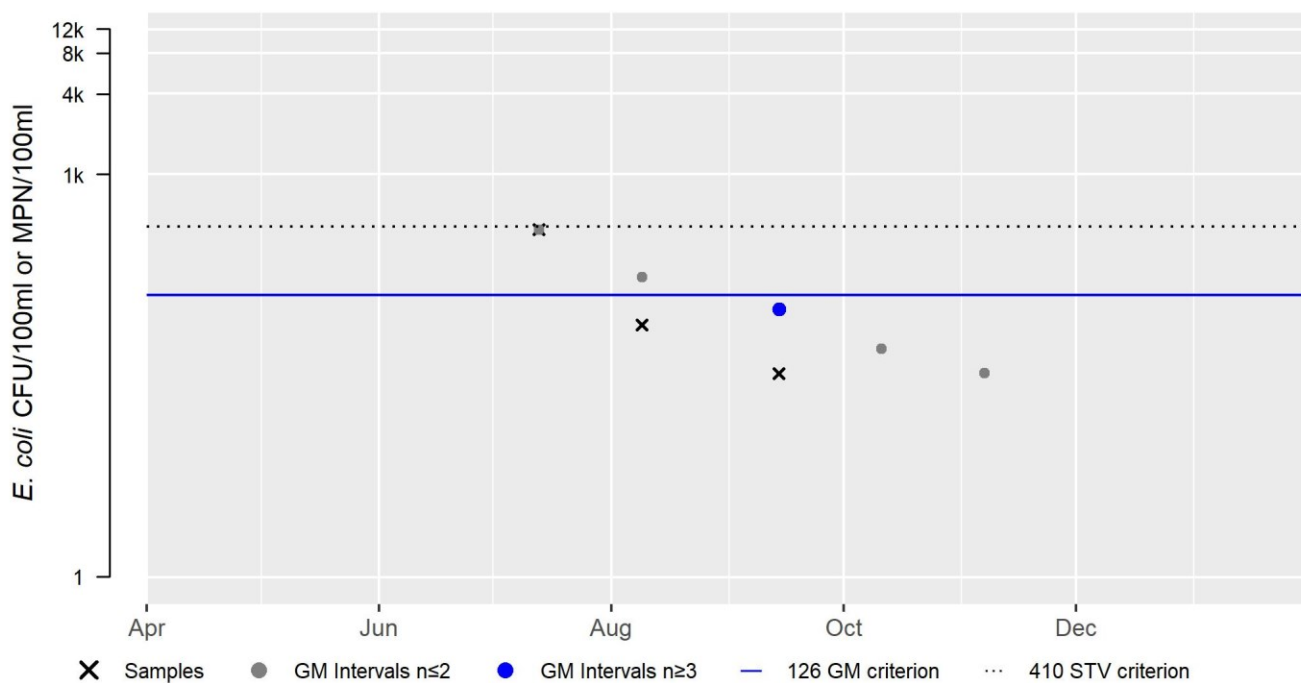


W2644 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	99
#GMI	1
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2016

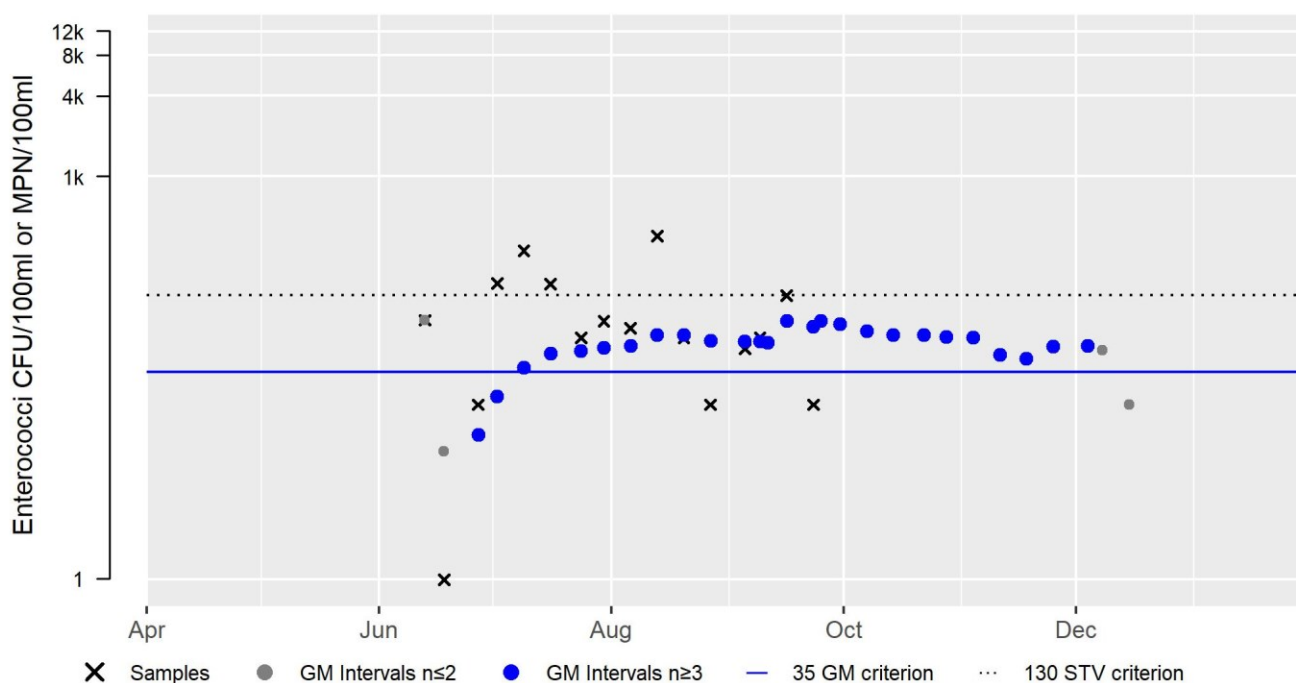


UMassD_3 Enterococci (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	16
SeasGM	58
#GMI	26
#GMI Ex	24
%GMI Ex	92
n>STV	4
%n>STV	25

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2019



Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff collected <i>E. coli</i> bacteria samples in this Acushnet River AU (MA95-31) at Leonard Street in Acushnet (W1382) between July and September 2016 (n=3) and at an unnamed road crossing ~5500 feet south of Leonard Street (W2644) between July and September 2016 (n=3). Data analysis indicated that none of the intervals had GM's >630 cfu/100 ml and none of the samples exceeded the 1260 cfu/100 ml STV. The seasonal GM's were 118 and 99 cfu/100 ml from upstream to downstream, respectively.</p> <p>Since the <i>E.coli</i> data did not exceed the use attainment impairment thresholds for either of the single year limited frequency datasets, the Secondary Contact Recreational Use for this Acushnet River AU (MA95-31) is assessed as Fully Supporting. Since there were no observations of nutrient-related enrichment noted by MassDEP staff during the 2005 or 2016 summer surveys, the "Nutrients" impairment is being removed (see justification in removal comments).</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1382	MassDEP	Water Quality	Acushnet River	[Leonard Street, Acushnet]	41.724499	-70.897769
W2644	MassDEP	Water Quality	Acushnet River	[unnamed road crossing approximately 5500 feet south of Leonard Street, Acushnet]	41.713055	-70.903629

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP Undated11) (MassDEP Undated6)

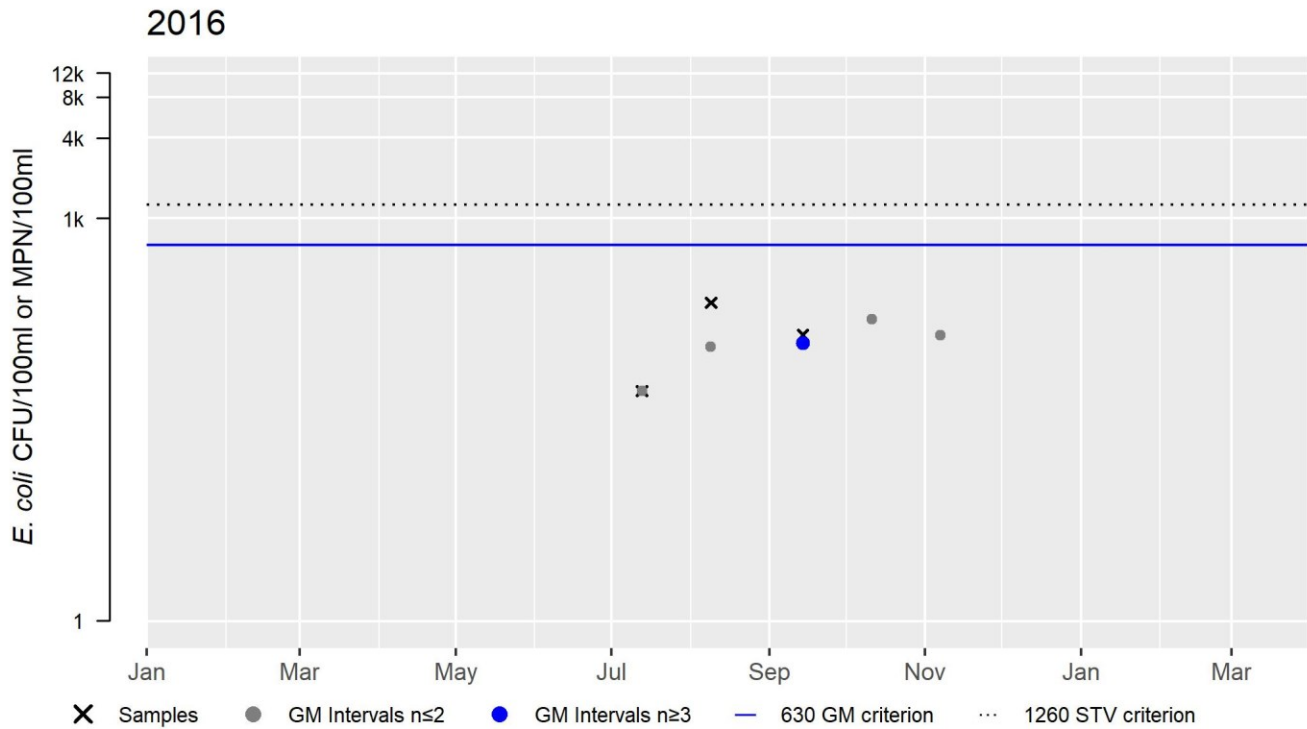
[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
W1382	MassDEP	E. coli	07/13/16	09/14/16	3	52	236	118
W2644	MassDEP	E. coli	07/13/16	09/14/16	3	33	387	99

W1382 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	118
#GMI	1
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

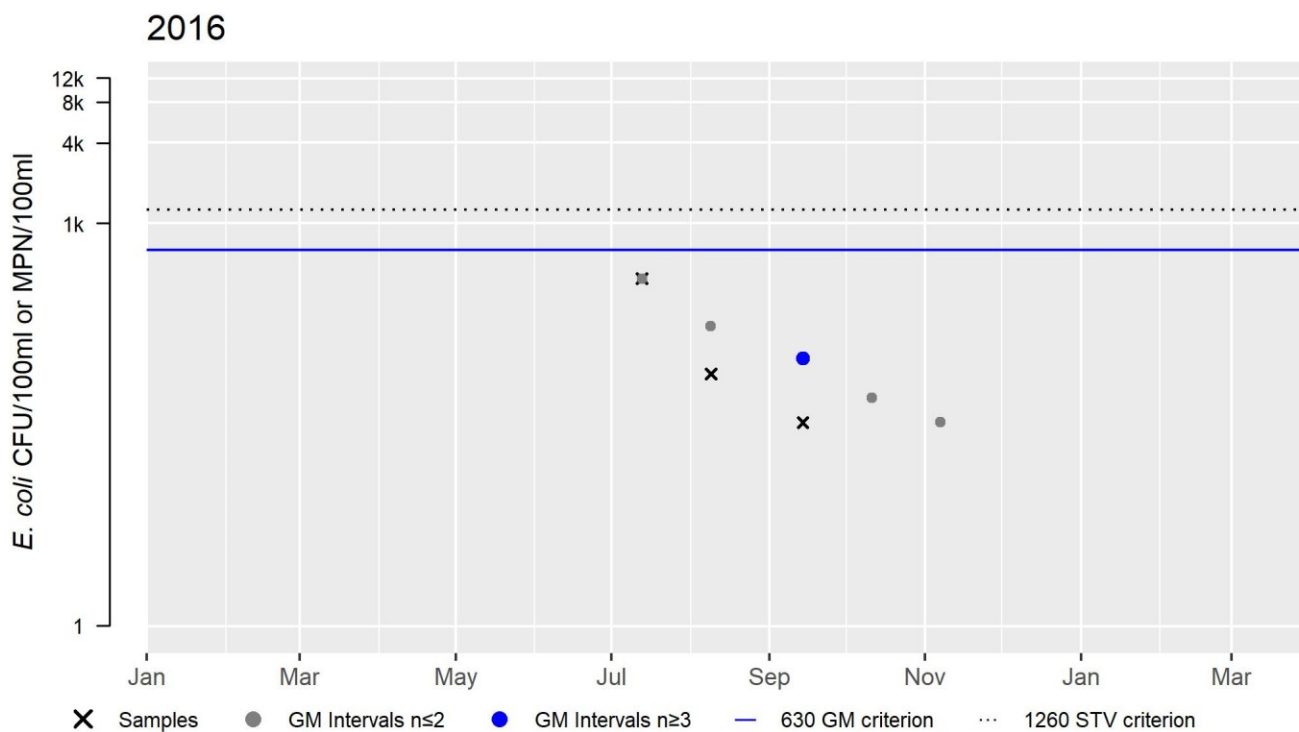
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2644 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	99
#GMI	1
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

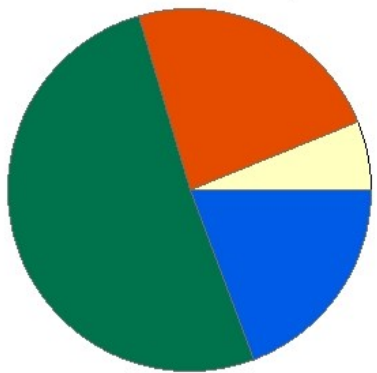


Acushnet River (MA95-32)

Location:	Hamlin Street culvert, Acushnet to culvert at Main Street, Acushnet.
AU Type:	RIVER
AU Size:	1.1 MILES
Classification/Qualifier:	B: WWF, HQW

Acushnet River - MA95-32

Watershed Area: 18.67 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	18.67	8.36	6.45	2.48
Agriculture	6.1%	4.8%	10%	7.2%
Developed	23.4%	31.2%	14.1%	18%
Natural	51.3%	45.7%	47.2%	47.9%
Wetland	19.2%	18.3%	28.7%	26.8%
Impervious Cover	9%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Benthic Macroinvertebrates		Unchanged
5	5	Dissolved Oxygen		Unchanged
5	5	Enterococcus	36170	Unchanged
5	5	Escherichia Coli (E. Coli)	36170	Unchanged
5	5	Fecal Coliform	36170	Unchanged
5	5	Nutrients		Removed

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Benthic Macroinvertebrates	Source Unknown (N)	X				
Dissolved Oxygen	Source Unknown (N)	X				
Enterococcus	Combined Sewer Overflows (N)				X	
Enterococcus	Discharges from Municipal Separate Storm Sewer Systems (MS4) (N)				X	
Escherichia Coli (E. Coli)	Combined Sewer Overflows (N)				X	X

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Escherichia Coli (E. Coli)	Discharges from Municipal Separate Storm Sewer Systems (MS4) (N)				X	X
Fecal Coliform	Combined Sewer Overflows (N)				X	X
Fecal Coliform	Discharges from Municipal Separate Storm Sewer Systems (MS4) (N)				X	X

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Nutrients	Applicable WQS attained; reason for recovery unspecified	The original cause "Other" was related to unspecified nutrients as part of the 1992 listing cycle. The documentation of that decision is poor and the WBS code identified was "Nutrients". Since there was only one observation of dense/very dense film or filamentous algae based on all the physico-chemical and field observations during any of the MassDEP 2005, 2016, and 2018 summer surveys at the four sites sampled along this Acushnet River AU (MA95-32) (i.e., from up to downstream sampling sites W1381, W2643, W2840, and W1380), the "Nutrients" cause is being removed.

Nutrients

Information supporting the removed impairment (MassDEP 2002)

WBID:	MA95-32	WATERSHED:	Buzzards Bay(95)	(Printed 05/13/94)
NAME:	Acushnet River	TYPE:	River	
CODE:	9559625	SIZE:	1.00(miles)	CLASS: B/WWF
				ORW?: Yes or No
				Water Supply?: Yes or No

Description: Hamlin Road to culvert at Main Street.

Assessment Date:	9112	Begin Sampling:	8610	Water Quality Limited?:	YES or NO
Cycle:	94	End Sampling:	8610	303(d) List?:	YES or NO

Uses	Support	Threat	Partial	Non-Sup	Not-Asses	Not-Attain
OVERALL USE SUPPORT				1.00		
ALUS				1.00		
FISH CONSUMPTION					1.00	
PRIMARY CONTACT				1.00		
SECONDARY CONTACT				1.00		
Aesthetics				1.00		
ALUS Bio					1.00	
ALUS Chem/Phys				1.00		

Nonattainment Causes			1996		
Code	Size	Magnitude	Code	Size	Magnitude
0900- Nutrients	1.00	M			
1200- Organic enrichment/Low DO	1.00	M			
1700- Pathogens	1.00	H			

Nonattainment Sources			1996		
Code	Size	Magnitude	Code	Size	Magnitude
0400- COMBINED SEWER OVERFLOW	1.00	M			
4000- URBAN RUNOFF/STORM SEWERS	1.00	M			
6000- LAND DISPOSAL	1.00	M			
6500- Onsite Wastewater Systems (Septic Tanks)	1.00	M			

Assessment Type	1996 Assessment Category = > M E NA
(Assessment Category = > Evaluated)	

Media/Pollutants Assessed	(Toxics Monitoring = > N)	1996 Toxics Monitoring = > YES or NO
-		

Comments:
1992:
This stretch of the river is heavily impacted by runoff from unsewered sub-division, urbanized land uses, a CSO.

MassDEP staff conducted water quality sampling in this Acushnet River AU (MA95-32) at two sites during the summer of 2005 (MassDEP Undated10): Hamlin Street in Acushnet (W1381) and upstream Tarkiln Hill Rd/Main St in New Bedford/Acushnet (W1380). At the upstream site the average total phosphorus was 0.041 mg/L (n=4) while the maximum total phosphorus was 0.065 mg/L. No observations of dense or very dense filamentous algae were noted during any of the surveys. The maximum daily DO shift was 3.5 and the maximum DO saturation was 93%. Further downstream (W1380) the average total phosphorus was 0.1 mg/L (n=4) while the maximum total phosphorus was 0.23 mg/L. The 0.23 mg/L total phosphorus sample occurred during an extreme wet weather event (rainfall in New Bedford for 8/30 was >5 inches). No observations of dense or very dense filamentous algae were noted. The maximum daily DO shift was 2.8 and the maximum DO saturation was 101%.

Observations of Filamentous Algae at MassDEP Stations (2005) (MassDEP Undated11)

Unique ID	Name	Year	Fieldsheets	Filamentous Dense or Very Dense
W1381	ACUSHNET RIVER	2005	5	0
W1380	ACUSHNET RIVER	2005	6	0

MassDEP Aesthetics Observations (2005) (MassDEP Undated11)

Unique ID	DATE	Field Sheet Time	Odor Name	Clarity Name	Color Name	Scum	Objectionable Deposit	Objectionable Deposit Description
W1381	6/9/2005	1038	None	Moderately Turbid	Reddish	Yes	Yes	Fish pieces and geese droppings.
W1381	6/28/2005	1051	None	Moderately Turbid	Reddish	No	No	
W1381	8/2/2005	1108	None	Moderately Turbid	Reddish	No	Yes	Oils released from sediment bottom when stepped on.
W1381	8/26/2005	1154	None	Moderately Turbid	Brownish	Not Applicable (N/A)	Not Applicable (N/A)	
W1381	9/12/2005	1141	None	Slightly Turbid	Rusty (orangish)	No	No	
W1380	5/3/2005	1135	None	Clear	Reddish	No	No	
W1380	5/31/2005	1445	None	Clear	Light Yellow/Tan	Not Applicable (N/A)	Not Applicable (N/A)	
W1380	6/9/2005	1051	None	Slightly Turbid	Reddish	No	Yes	Some geese droppings.
W1380	6/27/2005	1332	Musty (Basement)	Slightly Turbid	Light Yellow/Tan	Not Applicable (N/A)	Not Applicable (N/A)	
W1380	6/28/2005	1110	None	Clear	Reddish	No	Yes	Trash in stream.
W1380	8/1/2005	1209	None	Slightly Turbid	Clear	Not Applicable (N/A)	Not Applicable (N/A)	
W1380	8/2/2005	1130	None	Moderately Turbid	Brownish	No	Yes	Some trash in stream.
W1380	8/30/2005	1115	None	Highly Turbid	Brownish	No	No	
W1380	9/12/2005	1134	None	Slightly Turbid	Reddish	No	Yes	Trash.

MassDEP staff conducted water quality sampling in this Acushnet River AU (MA95-32) at three sites between the summers of 2016 and 2018: downstream Hamlin St, Acushnet (W2643), downstream Mill Rd, footbridge/Saw Mill Pond outlet, Acushnet (W2840), and at the downstream end of the AU just upstream at Tarkiln Hill Rd/Main St in New Bedford/Acushnet (W1380). MassDEP staff did not observe any dense film or filamentous algae at either of the two upstream sites in 2016 (n=3) or 2018 (n=1), respectively and there was one observation of dense film or filamentous algae in one of the two surveys at the most downstream sampling site in 2018.

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W1380	2018	2	2	1
W2643	2016	3	3	0
W2840	2018	2	1	0

Recommendations

2022 Recommendations

REC: Conduct additional bacteria sampling/analysis in this Acushnet River AU (MA95-32) to better evaluate need for *E. coli* impairments.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>DMF biologists note two potential barriers providing adequate passage to diadromous fish throughout this Acushnet River AU. The targeted species at both locations are river herring and American eel with a population score of "5". From upstream to downstream: The Hamlin Street Dam (NATID# MA01153) (with existing fishway), at Hamlin Street, was given a passage score of "1", on a 0-10 scale (minor obstruction). The Sawmill Dam at Mill Pond (NATID# MA03021) (with existing fishway), located close to the downstream end of the AU, was given a passage score of "1", (minor obstruction). DMF noted that passage improvement projects occurred at both these dams in 2007/2008 and that there is ongoing DMF eel and herring monitoring occurring in the watershed. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at one location in the summers of 2015-2019, close the downstream end of the AU in a stretch of water in Acushnet, known locally as "Acushnet River Sawmill Pond" (BBC_ARO). Monitoring was conducted in the surface waters, as well as deeper in the water column in 2017 and 2018 (average depths of ~0.3 and 0.5m, respectively) and was usually conducted weekly in the summer months (between 6 & 9am). The maximum temperature was 27°C (n=109). The minimum dissolved oxygen (DO) was 1.8mg/L (n=104), <5.0mg/L 11 times between May and July (when anadromous fish early life stages are potentially present), and 26 times overall measuring <4.0mg/L. Nutrient sampling efforts (in July and August n=19, maximum 0.024mg/L) documented seasonal average total phosphorus concentrations between 0.014-0.019mg/L. The maximum Chlorophyll <i>a</i> was 13.9µg/L (n=19). Ammonia-nitrogen concentrations were generally low (range 0.014 to 0.08mg/L (n=19)), though TUs could not be calculated (lack of quality assured pH and salinity data). MassDEP staff did not observe any dense film or filamentous algae ~120 ft downstream of Hamlin St, Acushnet (W2643), or downstream east of Mill Rd, footbridge downstream of Saw Mill Pond outlet, Acushnet (W2840), during summer surveys in 2016 (n=3) and 2018 (n=1) respectively; though one observation of dense film or filamentous algae was made at the downstream end of the AU just upstream at Tarkiln Hill Rd/Main St in New Bedford/Acushnet (W1380) in 2018 (n=2).</p> <p>The Aquatic Life Use for this Acushnet River AU (MA95-32) will continue to be assessed as Not Supporting based on the water quality data collected by the BBC staff/volunteers in 2015-2019, with the Dissolved Oxygen impairment being carried forward. The Benthic Macroinvertebrates impairment is also being carried forward. With one single exception there were no other observations of any enriched conditions based on the physico-chemical and field observations during the 2005, 2016, and 2018 summer surveys conducted by MassDEP staff so the "Nutrients" impairment is being removed (see justification in removal comments).</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1380	MassDEP	Water Quality	Acushnet River	[just upstream at Tarkiln Hill Road/Main Street, New Bedford/Acushnet]	41.681954	-70.918931
W2643	MassDEP	Water Quality	Acushnet River	[approximately 120 feet downstream of Hamlin Street, Acushnet]	41.695883	-70.914314
W2840	MassDEP	Water Quality	Acushnet River	[east of Mill Road, footbridge downstream of Saw Mill Pond outlet, Acushnet]	41.684081	-70.918984

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_ARO	Buzzards Bay Coalition	Water Quality	Acushnet River	Acushnet River Sawmill Pond, Acushnet	41.684545	-70.919456

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note two potential barriers providing adequate passage to diadromous fish throughout this Acushnet River AU. The targeted species at both locations are river herring and American eel with a population score of "5". From upstream to downstream: The Hamlin Street Dam (NATID# MA01153) (with existing fishway), at Hamlin Street, was given a passage score of "1", on a 0-10 scale (minor obstruction). The Sawmill Dam at Mill Pond (NATID# MA03021) (with existing fishway), located close to the downstream end of the AU, was given a passage score of "1", (minor obstruction). DMF noted that passage improvement projects occurred at both these dams in 2007/2008 and that there is ongoing DMF eel and herring monitoring occurring in the watershed.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Freshwater Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Average Sample depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
BBC_ARO	05/28/15	09/23/15	0.1	20	3.0	6.5	2	0	1
BBC_ARO	05/31/16	09/18/16	0.1	22	1.8	4.0	15	5	14
BBC_ARO	06/07/17	09/16/17	0.1	18	3.5	4.8	9	2	4
BBC_ARO	06/14/17	07/27/17	0.3	4	5.0	5.3	0	0	0
BBC_ARO	06/05/18	09/19/18	0.2	18	2.5	4.3	11	4	5
BBC_ARO	08/15/18	09/06/18	0.5	2	3.0	3.0	2	0	2
BBC_ARO	05/29/19	09/22/19	0.2	20	4.0	6.0	1	0	0

Buzzards Bay Coalition Discrete Freshwater Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_ARO	05/28/15	09/23/15	0.1	24	21	25.5	20.7	12	4	0	0
BBC_ARO	05/31/16	09/18/16	0.1	26	24	27.0	22.1	18	9	0	0
BBC_ARO	06/07/17	09/16/17	0.1	22	21	25.7	20.7	14	5	0	0
BBC_ARO	06/14/17	07/27/17	0.3	4	4	23.3	20.6	2	1	0	0
BBC_ARO	06/05/18	09/19/18	0.2	19	18	26.0	20.6	10	8	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_AR0	08/15/18	09/06/18	0.5	2	2	23.0	23.0	2	2	0	0
BBC_AR0	05/29/19	09/22/19	0.2	22	19	22.5	19.7	10	2	0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

MassDEP Nutrient Enrichment Indicator Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	Delta DO Max (mg/L)	Delta DO Avg (mg/L)	DO Sat Max (%)	pH Max (SU)	Count Algal Obsv.	Dense/V. Dense Film/Fila. Algae
W1380	2018	--	--	--	--	--	--	--	--	2	1
W2643	2016	--	--	--	--	--	--	--	--	3	0
W2840	2018	--	--	--	--	--	--	--	--	1	0

Buzzards Bay Coalition Freshwater Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	DO Sat Max (%)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count >16µg/L
BBC_AR0	2015	0.2	4	0.009	0.024	0.019	--	4	4.79	7.00	5.59	0
BBC_AR0	2016	0.2	4	0.013	0.015	0.014	--	4	2.32	13.90	7.59	0
BBC_AR0	2017	0.2	4	0.015	0.015	0.015	--	4	1.82	6.72	3.41	0
BBC_AR0	2018	0.2	4	0.015	0.015	0.015	--	4	1.26	2.99	2.20	0
BBC_AR0	2019	0.2	3	0.011	0.019	0.016	--	3	1.72	2.27	1.96	0

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_AR0	07/13/15	08/25/15	0.2	4	0.026	0.032	0.029
BBC_AR0	07/05/16	08/15/16	0.2	4	0.040	0.080	0.060
BBC_AR0	07/06/17	08/17/17	0.2	4	0.019	0.062	0.033
BBC_AR0	07/10/18	08/21/18	0.2	4	0.016	0.028	0.022
BBC_AR0	07/25/19	08/15/19	0.2	3	0.014	0.026	0.020

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Acushnet River AU (MA95-32); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff conducted surveys in this Acushnet River AU (MA95-32) at three sites during the summers of 2016 and 2018 from up to downstream as follows: approximately 120 feet downstream of Hamlin Street in Acushnet (W2643, n=3 in 2016), east of Mill Road, footbridge downstream of Saw Mill Pond outlet in Acushnet (W2840, n=2 in 2018), and farthest downstream just upstream at Tarkiln Hill Road/Main Street in New Bedford/Acushnet (W1380, n=2 in 2018). There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by MassDEP staff at any of the sites.</p> <p>The Aesthetics Use for this Acushnet River AU (MA95-32) will be assessed as Fully Supporting based on the general lack of objectionable conditions noted by MassDEP staff at the three sites sampled in the summers of 2016 or 2018. With one single exception there were no other observations of enriched conditions based on the field observations made by MassDEP staff during summer surveys in 2005, 2016, and 2018, so the "Nutrients" impairment is being removed (see justification in removal comments).</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1380	MassDEP	Water Quality	Acushnet River	[just upstream at Tarkiln Hill Road/Main Street, New Bedford/Acushnet]	41.681954	-70.918931
W2643	MassDEP	Water Quality	Acushnet River	[approximately 120 feet downstream of Hamlin Street, Acushnet]	41.695883	-70.914314
W2840	MassDEP	Water Quality	Acushnet River	[east of Mill Road, footbridge downstream of Saw Mill Pond outlet, Acushnet]	41.684081	-70.918984

Aesthetic Observations

Aesthetics Summary Statements for MassDEP Stations (2011-2018) (MassDEP Undated6)

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W1380	Acushnet River	2018	2	MassDEP aesthetics observations for station W1380 on Acushnet River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2018. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2).

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W2643	Acushnet River	2016	3	MassDEP aesthetics observations for station W2643 on Acushnet River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2016.
W2840	Acushnet River	2018	2	MassDEP aesthetics observations for station W2840 on Acushnet River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2018. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2).

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W1380	2018	2	2	1
W2643	2016	3	3	0
W2840	2018	2	1	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W1380	Acushnet River	2018	Color	None	2	2
W1380	Acushnet River	2018	Objectionable Deposits	NA	2	2
W1380	Acushnet River	2018	Odor	None	1	2
W1380	Acushnet River	2018	Odor	Other _____	1	2
W1380	Acushnet River	2018	Scum	NA	2	2
W1380	Acushnet River	2018	Turbidity	None	1	2
W1380	Acushnet River	2018	Turbidity	Slightly Turbid	1	2
W2643	Acushnet River	2016	Color	None	3	3
W2643	Acushnet River	2016	Objectionable Deposits	Not Applicable (N/A)	3	3
W2643	Acushnet River	2016	Odor	None	3	3
W2643	Acushnet River	2016	Scum	Not Applicable (N/A)	3	3
W2643	Acushnet River	2016	Turbidity	Slightly Turbid	3	3
W2840	Acushnet River	2018	Color	None	2	2
W2840	Acushnet River	2018	Objectionable Deposits	NA	2	2
W2840	Acushnet River	2018	Odor	Musty (Basement)	1	2
W2840	Acushnet River	2018	Odor	None	1	2
W2840	Acushnet River	2018	Scum	NA	2	2
W2840	Acushnet River	2018	Turbidity	Moderately Turbid	2	2

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO

2022 Use Attainment Summary

UMass Dartmouth volunteers collected *Enterococci* bacteria samples in this Acushnet River AU (MA95-32) at the Hamlin Street culvert in Acushnet (UMassD_4) between June and September 2019 (n=16). Further downstream MassDEP staff collected *E. coli* bacteria samples approximately 120 feet downstream of Hamlin Street in Acushnet (W2643) between July and September 2016 (n=3); east of Mill Road at the footbridge downstream of Saw Mill Pond outlet in Acushnet (W2840) in July 2018 (n=2), and farthest downstream just upstream of Tarkiln Hill Road/Main Street in New Bedford/Acushnet (W1380) in July 2018 (n=2). Data analysis indicated that 100% of the intervals at UMassD_4 site had GM's >35 cfu/100 ml and 62% of samples exceeded the 130 cfu/100ml STV. While none of the intervals at MassDEP sampling sites W2643 or W2840 had GM's >126 cfu/100 ml or samples exceeding the STV, 100% of the intervals at site W1380 had GM's >126 cfu/100 ml with 2 samples exceeding the 410 cfu/100 ml STV and a seasonal GM of 1540 cfu/100 ml.

The Primary Contact Recreational Use for this Acushnet River AU (MA95-32) will continue to be assessed as Not Supporting based on elevated *Enterococci* concentrations documented by UMass Dartmouth volunteers at Hamlin Street (UMassD_4) in 2019 (exceeded the use attainment impairment threshold for that single year high frequency dataset), the elevated *E. coli* concentrations documented by MassDEP staff at Tarkiln Hill Road (W1380) in 2018 (exceeded the use attainment impairment threshold for that single year low frequency dataset), and because of the presence of an active CSO outfall (this waterbody does not have a CSO variance in place). The impairments for *Enterococcus*, *E. coli* and Fecal coliform are all being carried forward. With one single exception there were no other observations of enriched conditions based on the field observations made by MassDEP staff during summer surveys in 2005, 2016, and 2018, so the "Nutrients" impairment is being removed (see justification in removal comments).

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1380	MassDEP	Water Quality	Acushnet River	[just upstream at Tarkiln Hill Road/Main Street, New Bedford/Acushnet]	41.681954	-70.918931
W2643	MassDEP	Water Quality	Acushnet River	[approximately 120 feet downstream of Hamlin Street, Acushnet]	41.695883	-70.914314
W2840	MassDEP	Water Quality	Acushnet River	[east of Mill Road, footbridge downstream of Saw Mill Pond outlet, Acushnet]	41.684081	-70.918984
UMassD_4	UMass Dartmouth	Water Quality	Acushnet River Downstream	Hamlin Street culvert, Acushnet, MA.	41.696021	-70.91424

Bacteria Data

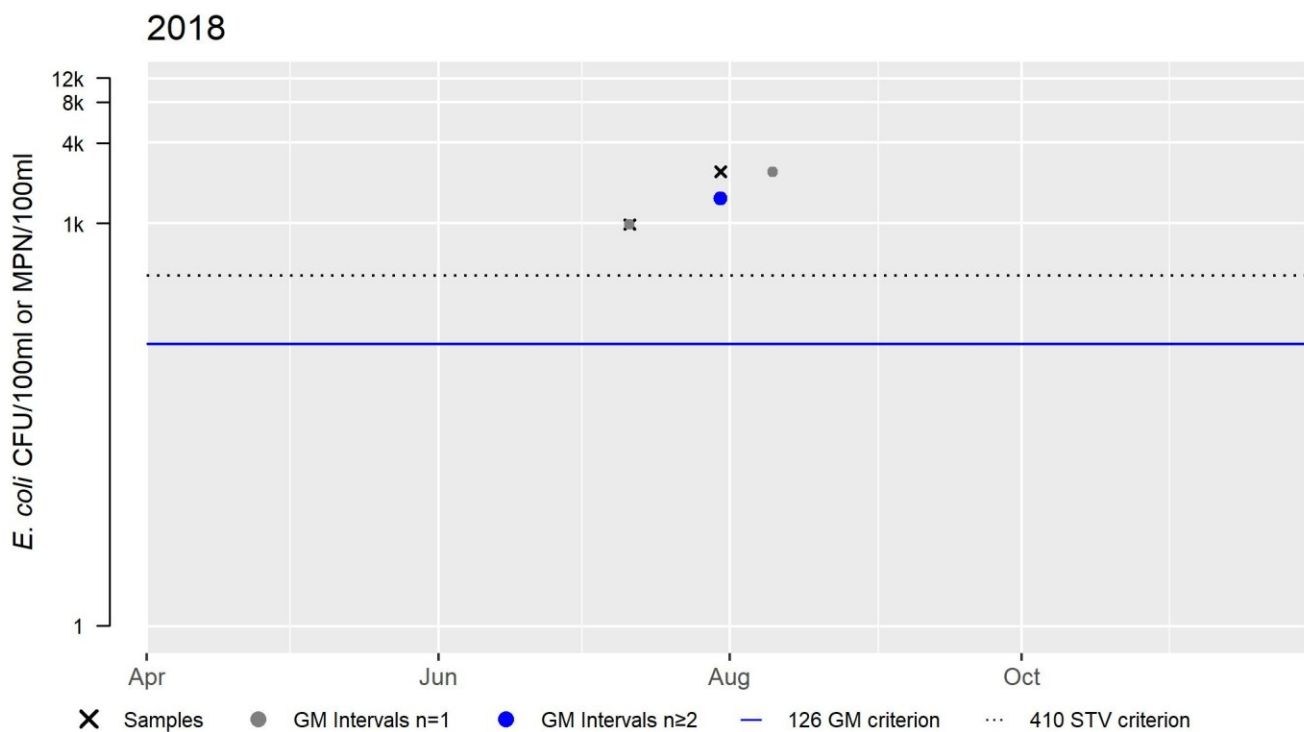
Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (30-day Interval Analysis) (MassDEP Undated11) (MassDEP Undated6) (UMass-Dartmouth 2019) (MassDEP Undated4)
 [Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
W1380	MassDEP	E. coli	07/11/18	07/30/18	2	980	2420	1540
W2643	MassDEP	E. coli	07/13/16	09/14/16	3	11	152	30
W2840	MassDEP	E. coli	07/11/18	07/30/18	2	5	52	16
UMassD_4	UMass Dartmouth	Enterococci	06/13/19	09/23/19	16	23	2035	164

W1380 *E. coli* (30-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	1540
#GMI	1
#GMI Ex	1
%GMI Ex	100
n>STV	2
%n>STV	100

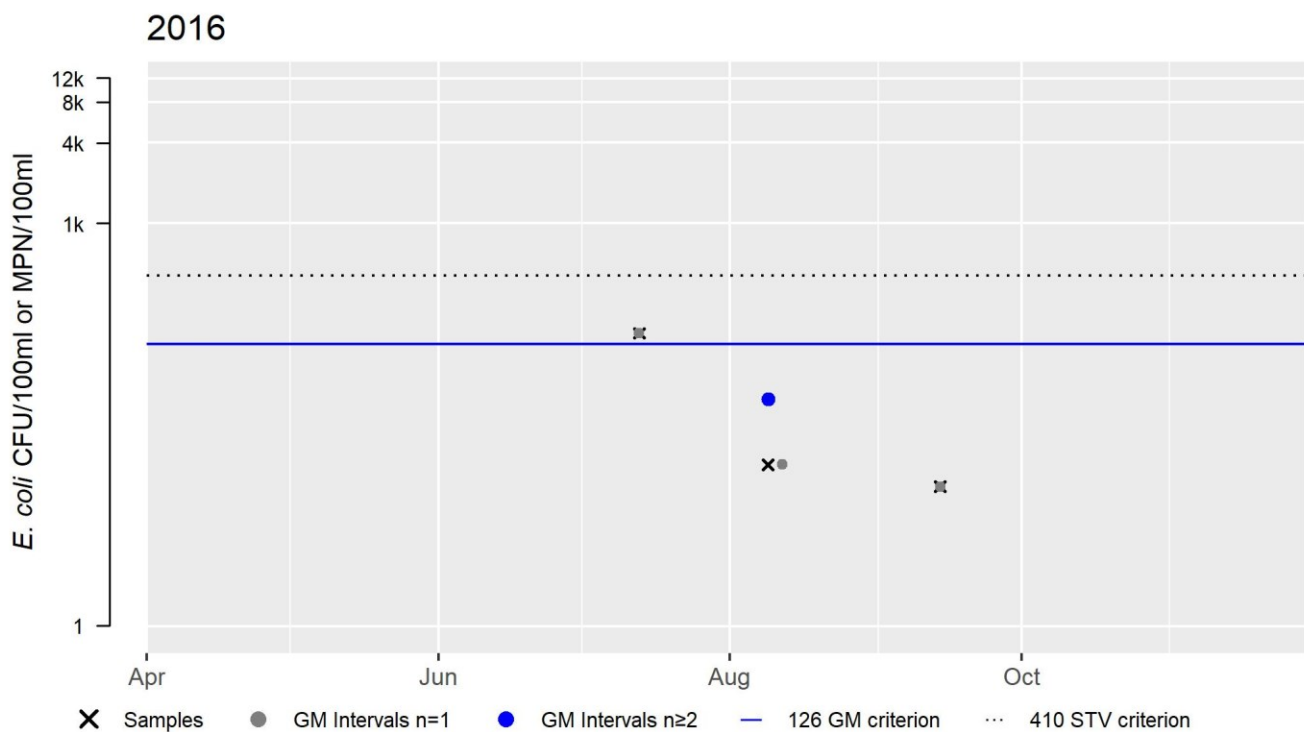
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2643 *E. coli* (30-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	30
#GMI	1
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

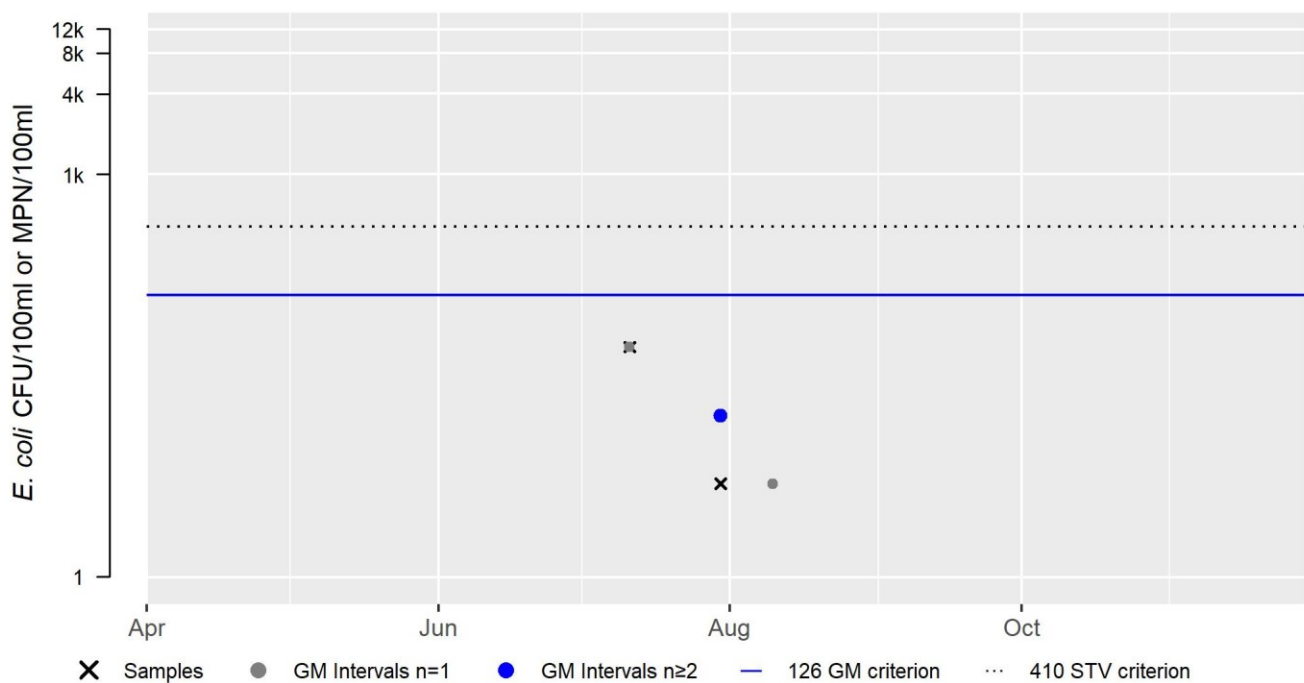


W2840 *E. coli* (30-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	16
#GMI	1
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

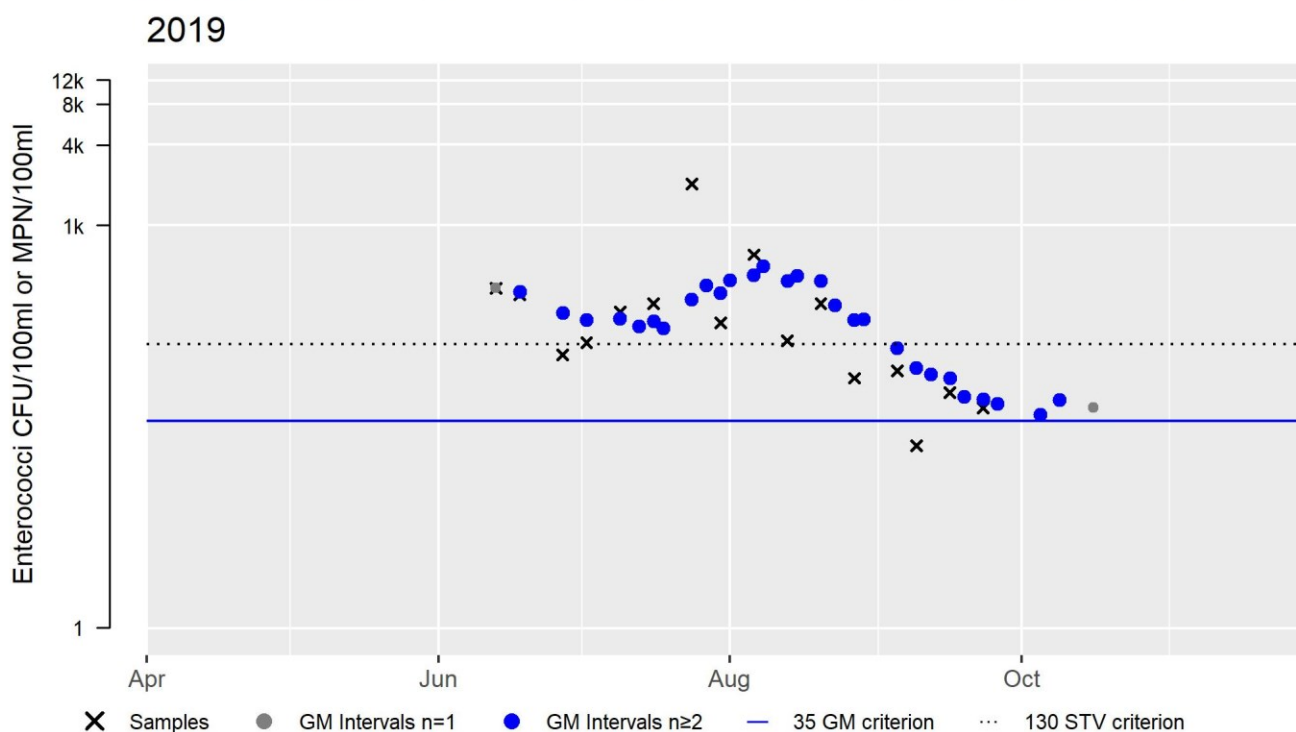
2018



UMassD_4 Enterococci (30-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	16
SeasGM	164
#GMI	28
#GMI Ex	28
%GMI Ex	100
n>STV	10
%n>STV	62

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019 (MassDEP Undated2)

Summary

BST work was conducted in 2018 at 2 sites on the Acushnet River AU (MA95-32). A hotspot area was noted downstream of Tarkiln Hill Rd with a max E.coli concentration of 2,419.6MPN and an odor of sewage was also sometimes detected on the wind at this site. It should be noted that there is a CSO pipe located under the Tarkiln Hill Rd bridge just upstream of the sample location. It is unclear at this time whether the CSO is the source of bacteria to the site downstream of Tarkiln Hill Rd.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

MassDEP staff collected *E. coli* bacteria samples in this Acushnet River AU (MA95-32) at three sampling locations from up to downstream as follows: 120 feet downstream of Hamlin Street in Acushnet (W2643) between July and September 2016 (n=3), east of Mill Road at the footbridge downstream of Saw Mill Pond outlet in Acushnet (W2840) in July 2018 (n=2), and farthest downstream just upstream of Tarkiln Hill Road/Main Street in New Bedford/Acushnet (W1380) in July 2018 (n=2). The available bacteria data at W2840 and W1380 are too limited to assess the Secondary Contact Recreational Use according to the CALM “Use Attainment Impairment Decision Schema”, though it should be noted that one sample at W1380 exceeded the 1260 cfu/100ml STV. Analysis of the single years’ worth of limited frequency data at Hamlin Street (W2643) indicated that none of the intervals had GM’s >630 cfu /100 ml and none of the samples exceeded the 1260 cfu/100 ml STV, with a seasonal GM of 30 cfu/100 ml.

The Secondary Contact Recreational Use for this Acushnet River AU (MA95-32) will continue to be assessed as Not Supporting based on the elevated *E. coli* concentrations documented by MassDEP staff at Tarkiln Hill Road/Main Street in New Bedford/Acushnet in 2018 and because of the presence of an active CSO outfall (this waterbody does not have a CSO variance in place). The *E. coli* and Fecal Coliform impairments are being carried forward . With one single exception there were no other observations of enriched conditions based on the field observations made by MassDEP staff during summer surveys in 2005, 2016, and 2018, so the “Nutrients” impairment is being removed (see justification in removal comments).

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1380	MassDEP	Water Quality	Acushnet River	[just upstream at Tarkiln Hill Road/Main Street, New Bedford/Acushnet]	41.681954	-70.918931
W2643	MassDEP	Water Quality	Acushnet River	[approximately 120 feet downstream of Hamlin Street, Acushnet]	41.695883	-70.914314
W2840	MassDEP	Water Quality	Acushnet River	[east of Mill Road, footbridge downstream of Saw Mill Pond outlet, Acushnet]	41.684081	-70.918984

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP

Undated11) (MassDEP Undated6)

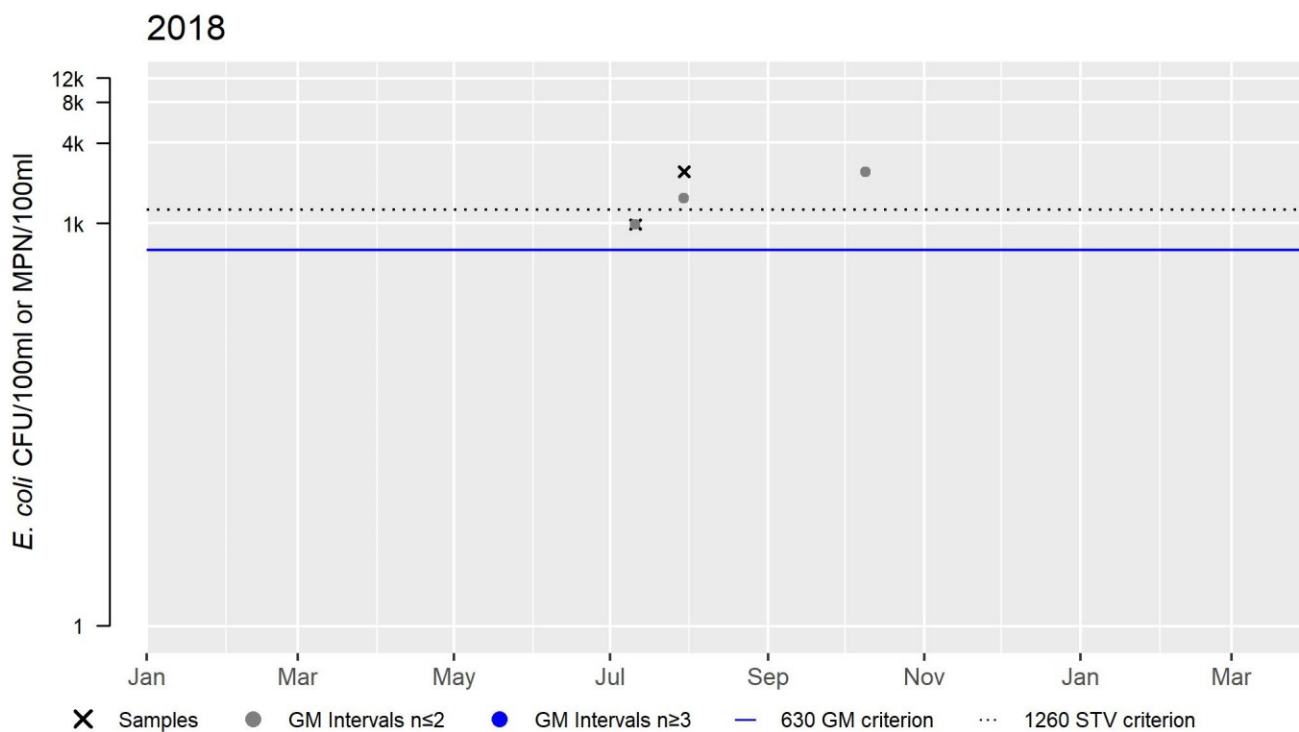
[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
W1380	MassDEP	E. coli	07/11/18	07/30/18	2	980	2420	1540
W2643	MassDEP	E. coli	07/13/16	09/14/16	3	11	152	30
W2840	MassDEP	E. coli	07/11/18	07/30/18	2	5	52	16

W1380 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	1540
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	50

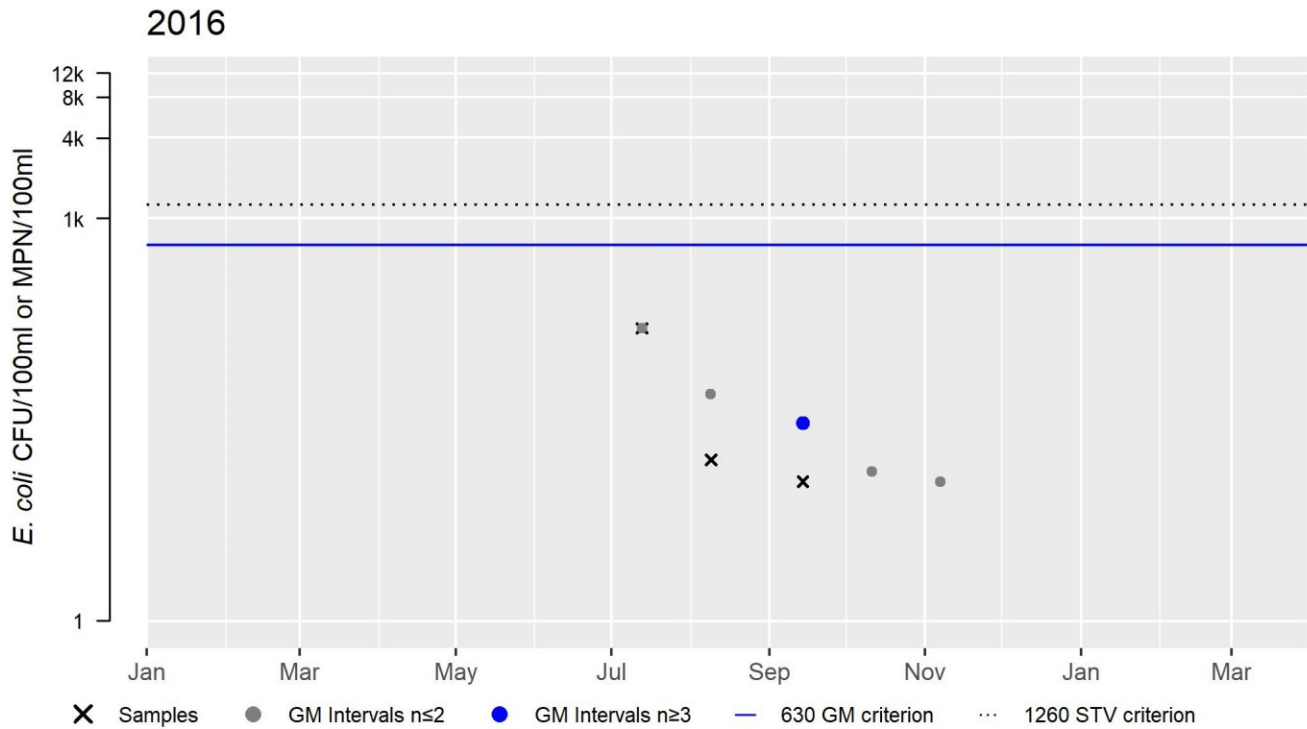
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2643 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	30
#GMI	1
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

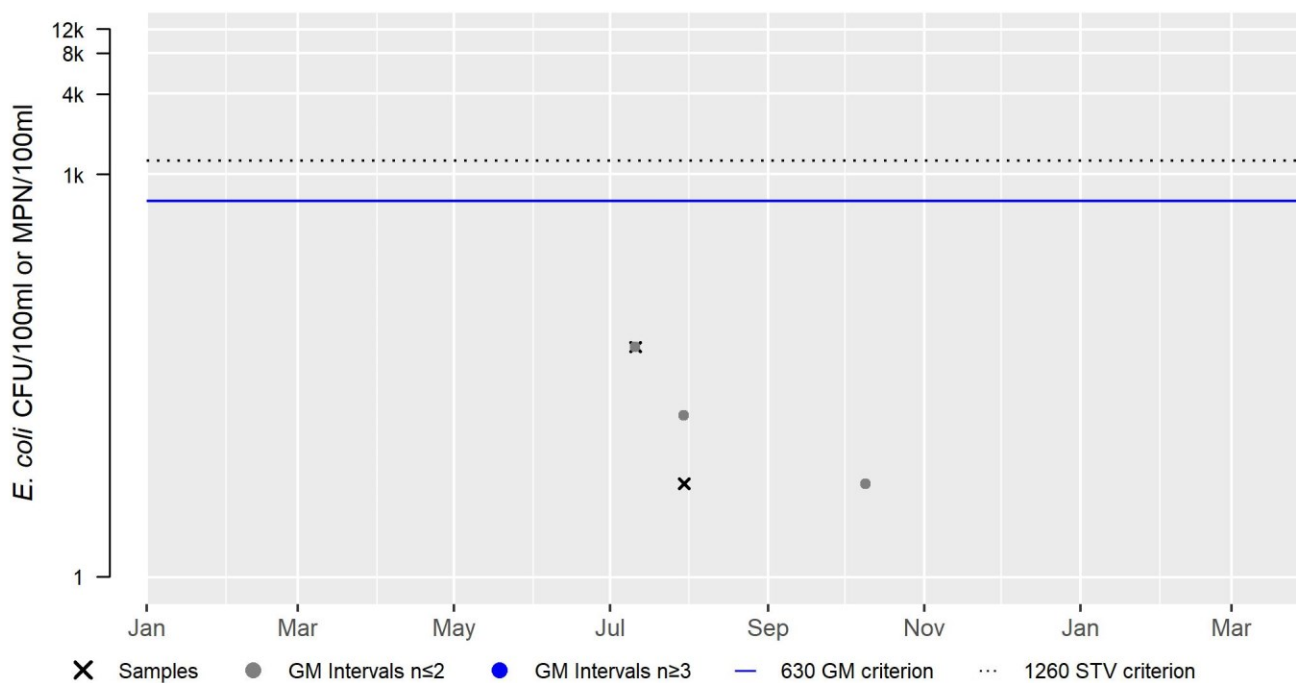


W2840 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	16
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2018



Acushnet River (MA95-33)

Location:	Outlet Main Street culvert, Acushnet to Coggeshall Street/Howland Road bridge, New Bedford/Fairhaven.
AU Type:	ESTUARY
AU Size:	0.31 SQUARE MILES
Classification/Qualifier:	SB: SFR, CSO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Debris*)		Unchanged
5	5	Color		Unchanged
5	5	Dissolved Oxygen		Unchanged
5	5	Enterococcus	36171	Unchanged
5	5	Fecal Coliform	36171	Unchanged
5	5	Metals		Unchanged
5	5	Nitrogen, Total		Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
5	5	Odor		Unchanged
5	5	Oil and Grease		Unchanged
5	5	PCBs in Fish Tissue		Added
5	5	Polychlorinated Biphenyls (PCBs)		Unchanged
5	5	Trash		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Debris*)	Combined Sewer Overflows (N)				X	X	X
(Debris*)	Municipal (Urbanized High Density Area) (N)				X	X	X
Color	Combined Sewer Overflows (N)				X	X	X
Color	Municipal (Urbanized High Density Area) (N)				X	X	X
Dissolved Oxygen	Agriculture (Y)	X					
Dissolved Oxygen	Combined Sewer Overflows (N)	X					
Dissolved Oxygen	Municipal Point Source Discharges (Y)	X					
Dissolved Oxygen	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Dissolved Oxygen	Residential Districts (Y)	X					
Enterococcus	Combined Sewer Overflows (N)					X	X
Enterococcus	Municipal (Urbanized High Density Area) (N)					X	X
Fecal Coliform	Combined Sewer Overflows (N)			X			
Fecal Coliform	Municipal (Urbanized High Density Area) (N)			X			

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Metals	CERCLA NPL (Superfund) Sites (N)	X					
Metals	Contaminated Sediments (N)	X					
Nitrogen, Total	Agriculture (Y)	X					
Nitrogen, Total	Combined Sewer Overflows (N)	X					
Nitrogen, Total	Municipal Point Source Discharges (Y)	X					
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nitrogen, Total	Residential Districts (Y)	X					
Nutrient/Eutrophication Biological Indicators	Agriculture (Y)	X					
Nutrient/Eutrophication Biological Indicators	Combined Sewer Overflows (N)	X					
Nutrient/Eutrophication Biological Indicators	Impervious Surface/Parking Lot Runoff (Y)	X					
Nutrient/Eutrophication Biological Indicators	Municipal Point Source Discharges (Y)	X					
Nutrient/Eutrophication Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nutrient/Eutrophication Biological Indicators	Residential Districts (Y)	X					
Odor	Combined Sewer Overflows (N)				X	X	X
Odor	Municipal (Urbanized High Density Area) (N)				X	X	X
Oil and Grease	Combined Sewer Overflows (N)				X	X	X
Oil and Grease	Municipal (Urbanized High Density Area) (N)				X	X	X
PCBs in Fish Tissue	CERCLA NPL (Superfund) Sites (N)		X				
PCBs in Fish Tissue	Contaminated Sediments (N)		X				
Polychlorinated Biphenyls (PCBs)	CERCLA NPL (Superfund) Sites (N)	X		X			
Polychlorinated Biphenyls (PCBs)	Contaminated Sediments (N)	X		X			
Trash	Combined Sewer Overflows (N)				X	X	X
Trash	Municipal (Urbanized High Density Area) (N)				X	X	X

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at two locations in Acushnet at the upstream end of this Acushnet River AU (MA95-33) in the summers of 2015-2019, as follows: BBC_AR1A and AR1. Monitoring was conducted in the surface waters at both locations, as well as deeper in the water column (at depths ranging 0.5-1.2m) and was usually conducted weekly (between the hours of 6 and 9am): The maximum temperature was 30°C at BBC_AR1 in 2016, though was never higher than 29.4°C the rest of the time (n=102), the minimum dissolved oxygen (DO) was 0.0mg/L (n=94) and there were frequent and severe excursions from the DO criterion at a range of depths including surface waters; with 70 measurements <5.0mg/L (74% of the measurements overall) and 57 measurements <4.0mg/L (61% of the measurements overall). Nutrient sampling efforts (ebb tides in July and August at BBC_AR1 n=18, maximum 1.70mg/L) documented seasonal average total nitrogen concentrations between 0.84-1.29mg/L. Chlorophyll *a* concentrations were >10µg/L the majority of the time (74% overall) (n=19), with a maximum of 57.5µg/L in 2016. Secchi disk depths at BBC_AR1 ranged from 0.5 to 1.5m (n=18). Ammonia-nitrogen concentrations were elevated at times, (range 0.008 to 0.26mg/L (n=19)), however TUs for ammonia-nitrogen could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for this Acushnet River AU (MA95-33) will continue to be assessed as Not Supporting based on the water quality data collected by the BBC staff/volunteers in 2015-2019 which are indicative of poor conditions. The Dissolved Oxygen, Metals, Total Nitrogen, Nutrient/Eutrophication Biological Indicators and PCB's impairments are all being carried forward.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_AR1	Buzzards Bay Coalition	Water Quality	Acushnet River	Acushnet River Estuary, Acushnet	41.678494	-70.91673
BBC_AR1A	Buzzards Bay Coalition	Water Quality	Acushnet River	Acushnet River Estuary, Acushnet	41.681882	-70.919008

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_AR1	06/03/15	09/14/15	0.2	14	1.2	4.4	71	64	43
BBC_AR1	06/03/15	09/02/15	0.5	8	1.1	4.0	63	63	63
BBC_AR1	06/06/16	09/16/16	0.2	12	1.0	3.2	83	83	75
BBC_AR1	07/12/16	09/16/16	0.5	9	0.5	2.3	100	100	100
BBC_AR1	06/29/17	09/21/17	0.2	6	1.5	3.4	83	83	67
BBC_AR1	08/02/17	09/21/17	1.2	4	1.3	3.0	100	100	75
BBC_AR1	05/30/18	07/27/18	0.2	7	1.7	5.7	43	29	29
BBC_AR1	05/30/18	09/18/18	0.7	12	0.3	3.3	100	83	50
BBC_AR1	07/02/19	09/17/19	0.2	6	2.0	5.2	50	50	33
BBC_AR1	06/05/19	09/17/19	0.8	14	1.1	3.9	86	71	57
BBC_AR1A	07/31/15	07/31/15	0.2	1	2.1	2.1	100	100	100
BBC_AR1A	07/31/15	07/31/15	0.5	1	0.0	0.0	100	100	100

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_AR1	06/03/15	09/14/15	0.2	19	19	28.4	23.8	0
BBC_AR1	06/03/15	09/02/15	0.6	8	8	27.6	24.0	0
BBC_AR1	06/06/16	09/16/16	0.2	16	15	30.0	25.0	1
BBC_AR1	07/12/16	09/16/16	0.6	9	8	28.8	26.2	0
BBC_AR1	06/29/17	09/21/17	0.2	10	9	28.2	24.0	0
BBC_AR1	08/02/17	09/21/17	1.1	4	3	25.9	23.5	0
BBC_AR1	05/30/18	07/27/18	0.2	8	7	26.3	22.6	0
BBC_AR1	05/30/18	09/18/18	0.7	12	10	26.9	24.4	0
BBC_AR1	07/02/19	09/17/19	0.2	9	8	26.0	23.4	0
BBC_AR1	06/05/19	09/17/19	0.8	14	13	27.6	23.3	0
BBC_AR1A	07/31/15	07/31/15	0.2	1	1	27.1	27.1	0
BBC_AR1A	07/31/15	07/31/15	0.5	1	1	27.4	27.4	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_AR1	2015	0.2	4	0.69	0.99	0.84	4	7.31	22.07	14.06	0	3
BBC_AR1	2016	0.2	3	0.96	1.11	1.05	4	23.80	57.49	35.11	0	4
BBC_AR1	2017	0.2	4	0.83	1.70	1.29	4	5.28	31.32	17.40	0	3
BBC_AR1	2018	0.2	4	0.82	1.16	0.96	4	3.27	13.44	8.58	1	2
BBC_AR1	2019	0.2	3	0.64	1.37	1.00	3	1.33	21.65	11.59	1	2

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_AR1	07/31/15	07/31/15	1	1.2	1.2	1.2
BBC_AR1	07/29/16	08/31/16	2	0.5	0.6	0.6
BBC_AR1	09/07/17	09/21/17	2	0.9	0.9	0.9
BBC_AR1	06/12/18	09/18/18	5	0.8	1.5	1.0
BBC_AR1	06/20/19	09/17/19	8	0.6	1.4	1.0

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

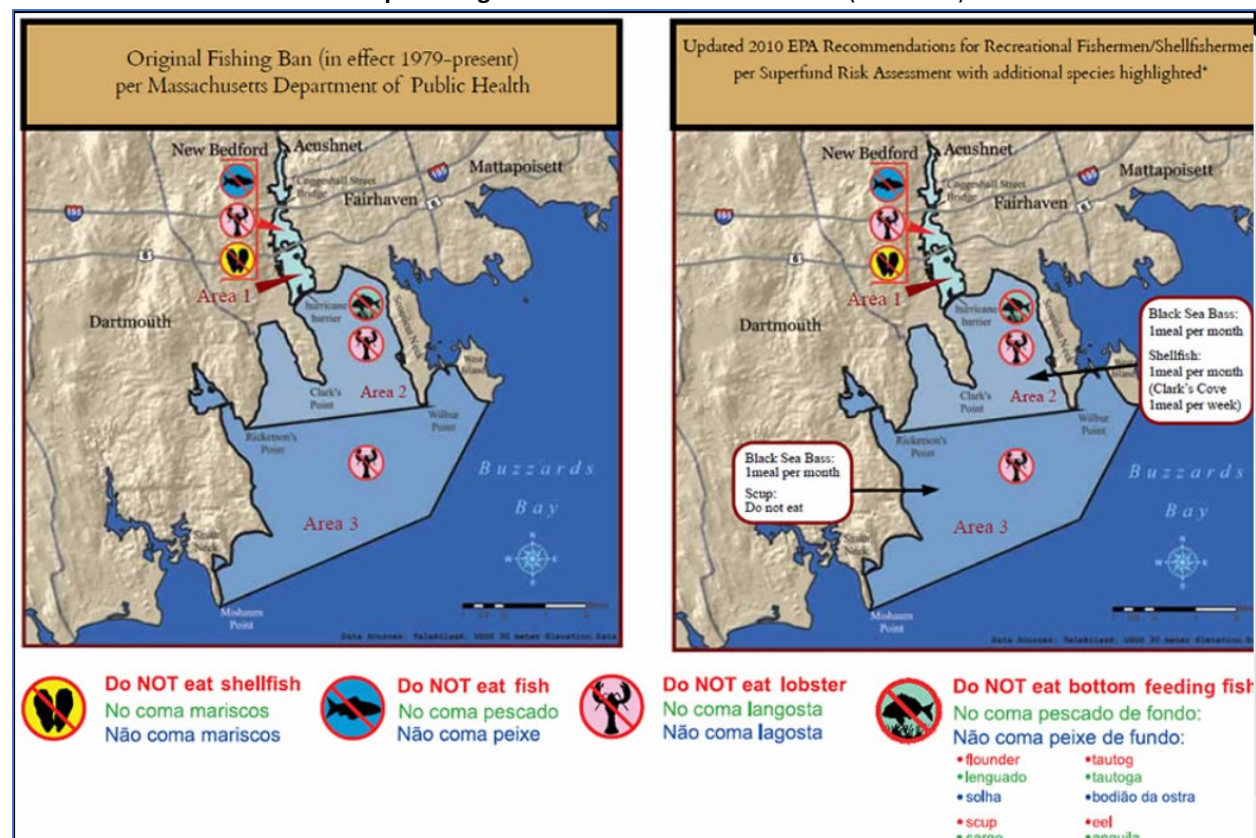
[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_AR1	07/13/15	08/25/15	0.2	4	0.016	0.099	0.042
BBC_AR1	07/05/16	08/15/16	0.2	4	0.008	0.030	0.020
BBC_AR1	07/06/17	08/17/17	0.2	4	0.017	0.158	0.073
BBC_AR1	07/10/18	08/21/18	0.2	4	0.017	0.260	0.097
BBC_AR1	07/25/19	08/15/19	0.2	3	0.023	0.228	0.099


Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
The Fish Consumption Use for the Acushnet River estuary (MA95-33) is assessed as Not Supporting. EPA and MA DPH recommend the public not eat any shellfish, fish, or lobster from area 1 of New Bedford Harbor (includes the Acushnet River estuary) because of PCB contamination (EPA 2022). A PCBs in Fish Tissue impairment is being added.	

New Bedford Harbor Fish Consumption Regulations and Recommendations (EPA 2022)



Reminders from State Officials (MassDPH 2017)



Q: Why are health officials reminding the public to avoid eating fish and other seafood from Area 1 of New Bedford Harbor?
A: In 1979 the Massachusetts Department of Public Health (MDPH) promulgated regulations to close Area 1 to all fishing activities due to significant polychlorinated biphenyl (PCB) contamination. Recent reports of individuals fishing in that area are prompting health and environmental officials to raise public awareness regarding the health risks associated with consumption of fish, lobster, and shellfish taken from Area 1 and regulatory bans.

Q: Where is Area 1 located and what are the boundaries?
A: Area 1 is bounded by the communities of New Bedford and Fairhaven and includes all areas of the Acushnet River and New Bedford Harbor north of the Hurricane Barrier as shown on the map. The Hurricane Barrier is located near Gifford Street in New Bedford and Fort Phoenix Beach State Reservation in Fairhaven.

Q: What is the concern about Area 1?
A: The Acushnet River estuary, New Bedford Harbor, and parts of Buzzards Bay sediments are contaminated with PCBs. The highest levels of PCBs in seafood are found in fish, lobster, and shellfish in Area 1. **Fish, lobster or shellfish caught from Area 1 should not be consumed.**

Q: What are PCBs and where do they come from?
A: PCBs are a group of manmade chemicals that are highly stable, heat resistant, and non-flammable and they do not evaporate or dissolve easily in water. Historically, PCBs have been used as industrial chemicals and insulating material in electrical.

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Acushnet River (MA95-33): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2907 sq mi (93%). The sum of the approved, conditionally approved, and restricted shellfish growing areas represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.2907 sq mi (93%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of prohibited and approved, conditionally approved, and/or restricted. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB15.11	New Bedford/Fairhaven Inner Harbor	Prohibited	0.29068	93.2%

Aesthetic

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

No recent data are available to assess the status of the Aesthetic Use for this Acushnet River AU (MA95-33), so it will continue to be assessed as Not Supporting, with the Color, Debris, Odor, Oil and Grease, and Trash impairments being carried forward.

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p><i>Enterococcus</i> bacteria samples were collected at one station along this Acushnet River AU (MA95-33) by UMass Dartmouth volunteers during the summer of 2019. Samples were collected on the west bank towards the downstream end of the AU, at 94-1 Sawyer Street. Data analysis of this single-year, moderate frequency <i>Enterococcus</i> dataset indicated poor conditions (elevated bacteria) as 58% of intervals had GMs >35 cfu/100ml and 3 samples exceeded the 130 cfu/100ml STV.</p> <p>The Primary Contact Recreational Use for this Acushnet River AU (MA95-33) will continue to be assessed as Not Supporting since the <i>Enterococcus</i> concentrations exceeded the use attainment impairment thresholds at the one site sampled in 2019 and because of the presence of active CSO outfalls (this waterbody does not have a CSO variance in place). The impairments for Enterococcus, Color, Debris, Odor, Oil and Grease and Trash are all being carried forward.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
UMassD_11	UMass Dartmouth	Water Quality	New Bedford Inner Harbor	94-1 Sawyer Street, New Bedford	41.658423	-70.919084

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (30-day Interval Analysis) (UMass-Dartmouth 2019) (MassDEP Undated4)

[Result units are CFU/100ml or MPN/100ml]

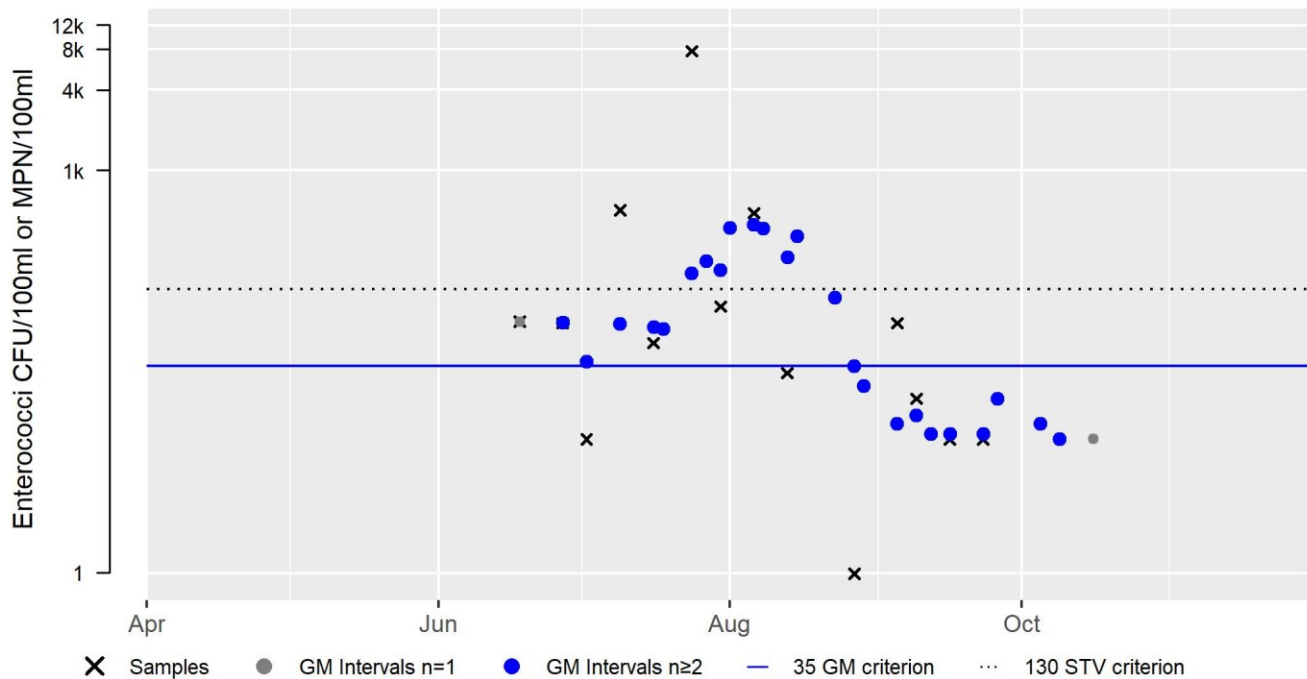
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
UMassD_11	UMass Dartmouth	Enterococci	06/18/19	09/23/19	14	1	7701	55

UMassD_11 Enterococci (30-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	14
SeasGM	55
#GMI	24
#GMI Ex	14
%GMI Ex	58
n>STV	3
%n>STV	21

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2019



Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary

Acushnet River (MA95-33): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2907 sq mi (93%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO

2022 Use Attainment Summary

Enterococcus bacteria samples were collected at one station along this Acushnet River AU (MA95-33) by UMass Dartmouth volunteers during the summer of 2019. Samples were collected on the west bank towards the downstream end of the AU, at 94-1 Sawyer Street. Data analysis of this single-year, moderate frequency *Enterococcus* dataset indicated generally good conditions (low bacteria concentrations) as no intervals had GMs >175 cfu/100ml, however 3 samples did greatly exceeded the 350cfu/100ml STV.

The Secondary Contact Recreational Use for this Acushnet River AU (MA95-33) will continue to be assessed as Not Supporting since a number of the *Enterococcus* samples collected during the summer of 2019 greatly exceeded the STV (Statistical Threshold Value) threshold and because of the presence of active CSO outfalls (this waterbody does not have a CSO variance in place). The impairments for Enterococcus, Color, Debris, Odor, Oil and Grease, and Trash are all being carried forward.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
UMassD_11	UMass Dartmouth	Water Quality	New Bedford Inner Harbor	94-1 Sawyer Street, New Bedford	41.658423	-70.919084

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (UMass-Dartmouth 2019) (MassDEP Undated4)

[Result units are CFU/100ml or MPN/100ml]

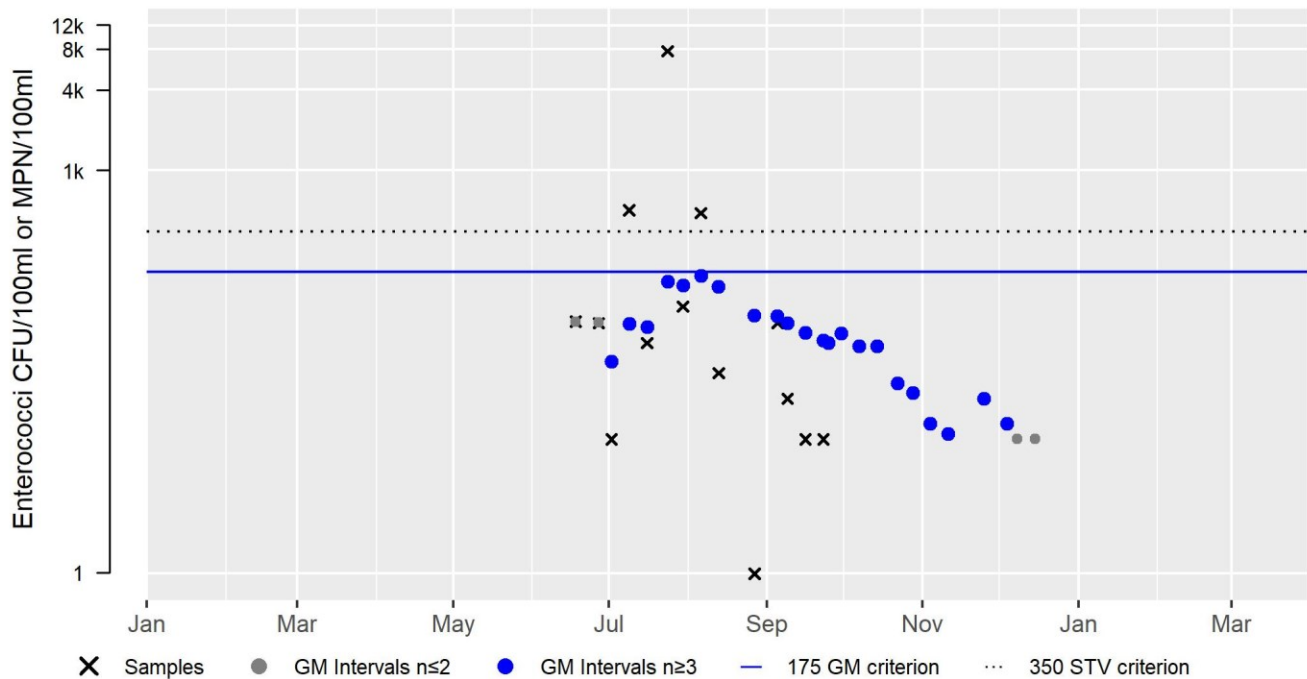
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
UMassD_11	UMass Dartmouth	Enterococci	06/18/19	09/23/19	14	1	7701	55

UMassD_11 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	14
SeasGM	55
#GMI	22
#GMI Ex	0
%GMI Ex	0
n>STV	3
%n>STV	21

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2019



Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary

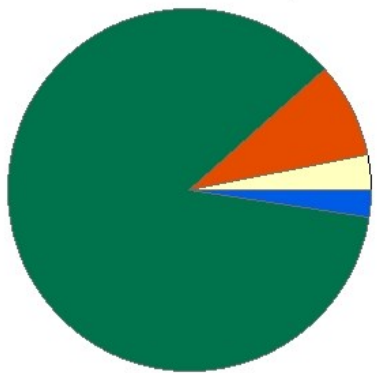
Acushnet River (MA95-33): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2907 sq mi (93%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than "approved", the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Agawam River (MA95-28)

Location:	Outlet Mill Pond, Wareham to Wareham WWTP outfall, Wareham.
AU Type:	RIVER
AU Size:	0.6 MILES
Classification/Qualifier:	B: WWF, HQW

Agawam River - MA95-28

Watershed Area: 17.23 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	17.23	3.61	4.78	2.2
Agriculture	3.1%	9.4%	10.7%	15.2%
Developed	8.5%	14.7%	11.1%	14.6%
Natural	86%	69.3%	70.6%	60.9%
Wetland	2.4%	6.6%	7.6%	9.3%
Impervious Cover	3.8%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	4c	(Fish Passage Barrier*)		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Hydrostructure Impacts on Fish Passage (Y)	X				

Recommendations

2022 Recommendations
ALU: Monitor water quality in the Agawam River (MA95-28) in a couple of representative locations, being sure to include nutrient enrichment indicators.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
<p>DMF biologists note one structure at the upstream end of this Agawam River AU (MA95-28), affecting the passage of diadromous fish between the river and Mill Pond upstream (MA95105). The Mill Pond Dam (NATID# MA00027) (with existing Steeppass fishway), was given a passage score of "4", on a 0-10 scale, indicating that the dam restricts the passage of the targeted species, river herring and American eel. The population score was 6. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at one location in the summers of 2015-2019, at the upstream end of the AU at the Mill Pond outlet, Rt.6 in Wareham (BBC_AG3). Monitoring was conducted in the surface waters, as well as deeper in the water column (average depth sampling ranged from 0.3 to 0.8m) and was usually conducted weekly in the summer months (between 6 & 9am). The maximum temperature was 27.3°C (n=87) and the minimum dissolved oxygen was 6.0mg/L (n=88). Total phosphorus sampling (n=20, maximum 0.02mg/L) in July and August documented seasonal average total phosphorus concentrations between 0.015-0.016mg/L. The maximum chlorophyll <i>a</i> was 36.5µg/L (n=20); >16µg/L four times (twice in 2017 and once in 2018 and in 2019). Secchi disk depths were 0.5 and 1.2m in 2015 and 2019, respectively. Ammonia-nitrogen concentrations were generally low (range 0.014 to 0.08mg/L, n=19), though TUs could not be calculated (lack of quality assured pH and salinity data).</p> <p>The Aquatic Life Use for this Agawam River AU (MA95-28) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Mill Pond Dam. The water quality data collected by BBC staff/volunteers at the Mill Pond outlet in Wareham in summers 2015-2019 is indicative of generally good conditions, but an Alert is being identified for elevated chlorophyll <i>a</i>. The prior alert for low flow concerns is also being carried forward.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_AG3	Buzzards Bay Coalition	Water Quality	Agawam River	Agawam River Fresh, Wareham	41.76261	-70.67575

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
<p>DMF biologists note one structure at the upstream end of the Agawam River AU, assisting the passage of diadromous fish between the Agawam River and the pond AU upstream (Mill Pond MA95105). The Mill Pond Dam (NATID# MA00027) (with existing Steeppass fishway), was given a passage score of "4", on a 0-10 scale, indicating that the dam restricts the passage of the targeted species, river herring and American eel. The population score was noted to be "6" in this area. The Aquatic Life Use for Agawam River (Assessment Unit MA95-28) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Mill Pond Dam.</p>

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Freshwater Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Average Sample depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
BBC_AG3	06/09/15	09/14/15	0.2	18	7.3	8.1	0	0	0
BBC_AG3	06/09/15	09/14/15	0.7	13	6.8	8.2	0	0	0
BBC_AG3	06/07/16	09/21/16	0.1	7	7.5	7.7	0	0	0
BBC_AG3	06/07/16	09/16/16	0.6	3	7.2	7.6	0	0	0
BBC_AG3	07/06/17	08/17/17	0.2	5	7.5	7.7	0	0	0
BBC_AG3	09/05/17	09/05/17	0.3	1	8.3	8.3	0	0	0
BBC_AG3	06/21/18	08/21/18	0.2	10	7.0	7.5	0	0	0
BBC_AG3	06/06/18	08/04/18	0.8	9	6.5	8.4	0	0	0
BBC_AG3	06/01/19	08/15/19	0.2	9	6.5	7.7	0	0	0
BBC_AG3	06/25/19	09/09/19	0.8	13	6.0	6.5	0	0	0

Buzzards Bay Coalition Discrete Freshwater Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_AG3	05/28/15	09/14/15	0.2	20	19	26.2	23.3	17	14	0	0
BBC_AG3	05/28/15	09/14/15	0.8	15	14	26.2	23.1	11	9	0	0
BBC_AG3	06/07/16	09/21/16	0.2	7	5	27.3	24.8	5	4	0	0
BBC_AG3	06/07/16	09/16/16	0.6	3	2	23.7	22.7	2	1	0	0
BBC_AG3	07/06/17	08/17/17	0.2	5	5	25.5	23.7	5	5	0	0
BBC_AG3	09/05/17	09/05/17	0.3	1	1	19.0	19.0	0	0	0	0
BBC_AG3	06/21/18	08/21/18	0.1	10	10	26.4	23.8	9	9	0	0
BBC_AG3	06/06/18	08/04/18	0.8	9	9	25.0	22.0	5	4	0	0
BBC_AG3	06/01/19	08/15/19	0.2	9	9	24.7	21.5	6	5	0	0
BBC_AG3	06/25/19	09/09/19	0.8	13	13	25.4	23.2	12	10	0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Freshwater Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	DO Sat Max (%)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count >16µg/L
BBC_AG3	2015	0.2	4	0.009	0.019	0.015	-	4	3.49	10.96	6.54	0
BBC_AG3	2016	0.2	4	0.015	0.020	0.016	-	4	1.68	5.83	4.07	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	DO Sat Max (%)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count >16µg/L
BBC_AG3	2017	0.2	4	0.015	0.015	0.015	--	4	8.18	19.62	14.42	2
BBC_AG3	2018	0.2	4	0.015	0.015	0.015	--	4	7.10	36.50	15.17	1
BBC_AG3	2019	0.2	4	0.011	0.017	0.015	--	4	3.77	32.56	12.50	1

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_AG3	07/30/15	07/30/15	1	0.5	0.5	0.5
BBC_AG3	07/02/19	07/02/19	1	1.2	1.2	1.2

Toxics and other pollutants (metals, ammonia, chloride, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_AG3	07/13/15	08/25/15	0.2	4	0.016	0.024	0.021
BBC_AG3	07/05/16	08/15/16	0.2	4	0.017	0.032	0.022
BBC_AG3	07/06/17	08/17/17	0.2	4	0.007	0.018	0.013
BBC_AG3	07/10/18	08/21/18	0.2	4	0.012	0.137	0.060
BBC_AG3	07/11/19	08/15/19	0.2	4	0.009	0.018	0.012

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Agawam River AU (MA95-28); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Agawam River AU (MA95-28) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	

No *Enterococci* or *E. coli* bacteria data are available to assess the Primary Contact Recreational Use for this Agawam River AU (MA95-28) so it is Not Assessed.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E. coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for this Agawam River AU (MA95-28) so it is Not Assessed.	

Agawam River (MA95-29)

Location:	Wareham WWTP outfall, Wareham to confluence with Wankinco River (forming headwaters of the Wareham River) just north of the Route 6 bridge, Wareham.
AU Type:	ESTUARY
AU Size:	0.16 SQUARE MILES
Classification/Qualifier:	SB: SFR

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Algae		Unchanged
5	5	Fecal Coliform	36171	Unchanged
5	5	Nitrogen, Total		Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Algae	Agriculture (Y)	X			X	X	X
Algae	Municipal Point Source Discharges (Y)	X			X	X	X
Algae	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X			X	X	X
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Agriculture (Y)	X					
Nitrogen, Total	Municipal Point Source Discharges (Y)	X					
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nutrient/Eutrophication Biological Indicators	Agriculture (Y)	X					
Nutrient/Eutrophication Biological Indicators	Municipal Point Source Discharges (Y)	X					
Nutrient/Eutrophication Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented a small area (~0.01mi²) of eelgrass bed habitat in 2001 in this Agawam River AU but none was mapped in any other year. The river also receives the treated wastewater discharge from the Wareham WWTP (MA0101893). It is noted here that a major upgrade to the Wareham WWTP was undertaken and online between September/October 2005. Water was collected from the river at the south side of Sandwich Rd (Rt. 6) in Wareham, to be used as a site control in the facility's whole effluent toxicity (WET) tests. Survival of *M. beryllina* exposed (~7-days) to river water was good (≥85%) (n=17 tests between September 2015 and 2019). A total of 17 modified acute and chronic WET tests were conducted on the WWTP treated effluent (outfall #001) using *M. beryllina* as the test organisms. There was no evidence of acute toxicity, with all LC50s >100% effluent (n=16 valid tests). The CNOEC results ranged from 50 to 100% effluent and all chronic tests met the CNOEC limit of ≥18.2% effluent (n=16 valid tests). Results of the chronic *Arbacia punctulata* fertilization tests also met the permit limit (CNOEC results ranged from 50 to 100% effluent). The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at two locations in this Agawam River, Wareham AU (MA95-29) in the summers of 2015-2019, from upstream to downstream as follows: close to the upstream end of the AU at the Rt.6 bridge (BBC_AG1) (same location as the WET river sampling site) and roughly two-thirds of the way down (on the north bank) at a dock off Sandpiper Terrace (BBC_AG2). Monitoring was conducted in the surface waters at both locations, as well as at depths ranging 2.2 to 3.0m at BBC_AG1 and 0.6 to 1.2m at BBC_AG2 and was usually conducted weekly (6-9am). The maximum temperature was 28.9°C (n=217). The minimum DO was 2.7mg/L (n=242); <5.0mg/L 79 times (~33% of the measurements overall) and <4.0mg/L 14 times (~6% overall). Excursions from the 5.0mg/L criterion occurred at both stations and at all depths but were more frequent at the upstream site BBC_AG1. Total nitrogen sampling (n=40, maximum 1.66mg/L) during ebb tides in June through September (and only in July and August in 2018 and 2019) documented seasonal average total nitrogen concentrations between 0.4 and 0.8mg/L and were above 0.5mg/L at BBC_AG1 in 2016, 2017, and 2018 and at BBC_AG2 in 2016, 2017, 2018, and 2019. Chlorophyll *a* was often elevated at both stations (n=55), with concentrations >10µg/L documented between one and five times a year except at BBC_AG2 in 2019 when the max was 8.8µg/L. The overall max was 133µg/L, though this was flagged as unusual (but still valid) with a note "high particulate/phytoplankton load". Secchi disk depths at BBC_AG1 ranged from 0.4 to 2.7m (n=90). Ammonia-nitrogen ranged from 0.004 to 0.11mg/L (n=55), though TUs could not be calculated due to a lack of quality assured pH and salinity data.

The Aquatic Life Use for this Agawam River AU (MA95-29) will continue to be assessed as Not Supporting based on the water quality data collected by the BBC staff/volunteers between 2015 and 2019. The Algae and Total Nitrogen impairments are being carried forward and a Nutrient/Eutrophication Biological Indicators (for the elevated chlorophyll *a* and low DO) impairment is being added. According to the draft TMDL most of the total N load (43%) is from septic systems, with other "controllable" N contributions coming from fertilizers (20%), WWTF discharge (16%), and runoff of impervious surfaces (11%).

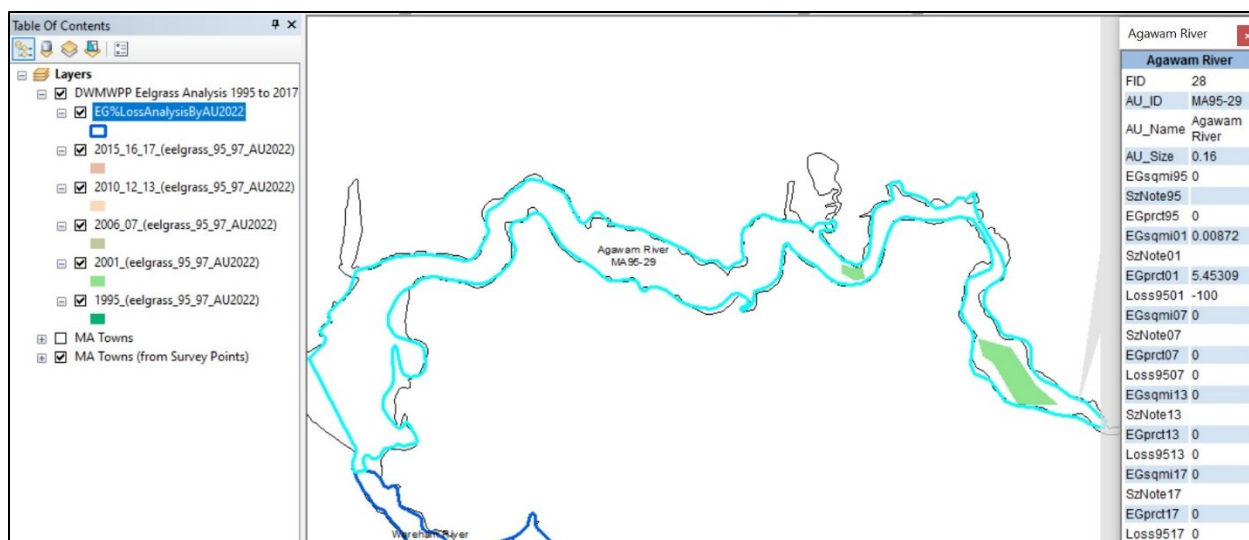
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_AG1	Buzzards Bay Coalition	Water Quality	Agawam River	Agawam River Estuary, Wareham	41.763453	-70.688604
BBC_AG2	Buzzards Bay Coalition	Water Quality	Agawam River	Agawam River Estuary, Wareham	41.763612	-70.702375

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for the Agawam River MA95-29 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented $\sim 0.01 \text{ mi}^2$ of eelgrass bed habitat in this Agawam River AU (MA95-29) only in the 2001 mapping effort. None was mapped in either 1995 or 2017.

Toxicological Monitoring Information (Ambient, Effluent, Sediment)

Wareham WWTP (MA95-29) Whole Effluent Toxicity and ambient testing information summary. (MassDEP Undated9)

Ambient

Water from the Agawam River (MA95-29) was collected on the south side of Sandwich Road (Route 6) in Wareham MA, for use as dilution water for the Wareham WWTP whole effluent toxicity tests. Between September 2015 and September 2019, survival of *M. beryllina* exposed (7-day) was excellent at $\geq 85\%$, ($n=17$).

Effluent

A total of 17 modified acute and chronic whole effluent toxicity tests were conducted on the Wareham WWTP treated effluent (outfall #001) between September 2015 and September 2019, using *M. beryllina*. There was no evidence of acute toxicity, with all $\text{LC}_{50}\text{s} > 100\%$ effluent ($n=16$ valid tests). The CNOEC results ranged from 50 to 100% effluent and all chronic tests met the CNOEC limit of $\geq 18.2\%$ effluent ($n=16$ valid tests). Results of the chronic *Arbacia punctulata* fertilization tests also met the permit limit (CNOEC results ranged from 50 to 100% effluent).

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_AG1	06/04/15	09/24/15	0.2	25	4.1	6.0	48	20	0
BBC_AG1	06/04/15	09/24/15	2.3	25	3.2	5.4	56	32	20
BBC_AG1	01/06/16	09/26/16	0.3	23	3.2	5.7	65	52	13
BBC_AG1	01/06/16	09/26/16	2.7	20	2.8	5.5	70	50	20
BBC_AG1	03/08/17	09/20/17	0.2	20	4.5	6.4	55	10	0
BBC_AG1	06/20/17	09/20/17	2.8	11	4.2	5.4	82	45	0
BBC_AG1	06/05/18	09/19/18	0.2	18	4.0	5.8	78	33	0
BBC_AG1	06/05/18	09/19/18	3.0	17	2.7	4.8	94	59	12
BBC_AG1	06/11/19	09/17/19	0.2	11	4.6	6.1	45	9	0
BBC_AG1	06/11/19	09/17/19	2.6	11	4.3	5.7	55	55	0
BBC_AG2	07/13/15	09/21/15	0.2	8	4.7	5.8	75	13	0
BBC_AG2	07/13/15	09/10/15	0.6	3	4.5	5.2	100	33	0
BBC_AG2	07/05/16	09/16/16	0.2	9	4.1	5.1	100	33	0
BBC_AG2	07/05/16	09/16/16	0.7	7	4.2	5.2	86	43	0
BBC_AG2	07/06/17	09/13/17	0.1	7	4.7	6.0	57	14	0
BBC_AG2	07/06/17	09/05/17	1.2	2	5.5	6.2	50	0	0
BBC_AG2	06/12/18	08/21/18	0.1	7	4.9	6.3	43	14	0
BBC_AG2	06/12/18	08/07/18	0.6	5	4.6	5.4	80	40	0
BBC_AG2	06/11/19	09/17/19	0.2	10	5.2	6.0	50	0	0
BBC_AG2	07/03/19	09/17/19	0.8	3	5.9	6.4	33	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_AG1	05/28/15	09/24/15	0.2	27	24	27.5	22.9	0
BBC_AG1	05/28/15	09/24/15	2.2	27	24	27.8	23.1	0
BBC_AG1	01/06/16	09/26/16	0.3	23	18	27.6	23.1	0
BBC_AG1	01/06/16	09/26/16	2.6	20	15	28.4	23.3	0
BBC_AG1	03/08/17	09/20/17	0.2	20	17	26.6	22.1	0
BBC_AG1	06/20/17	09/20/17	2.7	11	10	25.8	22.4	0
BBC_AG1	06/05/18	09/19/18	0.2	18	17	26.4	23.3	0
BBC_AG1	06/05/18	09/19/18	3.0	17	16	27.1	23.6	0
BBC_AG1	06/11/19	09/17/19	0.2	11	10	25.3	23.6	0
BBC_AG1	06/11/19	09/17/19	2.8	11	10	25.4	23.8	0
BBC_AG2	07/13/15	09/21/15	0.2	8	7	26.6	25.2	0
BBC_AG2	07/13/15	09/10/15	0.6	3	3	26.6	26.0	0
BBC_AG2	07/05/16	09/16/16	0.2	9	8	28.9	25.5	0
BBC_AG2	07/05/16	09/16/16	0.6	7	6	28.9	25.7	0
BBC_AG2	07/06/17	09/13/17	0.1	7	7	27.1	23.6	0
BBC_AG2	07/06/17	09/05/17	1.2	2	2	25.5	23.0	0
BBC_AG2	06/12/18	08/21/18	0.1	7	7	27.9	24.4	0
BBC_AG2	06/12/18	08/07/18	0.6	5	5	27.9	25.1	0
BBC_AG2	06/11/19	09/17/19	0.2	10	9	25.7	23.8	0
BBC_AG2	07/03/19	09/17/19	1.0	3	2	24.6	24.2	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_AG1	2015	0.2	7	0.19	0.61	0.44	8	4.31	39.89	16.83	1	4
BBC_AG1	2016	0.2	7	0.38	0.78	0.61	10	0.42	19.03	8.69	6	4
BBC_AG1	2017	0.2	6	0.35	1.66	0.77	9	0.91	59.85	20.83	4	5
BBC_AG1	2018	0.2	4	0.52	0.98	0.81	4	7.95	44.45	27.05	0	3
BBC_AG1	2019	0.2	3	0.37	0.52	0.45	4	4.35	11.57	7.11	1	1
BBC_AG2	2015	0.2	3	0.35	0.51	0.43	4	7.08	133.35	43.15	0	3
BBC_AG2	2016	0.2	2	0.53	0.58	0.56	4	6.83	30.16	13.86	0	2
BBC_AG2	2017	0.2	2	0.58	0.59	0.59	4	8.87	14.60	10.51	0	1
BBC_AG2	2018	0.2	4	0.45	0.90	0.60	4	2.65	35.43	14.23	2	2
BBC_AG2	2019	0.2	2	0.55	0.60	0.57	4	0.21	8.80	5.27	2	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_AG1	05/28/15	09/24/15	26	0.7	2.7	1.3
BBC_AG1	01/06/16	09/26/16	21	0.4	2.2	1.1
BBC_AG1	03/08/17	09/20/17	16	0.7	1.8	1.2
BBC_AG1	06/12/18	09/19/18	16	0.8	2.0	1.4
BBC_AG1	06/11/19	09/17/19	11	0.8	2.4	1.5
BBC_AG2	07/03/19	07/03/19	1	1.3	1.3	1.3

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_AG1	06/16/15	09/24/15	0.2	8	0.009	0.056	0.030
BBC_AG1	01/06/16	09/26/16	0.2	10	0.004	0.074	0.022
BBC_AG1	03/08/17	09/19/17	0.2	9	0.004	0.113	0.045
BBC_AG1	07/10/18	08/21/18	0.2	4	0.007	0.054	0.038
BBC_AG1	07/11/19	08/15/19	0.2	4	0.004	0.036	0.019
BBC_AG2	07/13/15	08/25/15	0.2	4	0.013	0.017	0.015
BBC_AG2	07/05/16	08/15/16	0.2	4	0.004	0.066	0.026
BBC_AG2	07/06/17	08/17/17	0.2	4	0.005	0.051	0.017
BBC_AG2	07/10/18	08/21/18	0.2	4	0.004	0.042	0.018
BBC_AG2	07/11/19	08/15/19	0.2	4	0.004	0.102	0.035

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Agawam River AU (MA95-29); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Agawam River (MA95-29): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1565 sq mi (95%). The sum of the approved, conditionally approved, and restricted shellfish growing areas represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.1565 sq mi (95%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of prohibited and approved, conditionally approved, and/or restricted. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB36.3	Wareham River	Prohibited	0.15647	95.0%

Aesthetic

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Agawam River AU (MA95-29). It will continue to be assessed as Not Supporting with the impairment for Algae being carried forward.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the status of the Primary Contact Recreation Use for this Agawam River AU (MA95-29). It will continue to be assessed as Not Supporting with the impairment for Algae being carried forward.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Agawam River (MA95-29): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1565 sq mi (95%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the status of the Secondary Contact Recreation Use for this Agawam River AU (MA95-29). It will continue to be assessed as Not Supporting with the impairment for Algae being carried forward.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

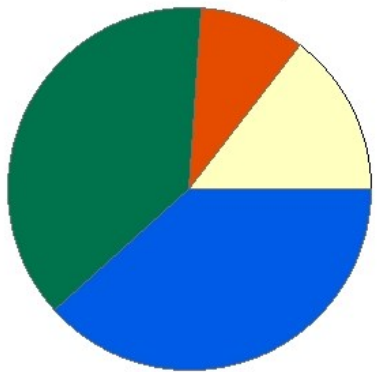
Summary
Agawam River (MA95-29): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1565 sq mi (95%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Allen Creek (MA95-97)

Location:	Headwaters outlet of wetland east of Pine Hill Road, Westport to saltwater wetland downstream of unnamed pond, west of Pine Hill Road, Westport.
AU Type:	RIVER
AU Size:	0.4 MILES
Classification/Qualifier:	B

Allen Creek - MA95-97

Watershed Area: 0.42 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.42	0.42	0.11	0.11
Agriculture	14.6%	14.6%	25.5%	25.5%
Developed	9.4%	9.4%	8.8%	8.8%
Natural	37.6%	37.6%	38.9%	38.9%
Wetland	38.4%	38.4%	26.7%	26.7%
Impervious Cover	2.9%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	5	Escherichia Coli (E. Coli)		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Escherichia Coli (E. Coli)	Source Unknown (N)				X	

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	

MassDEP staff did not observe any dense film or filamentous algae in Allen Creek at Pine Hill Rd, Westport (W2368), during summer surveys conducted as part of the MassDEP Bacteria Source Tracking (BST) project in either 2012 or 2013 (n=3 for both years).
Too limited data are available so the Aquatic Life Use for Allen Creek (MA95-97) is assessed as having Insufficient Information.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2368	MassDEP	Water Quality	Allen Creek	[Pine Hill Road, Westport]	41.582267	-71.059791

Physico-chemical Water Quality Information

Nutrients (Primary Producer Screening, Physico-chemical Screening)

MassDEP Nutrient Enrichment Indicator Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	Delta DO Max (mg/L)	Delta DO Avg (mg/L)	DO Sat Max (%)	pH Max (SU)	Count Algal Obsv.	Dense/V. Dense Film/Fila. Algae
W2368	2012	--	--	--	--	--	--	--	--	3	0
W2368	2013	--	--	--	--	--	--	--	--	3	0

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Allen Creek (MA95-97); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
MassDEP staff recorded aesthetics observations in Allen Creek at Pine Hill Road in Westport (W2368) during the summers of 2012 and 2013 (n=3 for both). There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during either summer. The Aesthetics Use for Allen Creek (MA95-97) is assessed as Fully Supporting based on the lack of objectionable conditions noted during the summers of 2012 and 2013.	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2368	MassDEP	Water Quality	Allen Creek	[Pine Hill Road, Westport]	41.582267	-71.059791

*Aesthetic Observations***Aesthetics Summary Statements for MassDEP Stations (2011-2018)** (MassDEP Undated6)

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W2368	Allen Creek	2012	3	MassDEP aesthetics observations for station W2368 on Allen Creek can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2012.
W2368	Allen Creek	2013	3	MassDEP aesthetics observations for station W2368 on Allen Creek can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013.

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W2368	2012	3	3	0
W2368	2013	3	3	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W2368	Allen Creek	2012	Color	Brownish	2	3
W2368	Allen Creek	2012	Color	None	1	3
W2368	Allen Creek	2012	Objectionable Deposits	Not Applicable (N/A)	3	3
W2368	Allen Creek	2012	Odor	None	3	3
W2368	Allen Creek	2012	Scum	Not Applicable (N/A)	3	3
W2368	Allen Creek	2012	Turbidity	Slightly Turbid	3	3
W2368	Allen Creek	2013	Color	Brownish	2	3
W2368	Allen Creek	2013	Color	None	1	3
W2368	Allen Creek	2013	Objectionable Deposits	Not Applicable (N/A)	3	3
W2368	Allen Creek	2013	Odor	None	3	3
W2368	Allen Creek	2013	Scum	Not Applicable (N/A)	3	3
W2368	Allen Creek	2013	Turbidity	Slightly Turbid	3	3

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

MassDEP staff collected *E. coli* bacteria samples in Allen Creek (MA95-97) as part the MassDEP Bacteria Source Tracking (BST) project at Pine Hill Road in Westport (W2368) between June and September 2012 (n=3) and between June and August 2013 (n=3). The available bacteria data in 2012 are too limited to assess the Primary Contact Recreational Use according to the CALM "Use Attainment Impairment Decision Schema", though it should be noted that one sample exceeded the 410 cfu/100ml STV (a maximum of 1990 cfu/100ml) and the seasonal geomean was 395 cfu/100ml. Analysis of the 2013 data (single year limited frequency) indicated that 100% of intervals had GM's >126 cfu/100 ml and one sample exceeded the 410 cfu/100 ml STV, with a seasonal geomean of 151 cfu/100ml. The Primary Contact Recreational Use for Allen Creek (MA95-97) is assessed as Not Supporting based on the elevated *E.coli* documented on Pine Hill Rd, Westport by MassDEP staff in 2012 and 2013.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2368	MassDEP	Water Quality	Allen Creek	[Pine Hill Road, Westport]	41.582267	-71.059791

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP

Undated11) (MassDEP Undated6)

[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
W2368	MassDEP	E. coli	06/20/12	09/24/12	3	80	1990	395
W2368	MassDEP	E. coli	06/18/13	08/20/13	3	20	770	151

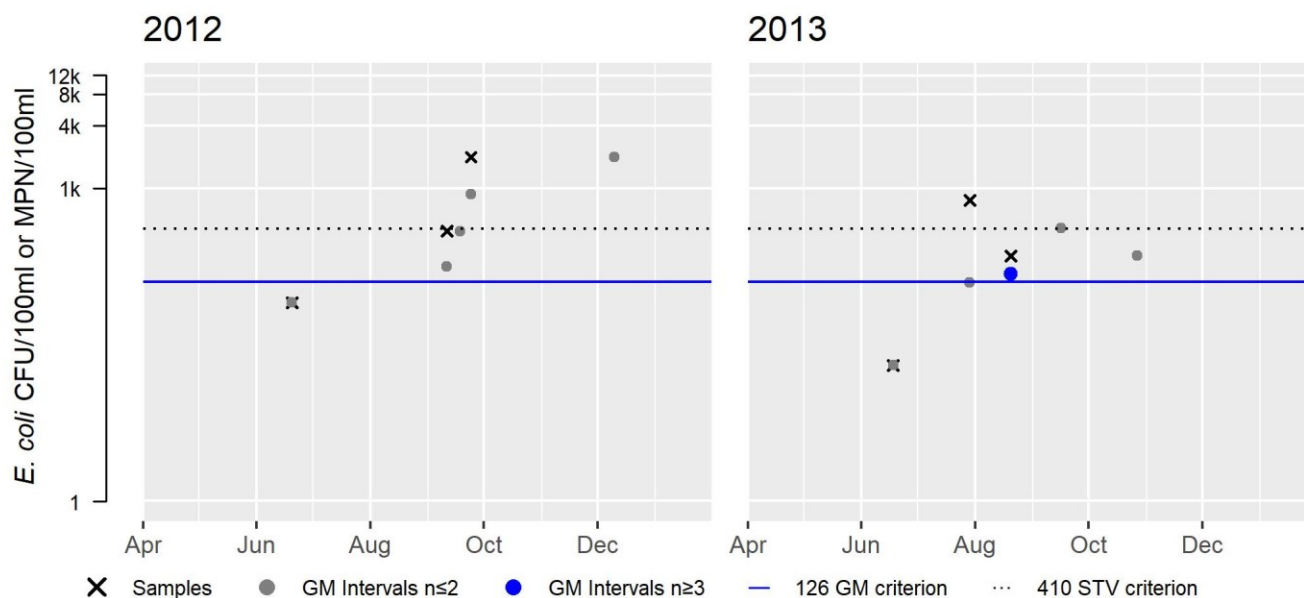
W2368 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	395
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	33

Var	Res
Samples	3
SeasGM	151
#GMI	1
#GMI Ex	1
%GMI Ex	100
n>STV	1
%n>STV	33

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

Variable	Cumulative %GMI Ex (all years)
Result	100



Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff collected <i>E. coli</i> bacteria samples from Allen Creek (MA95-97) as part the MassDEP Bacteria Source Tracking (BST) project at Pine Hill Road in Westport (W2368) between June and September 2012 (n=3) and between June and August 2013 (n=3). The available bacteria data in 2012 are too limited to assess the Secondary Contact Recreational Use according to the CALM "Use Attainment Impairment Decision Schema", though it should be noted that one sample exceeded the 1260 cfu/100ml STV (a maximum of 1990 cfu/100ml) and the seasonal geomean was 395 cfu/100ml. Analysis of the 2013 data (single year limited frequency) indicated that 0% of intervals had GM's >630 cfu/100 ml and no samples exceeded the 1260 cfu/100 ml STV, with a seasonal geomean of 151 cfu/100ml. Since the <i>E. coli</i> concentrations were below the use attainment impairment thresholds for this single year limited frequency dataset (2013), the Secondary Contact Recreational Use for Allen Creek is assessed as Fully Supporting.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2368	MassDEP	Water Quality	Allen Creek	[Pine Hill Road, Westport]	41.582267	-71.059791

*Bacteria Data***Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP**

Undated11) (MassDEP Undated6)

[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
W2368	MassDEP	E. coli	06/20/12	09/24/12	3	80	1990	395
W2368	MassDEP	E. coli	06/18/13	08/20/13	3	20	770	151

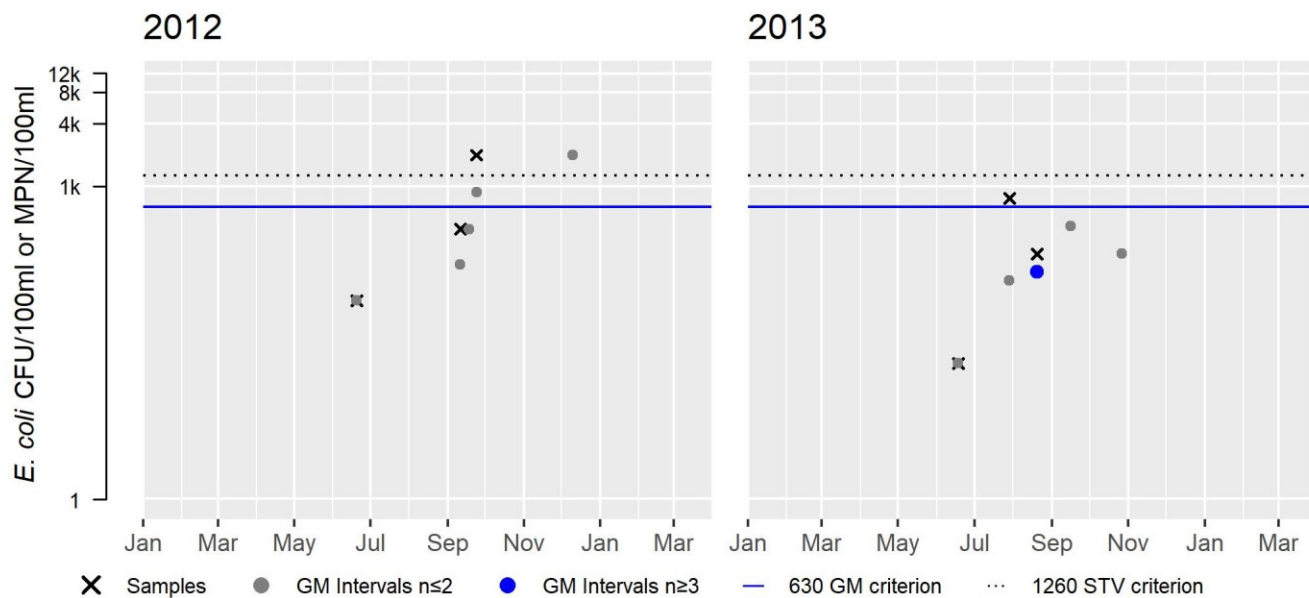
W2368 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	395
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	33

Var	Res
Samples	3
SeasGM	151
#GMI	1
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

Variable	Cumulative %GMI Ex (all years)
Result	0



Allens Pond (MA95-107)

Location:	south of Allens Neck Road, Dartmouth.
AU Type:	ESTUARY
AU Size:	0.31 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	5	Dissolved Oxygen		Added
--	5	Nitrogen, Total		Added
--	5	Nutrient/Eutrophication Biological Indicators		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Source Unknown (N)	X					
Nitrogen, Total	Source Unknown (N)	X					
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)	X					

Recommendations

2022 Recommendations
ALU: Determine if there is a deep hole station that could be added to the current BBC sampling locations in Allens Pond (MA95-107) to improve sampling station representativeness.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring in the surface waters of Allens Pond, Dartmouth (MA95-107) at three locations; two within the inlet/outlet channel with Buzzards Bay (BBC_AP1) (BBC_AP1A) and one at the innermost west end of the pond (BBC_AP2), usually weekly (between the hours of 6 and 9am) in the summers of 2015-2019. The maximum temperature was 29.0°C (n=143). The minimum dissolved oxygen was 1.5mg/L (n=108), frequently < 5.0mg/L at all three sample locations. Nutrient sampling efforts (ebb tides in July and August) included total nitrogen (n=13, maximum 0.74mg/L) with seasonal average total nitrogen concentrations between 0.3-0.43mg/L in 2015, 2017, and 2018 at the inlet channel stations (BBC_AP1 and AP1A) and a seasonal average of 0.87mg/L in 2018 at the west end of the Pond (BBC_AP2) (n=10, maximum 2.18mg/L). Chlorophyll *a* concentrations were usually <10µg/L at the inlet channel stations (n=19), with the exception of two occasions in 2019 when the maximum was 20.5µg/L; however, at the west end of the Pond (n=18) a maximum of 56µg/L was documented in 2015 and concentrations were >10µg/L the majority of the time, with seasonal averages ranging 10.5-31µg/L. Secchi disk depth in July 2017 was 0.6m at the west end of the Pond (BBC_AP2). Ammonia-nitrogen concentrations ranged from 0.003 to 0.07mg/L (n=38), but TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use of Allens Pond (MA95-107) is assessed as Not Supporting based on evidence of nutrient enrichment (low Dissolved Oxygen, elevated Total Nitrogen and Chlorophyll *a*), documented at the west end of the pond by BBC staff/volunteers between 2015 and 2019. Impairments for Nutrient/Enrichment Biological Indicators, Dissolved Oxygen, and Total Nitrogen are being added, in agreement with the BBC comments made on the 2018/20 IR.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_AP1	Buzzards Bay Coalition	Water Quality	Allens Pond	Allens Pond, Dartmouth	41.513377	-70.996946
BBC_AP1A	Buzzards Bay Coalition	Water Quality	Allens Pond	Allens Pond, Dartmouth	41.512269	-71.006289
BBC_AP2	Buzzards Bay Coalition	Water Quality	Allens Pond	Allens Pond, Dartmouth	41.510572	-71.022158

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_AP1	06/09/15	08/25/15	0.1	13	2.0	4.3	62	62	54
BBC_AP1	06/11/16	08/17/16	0.2	2	7.0	7.3	0	0	0
BBC_AP1	06/20/18	09/05/18	0.2	16	1.5	5.7	50	19	6
BBC_AP1A	06/16/17	08/31/17	0.2	8	2.0	5.6	63	25	25
BBC_AP1A	06/10/19	09/17/19	0.2	15	2.0	6.5	33	20	13
BBC_AP2	06/09/15	08/25/15	0.1	12	1.5	4.0	75	67	42
BBC_AP2	06/11/16	08/17/16	0.2	2	4.0	5.3	50	50	0
BBC_AP2	06/16/17	08/31/17	0.2	8	1.5	3.6	88	88	50
BBC_AP2	06/20/18	09/05/18	0.2	16	1.5	3.6	94	81	56
BBC_AP2	06/10/19	09/17/19	0.2	16	2.0	5.3	63	56	31

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_AP1	06/09/15	08/25/15	0.1	13	13	24.0	20.1	0
BBC_AP1	06/11/16	08/17/16	0.2	2	2	26.0	21.5	0
BBC_AP1	06/20/18	08/30/18	0.1	18	18	25.0	23.1	0
BBC_AP1A	07/13/15	08/25/15	0.1	4	4	24.0	22.3	0
BBC_AP1A	07/18/16	08/15/16	0.2	3	3	29.0	25.0	0
BBC_AP1A	06/16/17	08/31/17	0.2	13	13	24.4	21.1	0
BBC_AP1A	06/10/19	09/17/19	0.1	19	18	26.0	21.9	0
BBC_AP2	06/09/15	08/25/15	0.1	16	16	25.0	21.6	0
BBC_AP2	06/11/16	08/17/16	0.2	5	5	29.0	24.4	0
BBC_AP2	06/16/17	08/31/17	0.2	13	13	26.7	22.9	0
BBC_AP2	06/20/18	09/05/18	0.1	19	19	27.0	24.7	0
BBC_AP2	06/10/19	09/17/19	0.2	20	19	28.0	23.9	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_AP1	2018	0.2	4	0.28	0.49	0.35	4	1.15	6.61	4.15	2	0
BBC_AP1A	2015	0.1	3	0.23	0.74	0.43	4	2.24	5.35	3.24	3	0
BBC_AP1A	2016	0.2	2	0.25	0.35	0.30	3	1.18	4.51	2.70	3	0
BBC_AP1A	2017	0.2	3	0.32	0.42	0.36	4	2.41	3.90	3.21	4	0
BBC_AP1A	2019	0.2	1	0.32	0.32	0.32	4	1.75	20.53	9.96	2	2
BBC_AP2	2015	0.1	1	1.43	1.43	1.43	3	7.10	56.00	30.97	0	2
BBC_AP2	2016	0.2	1	2.18	2.18	2.18	3	16.81	31.34	22.01	0	3
BBC_AP2	2017	0.2	2	0.94	2.05	1.49	4	12.21	28.14	17.17	0	4
BBC_AP2	2018	0.2	4	0.58	1.25	0.87	4	5.84	17.06	10.48	0	2
BBC_AP2	2019	0.2	2	0.75	1.24	1.00	4	7.82	18.68	14.40	0	3

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_AP2	07/20/17	07/20/17	1	0.6	0.6	0.6

Public comment submitted by Buzzards Bay Coalition as part of the 2018/20 IR

A. Allens Pond Fails to Meet State Water Quality Standards and Must be Listed as Impaired for Total Nitrogen on the 2018/2020 List of Category 5 Waters.

The Coalition requests that Allens Pond, in the town of Dartmouth be listed as impaired for total nitrogen. The Coalition's water quality monitoring data support its listing.



Figure 1. Allens Pond Site Map

Allens Pond demonstrates water quality decline related to excess nutrients. Excessive levels of nitrogen are common in southeastern Massachusetts and result in ecosystem degradation with impacts including loss of eelgrass beds, algae blooms, fish kills and reductions in important marine life. In order to target areas that are suffering from excessive levels nitrogen, like Allens Pond, and remove as much nitrogen as possible from these areas, it is imperative that MassDEP list Allens Pond as impaired for total nitrogen, requiring a TMDL for nitrogen.

1. Allens Pond Dissolved Oxygen

The Coalition submits multiple years of oxygen data taken from sites AP1, AP1A, AP2, and AP2A depicting water quality impairment due to nutrient over-enrichment. The Coalition's dissolved oxygen data show that Allens Pond consistently falls below the numeric criteria of 6 mg/L as designated in 314 CMR 4.05(4)(a)(1)(a) and warrants listing on the 303(d) list.

² Total Maximum Daily Load (TMDL) Basics. <https://www.mass.gov/guides/the-basics-of-total-maximum-daily-loads-tmdls>

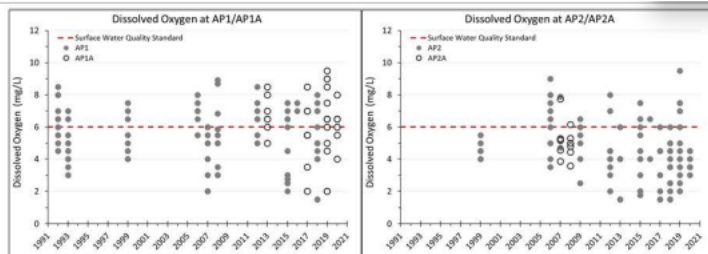


Figure 2. Dissolved Oxygen Concentrations in Allens Pond

The dissolved oxygen concentrations in Figure 2 clearly shows a majority of samples below the numeric dissolved oxygen criteria established in the Massachusetts Surface Water Quality Standards.

2. Allens Pond Chlorophyll Data

The Coalition's chlorophyll data show that Allens Pond does not possess the excellent aesthetic values required of SA waters pursuant to 314 CMR 4.05(4)(a), "These waters shall have excellent aesthetic value" and warrants listing on the 303(d) list.

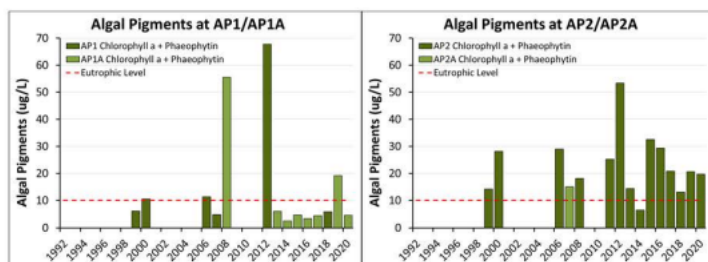


Figure 3. Phytoplankton Pigments in Allens Pond

The phytoplankton pigment data presented in Figure 3 show very high concentrations, with the annual average of total algal pigments being above 10 mg/L at station AP2/AP2A for all but one year. The high concentrations of chlorophyll indicate degraded water clarity in violation of the excellent aesthetic value required in Massachusetts Surface Water Quality Standards.

3. Allens Pond Total Nitrogen Data

The Coalition's total nitrogen data for Allens Pond (Figure 4) demonstrates total nitrogen concentrations that are quite high, in some years reaching over 2 mg/L. Excess nitrogen levels

will cause low dissolved oxygen numbers and promote algae growth, results that are illustrated above. The incidences of high total nitrogen concentration and high chlorophyll indicate that Allens Pond fails to attain state water quality standards and must be listed on the 303(d) list as impaired for total nitrogen.

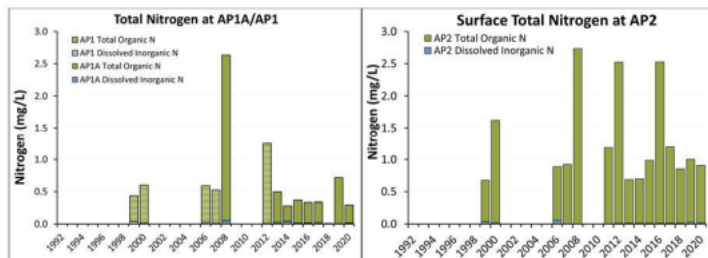


Figure 4. Total Nitrogen in Allens Pond

In summary, the dissolved oxygen data at sampling sites AP1, AP1A, AP2 and AP2A are in clear violation of surface water quality standards, falling below dissolved oxygen levels of 6 mg/L. Elevated chlorophyll levels that degrade water clarity and aesthetic value, as well as total nitrogen concentrations that can be very high are also evident. **The data above show that Allens Pond is suffering from eutrophication due to excess nutrients and must be listed on the Commonwealth of Massachusetts' 303(d) list of Category 5 waters requiring a TMDL for total nitrogen.**

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_AP1	07/10/18	08/21/18	0.2	4	0.003	0.020	0.010
BBC_AP1A	07/13/15	08/25/15	0.1	4	0.014	0.020	0.017
BBC_AP1A	07/18/16	08/15/16	0.2	3	0.006	0.033	0.018
BBC_AP1A	07/06/17	08/17/17	0.2	4	0.012	0.032	0.020
BBC_AP1A	07/11/19	08/15/19	0.2	4	0.004	0.008	0.005
BBC_AP2	07/13/15	08/25/15	0.1	4	0.007	0.017	0.012
BBC_AP2	07/18/16	08/15/16	0.2	3	0.007	0.033	0.016
BBC_AP2	07/06/17	08/17/17	0.2	4	0.005	0.022	0.010
BBC_AP2	07/10/18	08/21/18	0.2	4	0.006	0.025	0.015
BBC_AP2	07/11/19	08/15/19	0.2	4	0.010	0.066	0.028

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Allens Pond (MA95-107); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Insufficient Information	YES
2022 Use Attainment Summary	
Allens Pond (MA95-107): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2531 sq mi (82%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.2531 sq mi (82%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area >= 0.0001 sq mi.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB5.0	Little Beach Coastal	Approved	0.00001	0.0%
BB6.0	Allens Pond	Prohibited	0.25313	82.0%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Allens Pond (MA95-107) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Allens Pond (MA95-107) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Allens Pond (MA95-107): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2531 sq mi (82%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Allens Pond (MA95-107) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

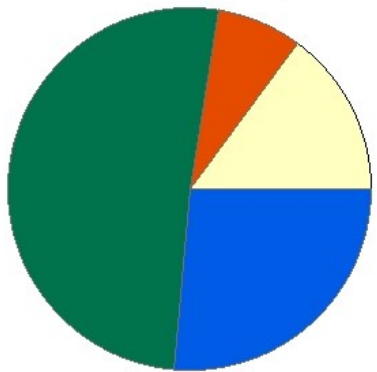
Summary
Allens Pond (MA95-107): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2531 sq mi (82%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Angeline Brook (MA95-83)

Location:	Perennial portion south of Charlotte White Road, Westport to mouth at West Branch Westport River (Angeline Cove), Westport.
AU Type:	RIVER
AU Size:	4.4 MILES
Classification/Qualifier:	B

ANGELINE BROOK - MA95-83

Watershed Area: 3.46 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.46	2.79	1.49	1.22
Agriculture	14.9%	18.1%	9.4%	11.4%
Developed	7.5%	7.6%	2.8%	3.3%
Natural	51.2%	50.9%	45.4%	47.4%
Wetland	26.4%	23.4%	42.4%	37.9%
Impervious Cover	3.1%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Enterococcus		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Enterococcus	Source Unknown (N)				X	

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	

MA DFG biologists conducted backpack electrofishing at two sites along Angeline Brook (MA95-83) (identified by DFG biologists as a CFR); at a path through a farm field north of Adamsville Rd, Westport (SampleID 5626) in October 2015 and below Cornell Rd, Westport (SampleID 5911) in July 2016. North of Adamsville Rd the sample was comprised of only eight individuals, all being the moderately tolerant macrohabitat generalist redbfin pickerel. Further downstream at Cornell Rd over half (58%) of the sample consisted of multiple age classes of Eastern brook trout. American eel, redbfin pickerel and pumpkinseed were also collected.

The Aquatic Life Use of Angeline Brook (MA95-83) will continue to be assessed as Fully Supporting based on the presence of cold water fish species downstream of Cornell Rd in July 2016, which is indicative of excellent habitat and water quality conditions.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
5626	MassDFG	Fish Community	Angeline Brook	Path through farm field north of Adamsville Rd, Westport	41.57606	-71.09634
5911	MassDFG	Fish Community	Angeline Brook	Below Cornell Road, Westport	41.54937	-71.10503

Biological Monitoring Information

Fish Community Data and DELTS

Fish Community Data (2012-2019) Provided by MassDFG. (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net]

[Species List: AE = American Eel, EBT = Brook Trout, P = Pumpkinseed, RP = Redfin Pickerel]

Sample ID	Sample Date	Method	Sample Type	Total Taxa	Total Ind	EBT Ind	EBT Min Length (mm)	EBT Max Length (mm)	EBT ≤140mm Ind	SC Ind	Cold Ind %	Fluvial Ind %	Notables	CFR	Species List
5911	07/08/16	BP	TP	4	261	151	94	261	2	0	58%	58%	No	Yes	AE, EBT, P, RP,

Fish Community Data (2012-2019) Provided by MassDFG. (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net, Gradient: H = High, L = Low; I/MT MG= Intolerant/Moderately Tolerant Macrohabitat Generalist]

[Species List: RP = Redfin Pickerel]

Sample ID	Sample Date	Method	Sample Type	Gradient	Total Taxa	Total Ind	Cold Ind %	Fluvial Taxa	Fluvial Ind %	Intol Ind %	I/MT MG Taxa	I/MT MG Ind %	Notables	CFR	Species List
5626	10/01/15	BP	TP		1	8	0%	0	0%	0%	1	100%	Yes	Yes	RP,

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	

No fish toxics monitoring has been conducted in Angeline Brook (MA95-83); therefore, the Fish Consumption Use is Not Assessed.

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Angeline Brook (MA95-83) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No <i>Enterococcus</i> or <i>E. coli</i> bacteria data are available to assess the status of the Primary Contact Recreation Use for Angeline Brook (MA95-83), so it will continue to be assessed as Not Supporting with the <i>Enterococcus</i> impairment being carried forward.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E. coli</i> bacteria data are available to assess the status of the Secondary Contact Recreation Use for Angeline Brook (MA95-83) so it is Not Assessed.	

Apponagansett Bay (MA95-39)

Location:	From the mouth of Buttonwood Brook, Dartmouth to a line drawn from Ricketsons Point, Dartmouth to Samoset Street near North Avenue, Dartmouth.
AU Type:	ESTUARY
AU Size:	1.06 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Dissolved Oxygen		Added
5	5	Estuarine Bioassessments		Unchanged
5	5	Fecal Coliform	36172	Unchanged
5	5	Nitrogen, Total		Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
5	5	PCBs in Fish Tissue		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Source Unknown (N)	X					
Estuarine Bioassessments	Impervious Surface/Parking Lot Runoff (N)	X					
Estuarine Bioassessments	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (N)	X					
Estuarine Bioassessments	Residential Districts (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Impervious Surface/Parking Lot Runoff (N)	X					
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (N)	X					
Nitrogen, Total	Residential Districts (N)	X					
Nutrient/Eutrophication Biological Indicators	Impervious Surface/Parking Lot Runoff (N)	X					
Nutrient/Eutrophication Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (N)	X					
Nutrient/Eutrophication Biological Indicators	Residential Districts (N)	X					
PCBs in Fish Tissue	CERCLA NPL (Superfund) Sites (Y)		X				
PCBs in Fish Tissue	Contaminated Sediments (Y)		X				

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>The MassDEP Eelgrass Mapping Project documented an ~16% loss of eelgrass bed habitat in Apponagansett Bay between 1995 and 2017. Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at seven locations throughout Apponagansett Bay, Dartmouth (MA95-39) in the summers of 2015-2019, from inner to outer as follows: BBC_AB1, AB4, AB3, AB2, AB6, AB6A, and AB7. Most sample stations were close to shore (from jetties, docks and piers), with the exception of BBC_AB4 and AB7. Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column (at depths ranging 0.7m at BBC_AB1 to 2.4m at BBC_AB7) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 28.0°C (n=826). The minimum dissolved oxygen (DO) was 1.3mg/L (an anomaly which occurred at BBC_AB1 at a depth of 0.55m in 2018), although DO measured <6.0mg/L 286 times (35% of all measurements) and <5.0mg/L 77 times (9.5% of all measurements) (n=810) with low DO occurring most frequently at the inner and mid-bay sample stations (BBC_AB1, AB2, and AB3) at a range of depths including surface waters. Nutrient sampling efforts (ebb tides in July and August at BBC_AB2, AB3, AB4, and AB6) documented a maximum total nitrogen concentration of 1.12mg/L (n=55) with seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.35-0.79mg/L. The Chlorophyll <i>a</i> maximum was 20.88µg/L (n=89), >5µg/L 61 times with concentrations >10µg/L documented at least once or twice a year for at least one or two of the sample stations in 2015, 2016, and 2017 (12 occasions in total). Secchi disk depths ranged from 0.6 to 3.5m throughout the bay (n=269). Ammonia-nitrogen concentrations ranged from 0.004 to 0.26mg/L (n=88, >0.2mg/L at BBC_AB4 once in 2019), but TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for Apponagansett Bay (MA95-39) will continue to be assessed as Not Supporting, based on the loss of eelgrass bed habitat documented by MassDEP between 1995 and 2017 and the water quality data collected by BBC staff/volunteers in 2015-2019. The Estuarine Bioassessments, Nitrogen, Total, and Nutrient/Eutrophication Biological Indicators impairments are all being carried forward. An impairment for Dissolved Oxygen is being added due to frequently low concentrations documented by BBC, particularly in the inner and mid-bay areas of the AU.</p>	

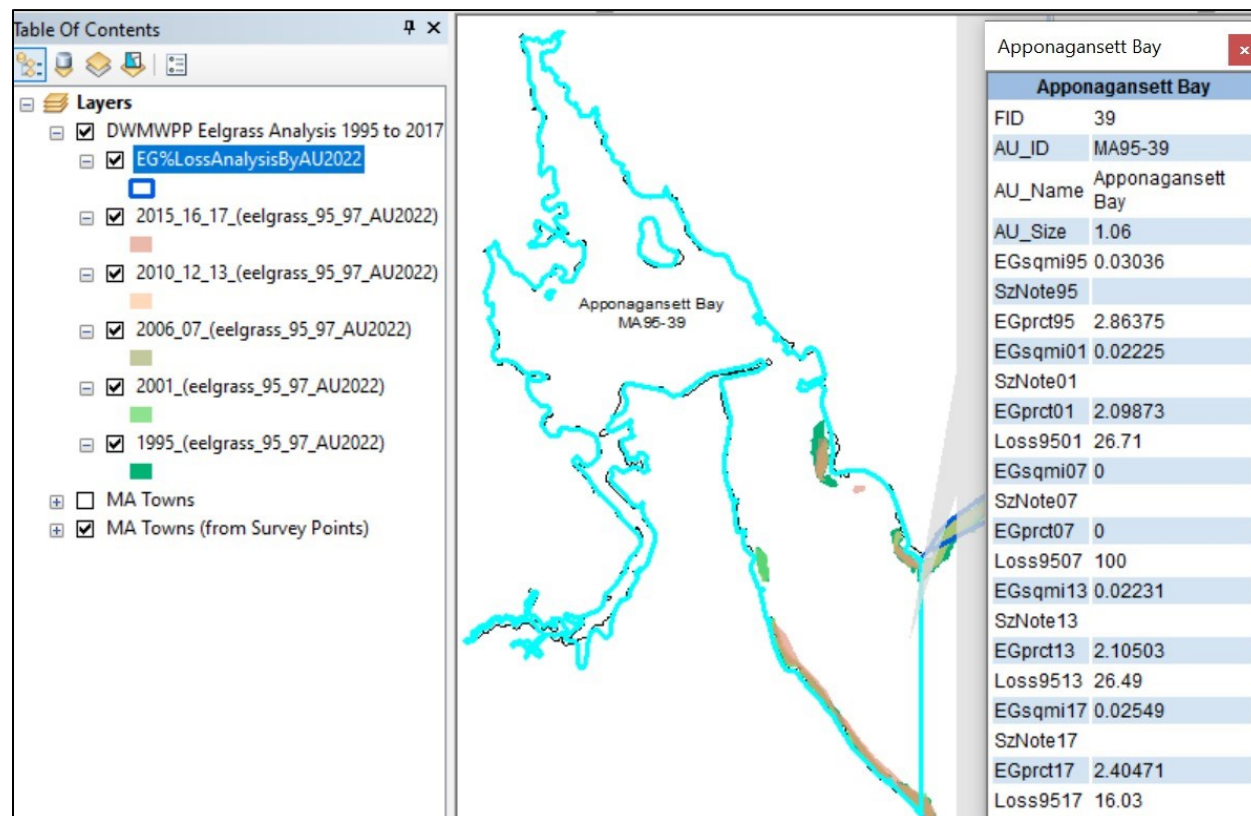
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_AB1	Buzzards Bay Coalition	Water Quality	Apponagansett Bay	Apponagansett Bay Inner, Dartmouth	41.594438	-70.955999
BBC_AB2	Buzzards Bay Coalition	Water Quality	Apponagansett Bay	Apponagansett Bay Outer, Dartmouth	41.583514	-70.944682
BBC_AB3	Buzzards Bay Coalition	Water Quality	Apponagansett Bay	Apponagansett Bay Mid, Dartmouth	41.58495	-70.952918
BBC_AB4	Buzzards Bay Coalition	Water Quality	Apponagansett Bay	Apponagansett Bay Inner, Dartmouth	41.592358	-70.955519
BBC_AB6	Buzzards Bay Coalition	Water Quality	Apponagansett Bay	Apponagansett Bay Outer, Dartmouth	41.578519	-70.948343
BBC_AB6A	Buzzards Bay Coalition	Water Quality	Apponagansett Bay	Apponagansett Bay Outer, Dartmouth	41.57439	-70.946942
BBC_AB7	Buzzards Bay Coalition	Water Quality	Apponagansett Bay	Apponagansett Bay Outer, Dartmouth	41.5759	-70.939742

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Apponagansett Bay MA95-39 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~16% loss of eelgrass bed habitat in Apponagansett Bay between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_AB1	06/04/15	09/24/15	0.2	18	4.0	5.8	56	6	0
BBC_AB1	06/16/15	09/24/15	0.9	14	4.0	5.6	57	7	0
BBC_AB1	06/16/16	09/17/16	0.2	4	5.5	6.3	50	0	0
BBC_AB1	06/07/16	09/24/16	0.7	16	4.5	6.0	38	6	0
BBC_AB1	06/06/17	09/16/17	0.2	5	5.0	5.9	40	0	0
BBC_AB1	06/06/17	09/20/17	0.8	14	5.0	6.2	29	0	0
BBC_AB1	06/11/18	06/11/18	0.2	1	6.0	6.0	0	0	0
BBC_AB1	06/05/18	09/19/18	0.8	18	1.3	4.8	78	50	11
BBC_AB1	05/30/19	09/14/19	0.2	7	4.5	6.1	29	14	0
BBC_AB1	05/30/19	09/23/19	0.9	19	3.5	6.2	37	16	5
BBC_AB2	06/17/15	09/19/15	0.2	15	4.0	6.2	27	7	0
BBC_AB2	06/17/15	09/19/15	1.8	16	4.0	6.1	38	25	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_AB2	06/01/16	09/25/16	0.2	17	3.5	5.5	65	24	6
BBC_AB2	06/01/16	09/25/16	1.7	17	3.0	5.6	76	12	6
BBC_AB2	07/21/17	09/17/17	0.2	10	3.0	5.0	70	30	20
BBC_AB2	07/21/17	09/17/17	1.6	10	4.5	5.5	70	10	0
BBC_AB2	06/15/18	09/15/18	0.2	18	5.5	6.7	6	0	0
BBC_AB2	06/15/18	09/11/18	1.6	17	5.0	6.6	18	0	0
BBC_AB2	06/05/19	09/17/19	0.2	15	4.6	6.5	13	7	0
BBC_AB2	06/05/19	09/17/19	1.7	15	4.4	6.5	13	7	0
BBC_AB3	06/17/15	09/24/15	0.2	11	4.0	5.6	55	18	0
BBC_AB3	06/17/15	09/24/15	1.2	13	5.0	6.0	23	0	0
BBC_AB3	06/12/16	09/18/16	0.2	14	4.5	5.3	79	14	0
BBC_AB3	06/12/16	09/24/16	1.2	18	4.0	5.3	72	22	0
BBC_AB3	06/07/17	09/16/17	0.2	13	4.0	5.3	77	15	0
BBC_AB3	06/07/17	09/16/17	1.2	18	4.0	5.3	83	11	0
BBC_AB3	06/27/18	09/19/18	0.2	8	4.5	4.9	88	50	0
BBC_AB3	06/05/18	09/19/18	1.0	21	4.5	5.4	67	10	0
BBC_AB3	06/05/19	09/23/19	0.2	14	5.0	5.8	50	0	0
BBC_AB3	06/05/19	09/23/19	1.3	19	4.0	5.7	42	16	0
BBC_AB4	05/28/15	09/22/15	0.2	18	4.7	6.3	50	6	0
BBC_AB4	05/28/15	09/22/15	1.5	18	4.4	5.9	67	6	0
BBC_AB4	05/31/16	09/24/16	0.2	18	4.6	6.2	39	11	0
BBC_AB4	05/31/16	09/24/16	1.2	18	4.3	5.9	44	17	0
BBC_AB4	06/12/17	09/05/17	0.2	15	5.0	6.8	7	0	0
BBC_AB4	06/12/17	09/05/17	1.4	15	5.3	6.6	20	0	0
BBC_AB4	06/01/18	09/20/18	0.2	15	4.8	6.1	40	13	0
BBC_AB4	06/01/18	09/20/18	0.9	15	4.5	5.9	53	20	0
BBC_AB4	06/27/19	09/18/19	0.4	8	4.8	6.0	38	25	0
BBC_AB4	07/02/19	09/18/19	1.1	6	4.6	5.8	50	17	0
BBC_AB6A	06/05/15	09/24/15	0.3	18	6.0	7.4	0	0	0
BBC_AB6A	06/05/15	09/24/15	1.6	17	5.5	7.4	6	0	0
BBC_AB6A	06/01/16	09/18/16	0.2	18	5.0	6.6	11	0	0
BBC_AB6A	06/01/16	09/24/16	1.4	20	5.0	6.4	20	0	0
BBC_AB6A	05/31/17	09/17/17	0.2	19	6.0	7.2	0	0	0
BBC_AB6A	05/31/17	09/17/17	1.5	19	5.5	7.3	5	0	0
BBC_AB6A	06/11/18	09/20/18	0.2	13	4.3	6.1	31	15	0
BBC_AB6A	06/11/18	09/20/18	1.7	13	4.1	5.9	46	23	0
BBC_AB7	06/04/15	09/23/15	0.3	17	6.5	8.1	0	0	0
BBC_AB7	06/04/15	09/23/15	2.4	15	6.5	7.9	0	0	0
BBC_AB7	06/07/16	09/21/16	0.2	14	6.0	7.0	0	0	0
BBC_AB7	06/07/16	09/21/16	2.4	13	6.0	6.9	0	0	0
BBC_AB7	06/17/17	09/16/17	0.2	14	7.0	9.3	0	0	0
BBC_AB7	06/17/17	09/12/17	2.4	13	6.5	8.8	0	0	0
BBC_AB7	05/29/18	09/15/18	0.2	13	7.0	8.1	0	0	0
BBC_AB7	05/29/18	09/15/18	2.4	13	7.0	7.8	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_AB1	05/28/15	09/24/15	0.2	19	16	25.0	21.3	0
BBC_AB1	06/16/15	09/24/15	0.9	14	13	25.0	22.2	0
BBC_AB1	06/16/16	09/17/16	0.2	4	3	25.0	22.4	0
BBC_AB1	06/06/16	09/24/16	0.7	17	14	25.0	21.1	0
BBC_AB1	06/06/17	09/16/17	0.2	5	4	25.7	20.1	0
BBC_AB1	06/06/17	09/20/17	0.8	14	12	25.8	20.7	0
BBC_AB1	06/11/18	06/11/18	0.2	1	1	18.2	18.2	0
BBC_AB1	06/05/18	09/19/18	0.7	17	16	26.0	22.5	0
BBC_AB1	05/30/19	09/14/19	0.2	8	7	28.0	23.3	0
BBC_AB1	05/30/19	09/23/19	0.9	19	16	28.0	23.9	0
BBC_AB2	06/17/15	09/19/15	0.2	19	18	25.0	22.0	0
BBC_AB2	06/17/15	09/19/15	1.8	16	15	24.1	21.5	0
BBC_AB2	06/01/16	09/25/16	0.2	21	19	27.0	23.2	0
BBC_AB2	06/01/16	09/25/16	1.7	17	15	26.0	22.4	0
BBC_AB2	07/06/17	09/12/17	0.2	14	14	25.8	22.1	0
BBC_AB2	07/28/17	09/12/17	1.5	8	8	22.8	21.0	0
BBC_AB2	06/15/18	09/15/18	0.2	21	21	26.0	23.6	0
BBC_AB2	06/15/18	09/15/18	1.6	18	18	25.0	23.4	0
BBC_AB2	06/05/19	09/17/19	0.2	19	18	24.9	22.0	0
BBC_AB2	06/05/19	09/17/19	1.7	15	14	24.7	21.4	0
BBC_AB3	06/17/15	09/24/15	0.2	15	13	25.0	22.8	0
BBC_AB3	06/17/15	09/24/15	1.2	18	16	26.0	23.0	0
BBC_AB3	06/12/16	09/18/16	0.2	19	18	26.0	22.3	0
BBC_AB3	06/12/16	09/24/16	1.2	22	20	27.0	22.4	0
BBC_AB3	06/07/17	09/16/17	0.2	18	17	25.5	22.3	0
BBC_AB3	06/07/17	09/16/17	1.2	22	21	25.4	21.8	0
BBC_AB3	06/27/18	09/19/18	0.2	10	9	25.2	23.5	0
BBC_AB3	06/05/18	09/19/18	1.0	23	22	26.0	21.8	0
BBC_AB3	06/05/19	09/23/19	0.2	18	15	25.2	22.4	0
BBC_AB3	06/05/19	09/23/19	1.3	19	16	25.6	22.2	0
BBC_AB4	05/28/15	09/22/15	0.2	22	19	26.3	23.0	0
BBC_AB4	05/28/15	09/22/15	1.5	18	15	26.3	22.9	0
BBC_AB4	05/31/16	09/24/16	0.2	26	22	28.0	23.6	0
BBC_AB4	05/31/16	09/24/16	1.3	22	18	26.1	23.1	0
BBC_AB4	05/31/17	09/05/17	0.2	20	19	26.9	22.8	0
BBC_AB4	05/31/17	09/05/17	1.4	16	15	24.5	22.0	0
BBC_AB4	06/01/18	09/20/18	0.2	18	17	27.6	23.9	0
BBC_AB4	06/01/18	09/20/18	0.9	15	14	27.2	23.6	0
BBC_AB4	06/27/19	09/18/19	0.4	12	11	26.0	24.0	0
BBC_AB4	07/02/19	09/18/19	1.1	6	5	25.5	24.2	0
BBC_AB6	07/13/15	08/25/15	0.2	4	4	25.0	23.8	0
BBC_AB6	07/05/16	08/15/16	0.2	3	3	25.0	23.3	0
BBC_AB6	07/06/17	08/17/17	0.2	3	3	24.9	23.9	0
BBC_AB6	07/10/18	08/07/18	0.2	3	3	24.6	23.7	0
BBC_AB6	07/11/19	08/15/19	0.2	4	4	24.0	23.6	0
BBC_AB6A	06/05/15	09/24/15	0.3	18	16	24.0	21.1	0
BBC_AB6A	06/05/15	09/24/15	1.6	17	15	24.0	20.6	0
BBC_AB6A	06/01/16	09/18/16	0.2	18	17	25.0	22.8	0
BBC_AB6A	06/01/16	09/24/16	1.4	20	18	25.0	22.6	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_AB6A	05/31/17	09/17/17	0.2	19	17	25.0	21.1	0
BBC_AB6A	05/31/17	09/17/17	1.5	19	17	24.0	20.8	0
BBC_AB6A	06/11/18	09/20/18	0.2	13	12	25.4	23.0	0
BBC_AB6A	06/11/18	09/20/18	1.6	13	12	25.4	22.9	0
BBC_AB7	06/04/15	09/23/15	0.3	17	15	23.0	20.7	0
BBC_AB7	06/04/15	09/23/15	2.4	15	13	23.0	19.8	0
BBC_AB7	06/07/16	09/21/16	0.2	14	12	25.0	22.2	0
BBC_AB7	06/07/16	09/21/16	2.4	13	11	25.0	21.6	0
BBC_AB7	06/17/17	09/16/17	0.2	14	13	23.0	21.1	0
BBC_AB7	06/17/17	09/16/17	2.4	14	13	22.6	20.6	0
BBC_AB7	05/29/18	09/15/18	0.2	13	12	25.9	23.0	0
BBC_AB7	05/29/18	09/15/18	2.4	13	12	25.5	22.8	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_AB2	2015	0.2	4	0.26	0.52	0.38	4	4.74	12.45	8.32	1	1
BBC_AB2	2016	0.2	2	0.40	0.84	0.62	4	5.01	12.96	7.15	1	1
BBC_AB2	2017	0.2	1	0.41	0.41	0.41	4	5.52	10.15	7.65	0	1
BBC_AB2	2018	0.2	3	0.34	0.46	0.40	3	3.75	6.67	5.61	1	0
BBC_AB2	2019	0.2	3	0.34	0.69	0.50	4	6.66	9.14	7.40	0	0
BBC_AB3	2015	0.2	3	0.31	0.49	0.38	4	5.09	9.57	8.21	0	0
BBC_AB3	2015	1.1	3	0.28	0.51	0.41	4	4.06	8.03	5.97	2	0
BBC_AB3	2016	0.2	2	0.46	1.12	0.79	4	4.18	13.20	6.89	2	1
BBC_AB3	2016	1.2	2	0.40	0.76	0.58	4	2.62	7.83	4.77	3	0
BBC_AB3	2017	0.2	1	0.38	0.38	0.38	4	3.44	13.93	7.23	2	1
BBC_AB3	2017	1.0	2	0.43	0.51	0.47	4	3.51	9.29	6.40	1	0
BBC_AB3	2018	0.2	2	0.35	0.43	0.39	3	3.93	6.09	4.75	2	0
BBC_AB3	2018	1.1	3	0.35	0.46	0.42	3	3.43	6.41	5.35	1	0
BBC_AB3	2019	0.2	3	0.34	0.68	0.47	4	3.65	6.25	5.43	1	0
BBC_AB4	2015	0.2	3	0.36	0.66	0.46	4	8.90	16.68	12.21	0	2
BBC_AB4	2016	0.2	1	0.75	0.75	0.75	4	4.31	20.66	9.54	2	1
BBC_AB4	2017	0.2	1	0.67	0.67	0.67	4	4.72	20.88	10.58	1	2
BBC_AB4	2018	0.2	2	0.43	0.61	0.52	3	3.53	8.64	5.61	2	0
BBC_AB4	2019	0.2	3	0.46	0.99	0.78	4	6.17	7.22	6.66	0	0
BBC_AB6	2015	0.2	3	0.30	0.51	0.39	4	4.70	15.73	9.24	1	2
BBC_AB6	2016	0.2	1	0.38	0.38	0.38	3	3.43	5.54	4.66	2	0

BBC_AB6	2017	0.2	1	0.35	0.35	0.35	3	4.88	6.90	6.09	1	0
BBC_AB6	2018	0.2	3	0.30	0.50	0.40	3	3.24	6.74	5.21	1	0
BBC_AB6	2019	0.2	3	0.35	0.71	0.55	4	0.94	6.31	4.56	1	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_AB1	07/17/16	08/31/16	2	1.2	1.3	1.2
BBC_AB1	06/21/17	09/20/17	4	1.0	1.5	1.3
BBC_AB1	06/11/18	09/11/18	3	0.9	1.6	1.3
BBC_AB1	06/14/19	09/14/19	4	1.0	1.5	1.3
BBC_AB2	06/17/15	09/19/15	16	1.3	2.2	1.7
BBC_AB2	06/01/16	09/25/16	19	0.6	2.1	1.5
BBC_AB2	07/06/17	08/17/17	4	1.4	1.8	1.6
BBC_AB2	06/15/18	09/11/18	17	1.0	2.1	1.5
BBC_AB2	06/05/19	08/28/19	13	1.6	2.2	1.8
BBC_AB3	06/17/15	09/21/15	9	1.1	1.6	1.3
BBC_AB3	06/16/16	09/18/16	13	1.0	1.9	1.4
BBC_AB3	06/07/17	09/06/17	6	1.4	2.1	1.6
BBC_AB3	06/11/18	08/27/18	4	1.2	1.7	1.4
BBC_AB3	06/14/19	08/17/19	6	1.5	1.8	1.7
BBC_AB4	05/28/15	09/22/15	18	0.9	1.7	1.3
BBC_AB4	05/31/16	09/07/16	16	0.6	2.1	1.3
BBC_AB4	06/17/17	09/05/17	11	0.9	2.4	1.5
BBC_AB4	06/16/18	08/31/18	7	1.0	1.5	1.1
BBC_AB4	07/02/19	08/15/19	7	1.2	1.8	1.5
BBC_AB6	07/27/15	08/25/15	3	1.4	1.9	1.7
BBC_AB6	07/05/16	08/15/16	3	1.1	1.6	1.4
BBC_AB6	07/06/17	08/17/17	3	1.6	1.9	1.7
BBC_AB6	07/10/18	08/07/18	3	1.4	1.7	1.6
BBC_AB6	07/11/19	08/15/19	3	1.7	2.1	1.9
BBC_AB6A	06/16/15	08/09/15	5	1.4	2.2	1.8
BBC_AB6A	07/15/16	07/15/16	1	1.7	1.7	1.7
BBC_AB6A	06/07/17	09/06/17	5	1.1	2.4	1.6
BBC_AB6A	06/11/18	09/20/18	7	0.7	2.3	1.7
BBC_AB7	06/04/15	09/23/15	16	1.5	2.7	2.0
BBC_AB7	06/07/16	09/21/16	14	1.6	3.5	2.2
BBC_AB7	06/17/17	09/16/17	14	1.1	2.6	1.9
BBC_AB7	05/29/18	09/15/18	13	1.6	2.5	2.0

Toxics and other pollutants (metals, ammonia, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

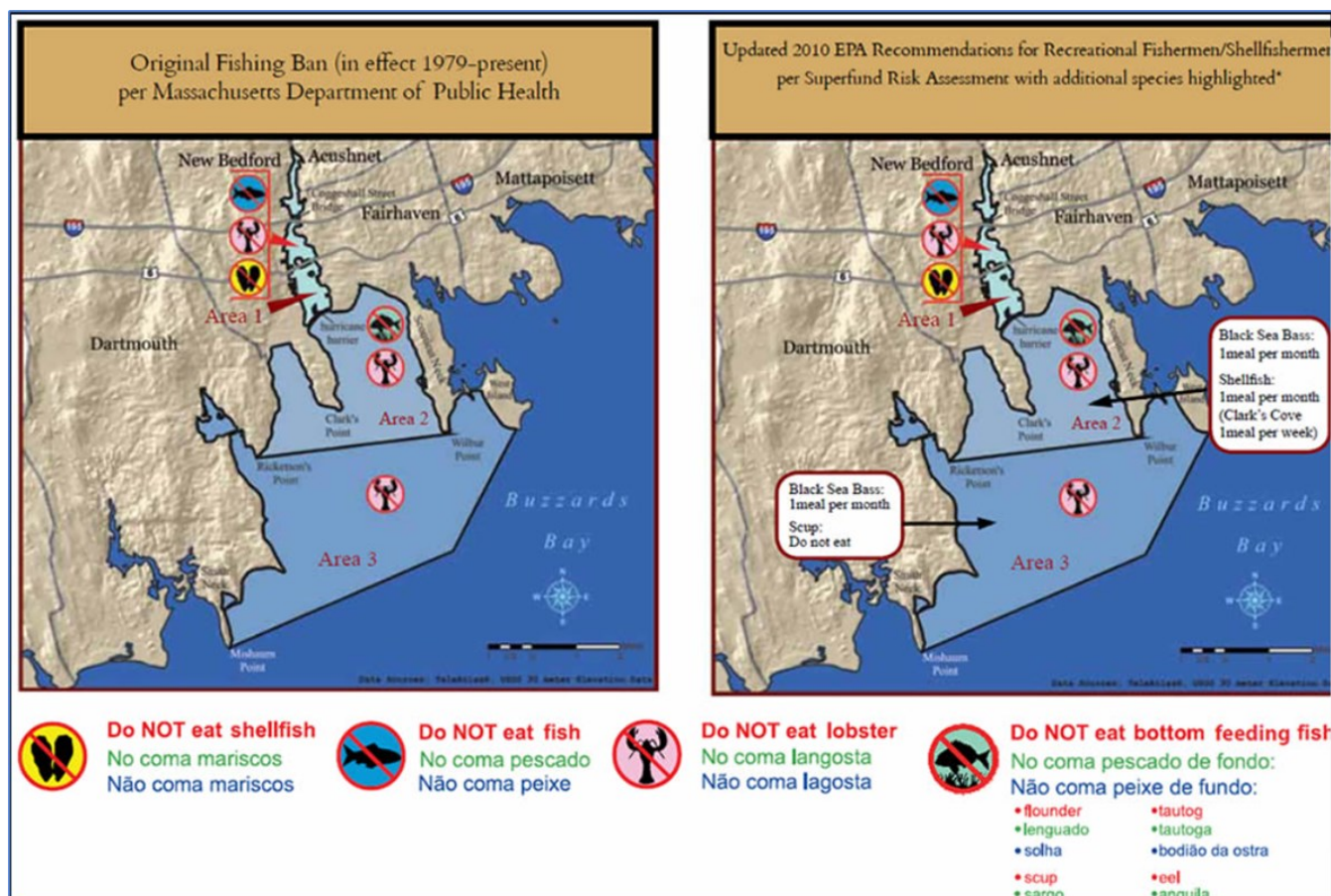
[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_AB2	07/13/15	08/25/15	0.2	4	0.012	0.065	0.036
BBC_AB2	07/05/16	08/15/16	0.2	4	0.008	0.055	0.025
BBC_AB2	07/06/17	08/17/17	0.2	4	0.004	0.009	0.007
BBC_AB2	07/10/18	08/07/18	0.2	3	0.006	0.020	0.011
BBC_AB2	07/11/19	08/15/19	0.2	4	0.004	0.129	0.046
BBC_AB3	07/13/15	08/25/15	0.2	4	0.011	0.071	0.035
BBC_AB3	07/13/15	08/25/15	1.1	4	0.013	0.084	0.036
BBC_AB3	07/05/16	08/15/16	0.2	4	0.005	0.158	0.052
BBC_AB3	07/05/16	08/15/16	1.2	4	0.007	0.138	0.049
BBC_AB3	07/06/17	08/17/17	0.2	4	0.004	0.023	0.010
BBC_AB3	07/06/17	08/17/17	1.0	4	0.004	0.009	0.007
BBC_AB3	07/10/18	08/07/18	0.2	3	0.004	0.009	0.006
BBC_AB3	07/10/18	08/07/18	1.1	3	0.005	0.012	0.009
BBC_AB3	07/11/19	08/15/19	0.2	4	0.004	0.080	0.030
BBC_AB4	07/13/15	08/25/15	0.2	4	0.008	0.028	0.015
BBC_AB4	07/05/16	08/15/16	0.2	4	0.005	0.013	0.009
BBC_AB4	07/06/17	08/17/17	0.2	4	0.004	0.007	0.005
BBC_AB4	07/10/18	08/07/18	0.2	3	0.005	0.009	0.007
BBC_AB4	07/11/19	08/15/19	0.2	4	0.004	0.260	0.070
BBC_AB6	07/13/15	08/25/15	0.2	4	0.010	0.062	0.037
BBC_AB6	07/05/16	08/01/16	0.2	2	0.015	0.022	0.018
BBC_AB6	07/06/17	08/17/17	0.2	3	0.004	0.011	0.007
BBC_AB6	07/10/18	08/07/18	0.2	3	0.005	0.019	0.012
BBC_AB6	07/11/19	08/15/19	0.2	4	0.004	0.086	0.035

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
The Fish Consumption Use for Apponagansett Bay (MA95-39) will continue to be assessed as Not Supporting with the PCBs in Fish Tissue impairment being carried forward. EPA and MA DPH recommend that in Area III (which encompasses this Apponagansett Bay AU) (EPA 2022)—The general public should not eat lobster or scup from this area and black sea bass should be limited to one meal per month.	

<https://www.epa.gov/new-bedford-harbor/fish-consumption-regulations-and-recommendations> (EPA 2022)



Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>Apponagansett Bay (MA95-39): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.0222 sq mi (96%). The approved shellfish growing area represents 0.1795 sq mi (17%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.</p>	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB11.0	Dartmouth East Coastal, Approved	Approved	0.13500	12.7%
BB12.0	Apponagansett Bay	Approved	0.04448	4.2%
BB12.1	Apponagansett Bay: Eastern Closed Area	Prohibited	0.07948	7.5%
BB12.2	Apponagansett Bay: Town Landing	Prohibited	0.00095	0.1%
BB12.3	Apponagansett Bay	Conditionally Approved	0.45022	42.4%

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB12.4	Apponagansett River North Closed Area	Prohibited	0.09712	9.1%
BB12.5	Apponagansett Bay Deepwater Mooring Area	Conditionally Approved	0.21495	20.2%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Apponagansett Bay (MA95-39) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
Two Dartmouth beaches, Apponagansett Town Beach (ID 2731) and Bayview (ID 2732) were almost never posted for swimming between 2014 and 2019. The Primary Contact Recreational Use for Apponagansett Bay (MA95-39) is assessed as Fully Supporting since there were few, if any, swimming advisory postings at either the Apponagansett Town or Bayview beaches between 2014 and 2019.	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2731	Apponagansett Town Beach/Dartmouth	41.58344	-70.95640	41.58427	-70.95290	0%	7%	0%	0%	0%	2%	0
2732	Bayview/Dartmouth	41.57184	-70.94560	41.57141	-70.94520	0%	2%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Apponagansett Bay (MA95-39): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.0222 sq mi (96%). The approved shellfish growing area represents 0.1795 sq mi (17%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment		Alert
Fully Supporting		NO
2022 Use Attainment Summary		
<p>Two Dartmouth beaches, Apponagansett Town Beach (ID 2731) and Bayview (ID 2732) were almost never posted for swimming between 2014 and 2019.</p> <p>The Secondary Contact Recreational Use for Apponagnasett Bay (MA95-39) is assessed as Fully Supporting since there were few, if any, swimming advisory postings at either the Apponagansett Town or Bayview beaches between 2014 and 2019.</p>		

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
<p>Apponagansett Bay (MA95-39): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.0222 sq mi (96%). The approved shellfish growing area represents 0.1795 sq mi (17%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.</p>

Aucoot Cove (MA95-09)

Location:	From the boundary of Division of Marine Fisheries designated shellfishing growing area BB31.1, north and southwest from Haskell Island, Marion to the mouth at Buzzards Bay demarcated by a line drawn between Converse Point, Marion and Joes Point, Mattapoisett (prior to 2008 this segment included the restricted shellfishing portion of cove and the estuarine portion of Aucoot Creek).
AU Type:	ESTUARY
AU Size:	0.46 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	5	Estuarine Bioassessments		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					

Recommendations

2022 Recommendations
ALU: Conduct additional monitoring for nutrient enrichment indicators on summer ebb tides for the Aucoot Cove AU (MA95-09). Be sure to get at least three samples per year for total nitrogen so seasonal averages can be calculated as per CALM requirements.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an ~15% loss of eelgrass bed habitat in this Aucoot Cove AU (MA95-09) between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at four locations in this Aucoot Cove, Marion/Mattapoisett AU (MA95-09) in the summers of 2015-2019, as follows: from a dock roughly halfway down the AU (on the east bank) (BBC_AC5A) and also further offshore (from inner to outer) BBC_AC3, AC4, and AC5. Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at BBC_AC5A (at depths ranging 2.1-2.5m) and AC4 (at depths ranging 3.0-3.6m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 30.0°C (n=272), just once (in 2018) measuring >29.4°C at BBC_AC3 at the surface; the minimum dissolved oxygen (DO) was 4.3mg/L (n=263), measuring <6.0mg/L 26 times (9.8% of the measurements overall) and <5.0mg/L four times (1.5% of the measurements overall). Excursions from the 6.0mg/L DO criterion occurred intermittently throughout the cove at all sample stations at the surface and at depth. Nutrient sampling efforts (ebb tides in July and August at BBC_AC3 and AC5) documented a maximum total nitrogen concentration of 0.4mg/L (n=6) (not enough data for any one year to calculate seasonal averages) and chlorophyll *a* concentrations were always <10µg/L (and only twice were >5µg/L), with a maximum of 7.7µg/L (n=32). The BBC measured Secchi disk depth in Aucoot Cove in the summers of 2015-2019, usually weekly at BBC_AC4 and a little more intermittently at the other stations reporting depths ranging from 0.5 to 3.5m (n=138). Ammonia-nitrogen concentrations were low (range 0.004 to 0.14mg/L (n=32)), but TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for this Aucoot Cove AU (MA95-09) is assessed as Not Supporting based on the loss of eelgrass bed habitat documented by the MassDEP Eelgrass Mapping Project between 1995 and 2017. An impairment for Estuarine Bioassessments is being added.

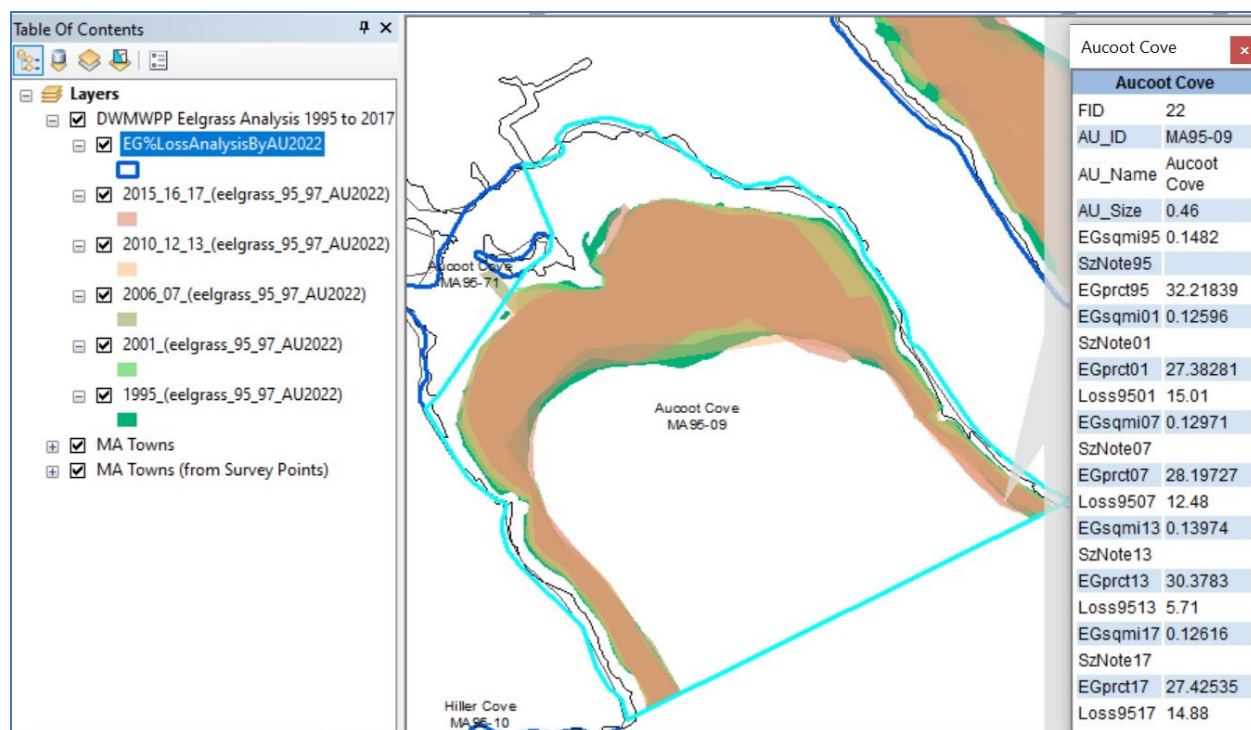
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_AC3	Buzzards Bay Coalition	Water Quality	Aucoot Cove	Aucoot Cove Mid, Marion	41.678275	-70.756252
BBC_AC4	Buzzards Bay Coalition	Water Quality	Aucoot Cove	Aucoot Cove Outer, Marion	41.674931	-70.756969
BBC_AC5	Buzzards Bay Coalition	Water Quality	Aucoot Cove	Aucoot Cove Outer, Marion/Mattapoisett	41.671781	-70.756647
BBC_AC5A	Buzzards Bay Coalition	Water Quality	Aucoot Cove	Aucoot Cove Outer, Marion	41.674143	-70.749146

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Aucoot Cove MA95-09 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~15% loss of eelgrass bed habitat in Aucoot Cove between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_AC3	08/15/16	08/15/16	0.2	1	4.9	4.9	100	100	0
BBC_AC4	06/03/15	09/23/15	0.2	18	6.1	7.1	0	0	0
BBC_AC4	06/03/15	09/23/15	3.6	18	4.3	6.6	17	6	0
BBC_AC4	06/05/16	09/23/16	0.2	15	5.1	6.8	13	0	0
BBC_AC4	06/05/16	09/23/16	3.6	15	5.3	6.6	13	0	0
BBC_AC4	06/07/17	09/17/17	0.2	18	6.4	7.2	0	0	0
BBC_AC4	06/07/17	09/17/17	3.4	18	6.0	6.9	0	0	0
BBC_AC4	05/31/18	09/19/18	0.2	19	5.4	6.9	16	0	0
BBC_AC4	05/31/18	09/19/18	3.6	19	4.9	6.5	21	5	0
BBC_AC4	06/26/19	09/15/19	0.4	7	6.8	7.0	0	0	0
BBC_AC4	06/26/19	09/15/19	3.0	7	5.8	6.6	29	0	0
BBC_AC5	08/15/16	08/15/16	0.2	1	6.6	6.6	0	0	0
BBC_AC5A	06/05/15	09/20/15	0.2	12	7.0	7.8	0	0	0
BBC_AC5A	06/16/15	09/20/15	2.5	8	7.0	7.8	0	0	0
BBC_AC5A	06/17/16	09/25/16	0.2	12	5.5	6.7	8	0	0
BBC_AC5A	06/11/16	09/20/16	2.1	13	6.0	6.9	0	0	0
BBC_AC5A	06/11/17	09/17/17	0.4	9	5.5	6.3	33	0	0
BBC_AC5A	06/16/17	09/17/17	2.3	8	6.0	6.6	0	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_AC5A	05/30/19	09/24/19	0.2	22	5.0	6.7	9	0	0
BBC_AC5A	05/30/19	09/24/19	2.1	23	4.5	7.2	9	4	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_AC3	07/13/15	08/25/15	0.2	3	3	26.0	24.3	0
BBC_AC3	08/15/16	08/15/16	0.2	1	1	26.3	26.3	0
BBC_AC3	07/06/17	08/17/17	0.2	4	4	23.9	23.1	0
BBC_AC3	07/10/18	08/21/18	0.2	4	4	30.0	25.5	1
BBC_AC3	07/11/19	08/15/19	0.2	4	4	23.0	22.1	0
BBC_AC4	06/03/15	09/23/15	0.2	18	16	26.1	23.1	0
BBC_AC4	06/03/15	09/23/15	3.6	18	16	25.6	22.7	0
BBC_AC4	06/05/16	09/23/16	0.2	19	16	26.3	23.0	0
BBC_AC4	06/05/16	09/23/16	3.5	19	16	26.2	22.8	0
BBC_AC4	06/07/17	09/17/17	0.2	18	17	24.8	21.5	0
BBC_AC4	06/07/17	09/17/17	3.4	18	17	24.3	21.3	0
BBC_AC4	05/31/18	09/19/18	0.2	19	16	26.4	22.6	0
BBC_AC4	05/31/18	09/19/18	3.6	19	16	26.4	22.2	0
BBC_AC4	06/26/19	09/15/19	0.4	7	7	24.8	22.6	0
BBC_AC4	06/26/19	09/15/19	3.0	7	7	24.8	22.4	0
BBC_AC5	07/13/15	08/25/15	0.2	3	3	26.0	24.5	0
BBC_AC5	08/15/16	08/15/16	0.2	1	1	26.2	26.2	0
BBC_AC5	07/06/17	08/17/17	0.2	4	4	26.0	24.1	0
BBC_AC5	07/10/18	08/21/18	0.2	4	4	28.0	25.8	0
BBC_AC5	07/11/19	08/15/19	0.2	4	4	22.0	21.6	0
BBC_AC5A	06/05/15	09/20/15	0.2	12	11	25.0	21.0	0
BBC_AC5A	06/16/15	09/20/15	2.5	8	7	25.0	22.0	0
BBC_AC5A	06/17/16	09/25/16	0.2	13	11	26.0	23.1	0
BBC_AC5A	06/11/16	09/25/16	2.1	14	12	26.0	22.9	0
BBC_AC5A	06/11/17	09/17/17	0.4	9	8	24.0	21.3	0
BBC_AC5A	06/16/17	09/17/17	2.3	8	7	24.0	21.8	0
BBC_AC5A	05/30/19	09/24/19	0.2	23	20	26.0	22.0	0
BBC_AC5A	05/30/19	09/24/19	2.1	23	20	26.0	22.0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)
Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_AC3	2015	0.2	1	0.27	0.27	0.27	3	1.66	2.76	2.33	3	0
BBC_AC3	2016	0.2	--	--	--	--	1	2.11	2.11	2.11	1	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_AC3	2017	0.2	2	0.37	0.40	0.38	4	2.24	2.95	2.58	4	0
BBC_AC3	2018	0.2	--	--	--	--	4	1.61	4.75	2.93	4	0
BBC_AC3	2019	0.2	1	0.40	0.40	0.40	4	2.39	7.70	4.79	2	0
BBC_AC5	2015	0.2	1	0.21	0.21	0.21	3	1.05	3.45	2.51	3	0
BBC_AC5	2016	0.2	--	--	--	--	1	2.85	2.85	2.85	1	0
BBC_AC5	2017	0.2	1	0.36	0.36	0.36	4	1.83	3.36	2.44	4	0
BBC_AC5	2018	0.2	--	--	--	--	4	2.44	4.40	3.36	4	0
BBC_AC5	2019	0.2	--	--	--	--	4	1.08	5.00	3.37	4	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_AC3	08/15/16	08/15/16	1	2.4	2.4	2.4
BBC_AC3	07/20/17	08/03/17	2	1.2	1.9	1.6
BBC_AC3	07/24/18	07/24/18	1	1.0	1.0	1.0
BBC_AC3	08/08/19	08/15/19	2	0.5	1.1	0.8
BBC_AC4	06/03/15	09/23/15	17	1.6	3.5	2.4
BBC_AC4	06/05/16	09/23/16	19	1.4	3.3	2.4
BBC_AC4	06/07/17	09/17/17	18	1.1	3.4	2.2
BBC_AC4	05/31/18	09/19/18	19	1.6	2.6	2.1
BBC_AC4	06/26/19	09/15/19	6	1.8	2.9	2.3
BBC_AC5	07/13/15	08/25/15	3	2.0	2.7	2.4
BBC_AC5	08/15/16	08/15/16	1	2.5	2.5	2.5
BBC_AC5	07/06/17	08/17/17	4	2.0	2.6	2.3
BBC_AC5	07/10/18	08/21/18	4	1.3	2.4	2.0
BBC_AC5	07/11/19	08/15/19	4	1.3	2.2	1.8
BBC_AC5A	06/05/15	09/14/15	8	1.4	2.7	2.2
BBC_AC5A	06/11/16	08/26/16	8	1.8	2.5	2.1
BBC_AC5A	06/11/17	08/22/17	6	1.3	2.9	2.1
BBC_AC5A	05/30/19	09/24/19	15	1.3	2.5	1.9

Toxics and other pollutants (metals, ammonia, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_AC3	07/13/15	08/25/15	0.2	3	0.009	0.014	0.012
BBC_AC3	08/15/16	08/15/16	0.2	1	0.004	0.004	0.004
BBC_AC3	07/06/17	08/17/17	0.2	4	0.004	0.008	0.006
BBC_AC3	07/10/18	08/21/18	0.2	4	0.004	0.004	0.004

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_AC3	07/11/19	08/15/19	0.2	4	0.004	0.012	0.006
BBC_AC5	07/13/15	08/25/15	0.2	3	0.006	0.009	0.008
BBC_AC5	08/15/16	08/15/16	0.2	1	0.007	0.007	0.007
BBC_AC5	07/06/17	08/17/17	0.2	4	0.004	0.005	0.004
BBC_AC5	07/10/18	08/21/18	0.2	4	0.004	0.004	0.004
BBC_AC5	07/11/19	08/15/19	0.2	4	0.004	0.004	0.004

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Aucoot Cove AU (MA95-09); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
Aucoot Cove (MA95-09): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.4406 sq mi (97%). The approved shellfish growing area represents 0.4406 sq mi (97%). The Shellfish Harvesting Use is assessed as fully supporting because the growing area (normalized to the AU area) is classified as 100% approved.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB31.0	Aucoot Cove	Approved	0.44057	96.6%
BB31.1	Aucoot Cove	Prohibited	0.00000	0.0%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Aucoot Cove AU (MA95-09) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	

There are two beaches in Aucoot Cove (MA95-09), both in the town of Mattapoisett; the names and ID codes for the beaches are as follows: Harbor Beach 2 (South) (ID 2965) and Harbor Beach 1 (North) (ID 2967). These beaches were never posted for swimming between 2014 and 2019. In addition, the total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.4406 sq mi (97%) and the approved shellfish growing area represents 0.4406 sq mi (97%).

The Primary Contact Recreational Use for this Aucoot Cove AU (MA95-09) is assessed as Fully Supporting since there were no swimming advisory postings at Harbor Beach 2 (South) or Harbor Beach 1 (North) between 2014 and 2019 and because the shellfish growing area (normalized to the AU area) is classified as 100% approved.

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2965	Harbor Beach 2 (South)/Mattapoisett	41.66852	-70.75810	41.66827	-70.75790	0%	0%	0%	0%	0%	0%	0
2967	Harbor Beach 1 (North)/Mattapoisett	41.67024	-70.75970	41.67018	-70.75960	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Aucoot Cove (MA95-09): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.4406 sq mi (97%). The approved shellfish growing area represents 0.4406 sq mi (97%). The Primary Contact Recreational Use is assessed as fully supporting because the growing area (normalized to the AU area) is classified as 100% approved, unless other data are available that contradict this use attainment decision.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There are two beaches in Aucoot Cove (MA95-09), both in the town of Mattapoisett; the names and ID codes for the beaches are as follows: Harbor Beach 2 (South) (ID 2965) and Harbor Beach 1 (North) (ID 2967). These beaches were never posted for swimming between 2014 and 2019. In addition, the total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.4406 sq mi (97%) and the approved shellfish growing area represents 0.4406 sq mi (97%).</p> <p>The Secondary Contact Recreational Use for this Aucoot Cove AU (MA95-09) is assessed as Fully Supporting since there were no swimming advisory postings at Harbor Beach 2 (South) or Harbor Beach 1 (North) between 2014 and 2019 and because the shellfish growing area (normalized to the AU area) is classified as 100% approved.</p>	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary

Aucoot Cove (MA95-09): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.4406 sq mi (97%). The approved shellfish growing area represents 0.4406 sq mi (97%). The Secondary Contact Recreational use is assessed as fully supporting because the growing area (normalized to the AU area) is classified as 100% approved, unless other data are available that contradict this use attainment decision.

Aucoot Cove (MA95-71)

Location:	From the confluence with Aucoot Creek, Marion to the boundary of Division of Marine Fisheries designated shellfishing growing area BB31.1, north and southwest from Haskell Island, Marion (formerly part of 2006 segment: Aucoot Cove MA95-09).
AU Type:	ESTUARY
AU Size:	0.03 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Dissolved Oxygen		Unchanged
5	5	Fecal Coliform	36172	Unchanged
5	5	Nitrogen, Total		Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Source Unknown (N)	X					
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)	X					

Recommendations

2022 Recommendations
ALU: Conduct additional monitoring for nutrient enrichment indicators on summer ebb tides for this Aucoot Cove AU (MA95-71). Be sure to get at least three samples per year for total nitrogen so seasonal averages can be calculated as per CALM requirements.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented no change in the documented lack of eelgrass bed habitat between 1995 and 2017. It should be noted that an area of eelgrass bed habitat (of the size 0.0009 sq miles) was documented in 2007, but by 2013 this bed was almost completely gone. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in Aucoot Cove, Mattapoisett/Marion (MA95-71) in the summers of 2015-2019, from the inner to outer area these sites are as follows: BBC_AC1, AC1A, and AC2. Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at BBC_AC1 and AC1A (at depths ranging 0.5-0.8m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 30°C (n=156) exceeding 29.4°C just once at BBC_AC2. Most dissolved oxygen (DO) data were collected at BBC_AC1 and AC1A with a minimum of 1.0mg/L (n=138); overall measuring <6.0mg/L 101 times (73% of the measurements) and <5.0mg/L 71 times (51% of the measurements). Excursions from the DO criterion (6.0mg/L) occurred most frequently (and were often severe i.e., <5.0mg/L) at BBC_AC1, which was located close to shore in a narrow finger of water at the southern end of the AU, just off the end of Indian Cove Road, at the surface and at depths of 0.7-0.9m. Nutrient sampling efforts (ebb tides in July and August at BBC_AC1 and AC2) documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.32-0.63mg/L; >0.4mg/L for 7 of the 8 calculated averages (n=31). The maximum chlorophyll *a* concentration was 10.1µg/L (n=35). The BBC did Secchi disk depth readings in Aucoot Cove once or twice a year which averaged 0.8 to 1.1m (n=7) and ammonia-nitrogen concentrations ranged from 0.004 to 0.096mg/L (n=35), though TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for Aucoot Cove (MA95-71) will continue to be assessed as Not Supporting, based on the water quality data collected by the BBC staff/volunteers in 2015-2019, which continued to be indicative of poor conditions; so the Dissolved Oxygen, Total Nitrogen, and Nutrient/Eutrophication Biological Indicators impairments are being carried forward.

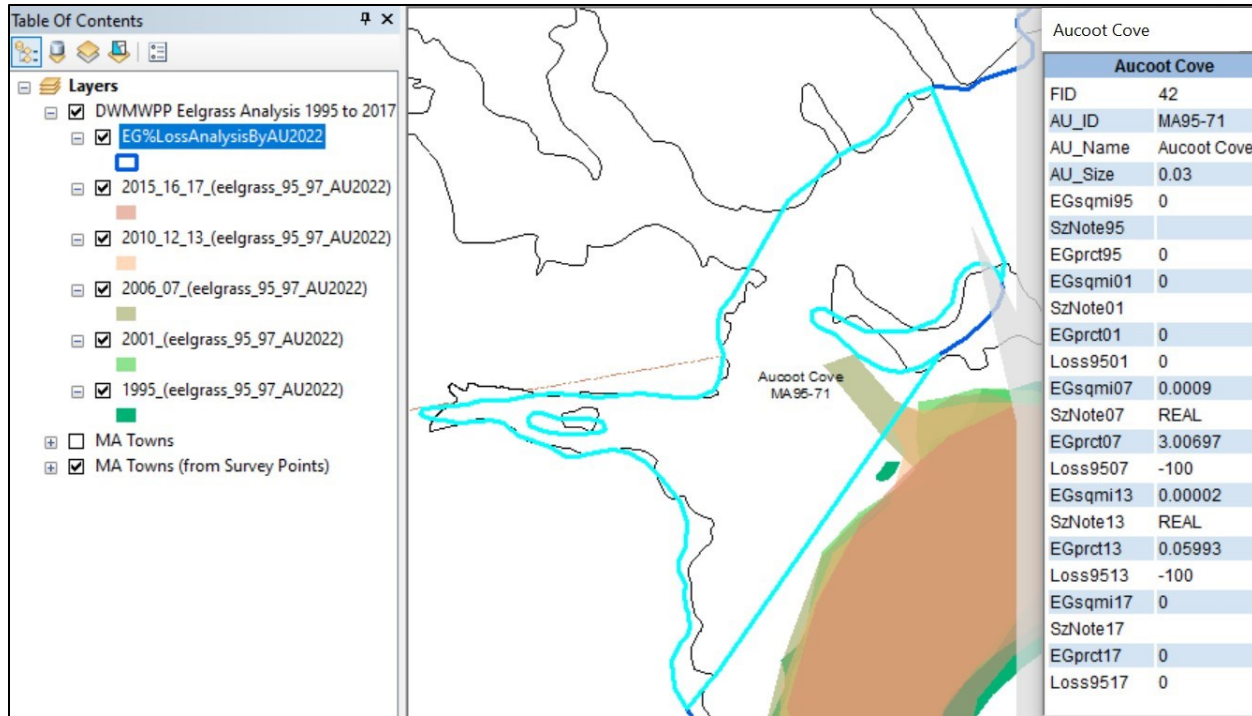
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_AC1	Buzzards Bay Coalition	Water Quality	Aucoot Cove	Aucoot Cove Inner, Mattapoisett	41.6769	-70.765604
BBC_AC1A	Buzzards Bay Coalition	Water Quality	Aucoot Cove	Aucoot Cove Inner, Mattapoisett	41.677179	-70.762941
BBC_AC2	Buzzards Bay Coalition	Water Quality	Aucoot Cove	Aucoot Cove Inner, Marion	41.678153	-70.76225

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Aucoot Cove MA95-71 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented no change in the documented lack of eelgrass bed habitat between 1995 and 2017. It should be noted that an area of eelgrass bed habitat (of the size 0.0009 sq miles) was documented in 2007, but by 2013 this bed was almost completely gone.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_AC1	06/04/15	09/23/15	0.2	18	2.5	4.9	72	44	28
BBC_AC1	07/05/16	09/19/16	0.2	10	2.5	4.5	100	60	30
BBC_AC1	06/17/16	09/19/16	0.7	7	3.4	4.3	100	86	43
BBC_AC1	06/07/17	09/20/17	0.1	20	1.0	3.0	100	85	70
BBC_AC1	09/06/17	09/20/17	0.9	4	4.3	4.8	100	75	0
BBC_AC1	06/05/18	09/19/18	0.1	18	1.5	2.9	100	83	72
BBC_AC1	05/30/19	09/19/19	0.2	19	2.0	4.4	74	53	37
BBC_AC1	08/14/19	09/13/19	0.7	3	4.3	4.9	100	33	0
BBC_AC1A	06/28/16	09/19/16	0.1	6	5.3	5.9	50	0	0
BBC_AC1A	07/12/16	09/14/16	0.7	3	4.3	5.4	67	33	0
BBC_AC1A	06/28/17	09/11/17	0.2	8	4.8	6.2	13	13	0
BBC_AC1A	06/28/17	09/11/17	0.7	8	4.7	6.2	25	13	0
BBC_AC1A	06/11/18	06/20/18	0.2	2	6.3	6.6	0	0	0
BBC_AC1A	06/11/18	06/11/18	0.5	1	6.9	6.9	0	0	0
BBC_AC1A	06/27/19	09/19/19	0.1	7	4.6	6.5	14	14	0
BBC_AC1A	08/14/19	09/13/19	0.8	3	5.9	6.8	33	0	0
BBC_AC2	08/15/16	08/15/16	0.2	1	5.1	5.1	100	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_AC1	06/04/15	09/23/15	0.2	21	19	26.0	22.2	0
BBC_AC1	07/05/16	09/19/16	0.2	10	9	27.6	23.4	0
BBC_AC1	06/17/16	09/19/16	0.7	7	6	23.5	21.8	0
BBC_AC1	06/07/17	09/20/17	0.1	24	22	25.0	21.3	0
BBC_AC1	09/06/17	09/20/17	0.8	4	3	20.9	20.2	0
BBC_AC1	06/05/18	09/19/18	0.1	22	21	28.0	22.8	0
BBC_AC1	05/30/19	09/19/19	0.2	23	21	23.0	21.2	0
BBC_AC1	08/14/19	09/13/19	0.7	3	3	23.3	20.6	0
BBC_AC1A	06/28/16	09/19/16	0.1	6	5	25.9	23.2	0
BBC_AC1A	07/12/16	09/14/16	0.7	3	3	22.4	22.0	0
BBC_AC1A	06/28/17	09/11/17	0.2	8	8	23.2	21.3	0
BBC_AC1A	06/28/17	09/11/17	0.7	8	8	23.3	21.4	0
BBC_AC1A	06/11/18	06/20/18	0.2	2	2	20.0	18.9	0
BBC_AC1A	06/11/18	06/11/18	0.5	1	1	17.8	17.8	0
BBC_AC1A	06/27/19	09/19/19	0.1	7	6	24.2	22.1	0
BBC_AC1A	08/14/19	09/13/19	0.8	3	3	23.4	21.2	0
BBC_AC2	07/13/15	08/25/15	0.2	3	3	26.0	24.2	0
BBC_AC2	08/15/16	08/15/16	0.2	1	1	26.4	26.4	0
BBC_AC2	07/06/17	08/17/17	0.2	4	4	26.0	24.0	0
BBC_AC2	07/10/18	08/21/18	0.2	4	4	30.0	25.3	1
BBC_AC2	07/11/19	08/15/19	0.2	4	4	22.5	22.1	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)**Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_AC1	2015	0.2	3	0.29	0.57	0.43	3	3.31	5.43	4.12	2	0
BBC_AC1	2016	0.2	4	0.46	0.79	0.63	4	3.25	7.78	4.55	3	0
BBC_AC1	2017	0.2	4	0.36	0.58	0.51	4	2.89	4.25	3.45	4	0
BBC_AC1	2018	0.2	4	0.34	0.53	0.47	4	1.51	7.36	3.70	3	0
BBC_AC1	2019	0.2	2	0.47	0.53	0.50	4	3.85	10.10	6.98	2	1
BBC_AC2	2015	0.2	3	0.25	0.41	0.32	3	2.30	4.78	3.24	3	0
BBC_AC2	2016	0.2	--	--	--	--	1	1.86	1.86	1.86	1	0
BBC_AC2	2017	0.2	4	0.34	0.65	0.49	4	2.50	2.89	2.72	4	0
BBC_AC2	2018	0.2	4	0.33	0.48	0.42	4	1.48	3.29	2.61	4	0
BBC_AC2	2019	0.2	3	0.37	0.54	0.47	4	1.63	5.58	3.72	2	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_AC1	06/16/15	06/16/15	1	0.8	0.8	0.8
BBC_AC1	07/05/16	08/01/16	2	0.6	1.0	0.8
BBC_AC1	09/06/17	09/06/17	1	0.9	0.9	0.9
BBC_AC1	08/11/18	08/11/18	1	1.1	1.1	1.1
BBC_AC2	08/17/17	08/17/17	1	0.8	0.8	0.8
BBC_AC2	08/15/19	08/15/19	1	1.0	1.0	1.0

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_AC1	07/13/15	08/25/15	0.2	3	0.019	0.041	0.032
BBC_AC1	07/05/16	08/15/16	0.2	4	0.014	0.067	0.046
BBC_AC1	07/06/17	08/17/17	0.2	4	0.032	0.096	0.057
BBC_AC1	07/10/18	08/21/18	0.2	4	0.015	0.065	0.035
BBC_AC1	07/11/19	08/15/19	0.2	4	0.004	0.088	0.037
BBC_AC2	07/13/15	08/25/15	0.2	3	0.012	0.027	0.017
BBC_AC2	08/15/16	08/15/16	0.2	1	0.008	0.008	0.008
BBC_AC2	07/06/17	08/17/17	0.2	4	0.018	0.029	0.022
BBC_AC2	07/10/18	08/21/18	0.2	4	0.007	0.042	0.020
BBC_AC2	07/11/19	08/15/19	0.2	4	0.004	0.061	0.027

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Aucoot Cove AU (MA95-71); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Aucoot Cove (MA95-71): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0303 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0303 sq mi (91%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB31.0	Aucoot Cove	Approved	0.00001	0.0%
BB31.1	Aucoot Cove	Prohibited	0.03028	90.6%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Aucoot Cove AU (MA95-71) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for this Aucoot Cove AU (MA95-71) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Aucoot Cove (MA95-71): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0303 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for this Aucoot Cove AU (MA95-71) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Aucoot Cove (MA95-71): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0303 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Aucoot Creek (MA95-72)

Location:	Estuarine portion east of Holly Pond Road, Marion to confluence with Aucoot Cove, Marion (formerly part of 2006 segment: Aucoot Cove MA95-09).
AU Type:	ESTUARY
AU Size:	0.02 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Dissolved Oxygen		Unchanged
5	5	Fecal Coliform	36172	Unchanged
5	5	Nitrogen, Total		Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Source Unknown (N)	X					
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)	X					

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No data are available to assess the Aquatic Life Use for Aucoot Creek (MA95-72), so it will continue to be assessed as Not Supporting with the impairments for Dissolved Oxygen, Total Nitrogen and Nutrient/Eutrophication Biological Indicators being carried forward.	

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Aucoot Creek (MA95-72); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Aucoot Creek (MA95-72): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0118 sq mi (74%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0118 sq mi (74%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB31.1	Aucoot Cove	Prohibited	0.01182	73.7%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Aucoot Creek (MA95-72) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Aucoot Creek (MA95-72) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Aucoot Creek (MA95-72): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0118 sq mi (74%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Aucoot Creek (MA95-72) so it is Not Assessed.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Aucoot Creek (MA95-72): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0118 sq mi (74%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Back River (MA95-47)

Location:	Estuarine portion, west of County Road, Bourne to confluence with Phinneys Harbor (excluding Eel Pond), Bourne.
AU Type:	ESTUARY
AU Size:	0.09 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			

Recommendations

2022 Recommendations
ALU: Continue to conduct total nitrogen sampling (at least three times per season at mid-ebb tide) to evaluate nutrient related stress in the Back River (MA95-47) and its contribution to Phinneys Harbor (MA95-15 which is impaired for Total Nitrogen).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in Back River, Bourne (MA95-47) in the summers of 2015-2019, all in the downstream half of the AU in the vicinity of Shore Rd: just offshore upstream of Shore Rd (BBC_EP3), mid-channel just downstream of the Shore Rd bridge (BBC_BR2), and from a dock between the Shore Rd bridge and Railroad bridge (BBC_BR1). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at BBC_BR1 and BR2 (i.e., at average depths ranging from 1.2 to 1.9m) and was usually conducted weekly (between the hours of 6 and 9am), though data at BBC_BR2 was limited to 2015. The maximum temperature was 27.8°C (n=173). The minimum dissolved oxygen (DO) (most data at BBC_BR1) was 3.6mg/L (n=180), <6.0mg/L 63 times (35% of all measurements) and <5.0mg/L 19 times (~11% of all measurements) with lowest measurements at BBC_BR2 in 2015. Total nitrogen sampling (0.29 to 0.71mg/L, n=8) during ebb tides in July and/or August at BBC_EP3 documented a seasonal average total nitrogen concentration for sites/year with n>2 samples of 0.37mg/L in 2015. The maximum chlorophyll *a* was 10.45µg/L (n=18); >5µg/L four times and >10µg/L twice. Secchi disk depths ranged from 1.9 to 2.1m (n=3) and ammonia-nitrogen concentrations ranged from 0.004 to 0.02mg/L (n=18), though TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for the Back River (MA95-47) is assessed as Fully Supporting based on the generally good water quality conditions (consistent with those of a salt marsh tidal creek) documented by BBC staff/volunteers in 2015-2019. It is noted, however, that this AU does have a Protective TMDL for Total Nitrogen as part of the Phinneys Harbor Embayment System Total Maximum Daily Loads for Total Nitrogen report CN#247.0.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_BR1	Buzzards Bay Coalition	Water Quality	Back River	Back River, Bourne	41.728311	-70.614219
BBC_BR2	Buzzards Bay Coalition	Water Quality	Back River	Back River, Bourne	41.728493	-70.613603
BBC_EP3	Buzzards Bay Coalition	Water Quality	Back River	Back River, Bourne	41.728957	-70.61327

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_BR1	09/03/15	09/23/15	1.2	5	4.0	6.6	20	20	0
BBC_BR1	06/01/16	09/24/16	0.2	20	4.0	5.8	50	20	0
BBC_BR1	06/01/16	09/24/16	1.4	20	4.0	6.0	55	5	0
BBC_BR1	05/31/17	09/16/17	0.2	18	4.0	6.1	22	11	0
BBC_BR1	05/31/17	09/21/17	1.4	22	4.5	6.2	23	9	0
BBC_BR1	05/30/18	09/19/18	0.2	20	4.5	6.1	35	5	0
BBC_BR1	05/30/18	09/19/18	1.4	21	4.5	6.1	38	10	0
BBC_BR1	06/14/19	09/23/19	0.2	15	4.5	6.2	20	7	0
BBC_BR1	05/30/19	09/23/19	1.3	22	4.0	6.7	18	5	0
BBC_BR2	06/10/15	08/27/15	0.1	12	3.9	5.7	50	17	8
BBC_BR2	06/19/15	08/20/15	1.9	5	3.6	5.1	80	40	20

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_BR1	09/03/15	09/23/15	1.2	5	3	24.0	23.7	0
BBC_BR1	06/01/16	09/24/16	0.2	20	17	26.0	21.7	0
BBC_BR1	06/01/16	09/24/16	1.4	20	17	26.0	21.7	0
BBC_BR1	05/31/17	09/16/17	0.2	18	16	25.3	21.6	0
BBC_BR1	05/31/17	09/21/17	1.3	22	19	25.2	21.3	0
BBC_BR1	05/30/18	09/19/18	0.2	20	17	26.6	22.8	0
BBC_BR1	05/30/18	09/19/18	1.4	21	18	26.4	22.4	0
BBC_BR1	06/14/19	09/23/19	0.2	15	13	24.4	22.0	0
BBC_BR1	05/30/19	09/23/19	1.4	22	18	24.5	21.1	0
BBC_BR2	06/10/15	08/27/15	0.1	12	12	26.5	23.5	0
BBC_BR2	06/19/15	08/20/15	1.9	5	5	26.5	24.0	0
BBC_EP3	07/13/15	08/25/15	0.2	4	4	25.0	23.0	0
BBC_EP3	07/05/16	08/15/16	0.2	3	3	27.5	24.3	0
BBC_EP3	07/06/17	08/17/17	0.2	4	4	25.0	23.9	0
BBC_EP3	07/10/18	08/07/18	0.2	3	3	27.8	26.1	0
BBC_EP3	07/11/19	08/15/19	0.2	4	4	26.0	24.6	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_EP3	2015	0.2	3	0.29	0.49	0.37	4	3.63	7.30	6.12	1	0
BBC_EP3	2016	0.2	--	--	--	--	3	6.60	10.45	8.37	0	1
BBC_EP3	2017	0.2	2	0.43	0.53	0.48	4	3.58	10.35	7.35	1	1
BBC_EP3	2018	0.2	1	0.36	0.36	0.36	3	2.40	7.72	4.78	2	0
BBC_EP3	2019	0.2	2	0.34	0.71	0.52	4	7.41	9.62	8.58	0	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_BR1	06/20/17	06/20/17	1	1.9	1.9	1.9
BBC_BR1	08/11/18	08/11/18	1	2.1	2.1	2.1
BBC_BR2	07/22/15	07/22/15	1	2.0	2.0	2.0

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_EP3	07/13/15	08/25/15	0.2	4	0.007	0.017	0.012
BBC_EP3	07/05/16	08/15/16	0.2	3	0.004	0.010	0.007
BBC_EP3	07/06/17	08/17/17	0.2	4	0.005	0.015	0.009
BBC_EP3	07/10/18	08/07/18	0.2	3	0.004	0.005	0.004
BBC_EP3	07/11/19	08/15/19	0.2	4	0.004	0.020	0.009

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Back River (MA95-47); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Back River (MA95-47): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0722 sq mi (84%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB47.1	Back River	Conditionally Approved	0.00750	8.7%
BB47.2	Back River and Eel Pond	Conditionally Approved	0.05328	61.8%
BB47.3	Back River	Prohibited	0.00090	1.0%
BB47.4	Plow Penny Road	Prohibited	0.01048	12.2%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Back River (MA95-47) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	

No *Enterococci* bacteria data are available to assess the Primary Contact Recreational Use for Back River (MA95-47) so it is Not Assessed.

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Back River (MA95-47): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0722 sq mi (84%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Back River (MA95-47) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Back River (MA95-47): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0722 sq mi (84%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Barrett Pond (MA95004)

Location:	Carver.
AU Type:	FRESHWATER LAKE
AU Size:	11 ACRES
Classification/Qualifier:	B

No usable data were available for Barrett Pond (MA95004) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	2	None		Unchanged

Bates Pond (MA95007)

Location:	Carver.
AU Type:	FRESHWATER LAKE
AU Size:	19 ACRES
Classification/Qualifier:	B

No usable data were available for Bates Pond (MA95007) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Beaverdam Creek (MA95-53)

Location:	Estuarine portion just south of the outlet from cranberry bog southeast of Route 6, Wareham to confluence with Wewantic River, Wareham.
AU Type:	ESTUARY
AU Size:	0.04 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Estuarine Bioassessments		Unchanged
5	5	Fecal Coliform	36172	Unchanged
5	5	Nitrogen, Total		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Source Unknown (N)	X					

Designated Use Attainment Decisions

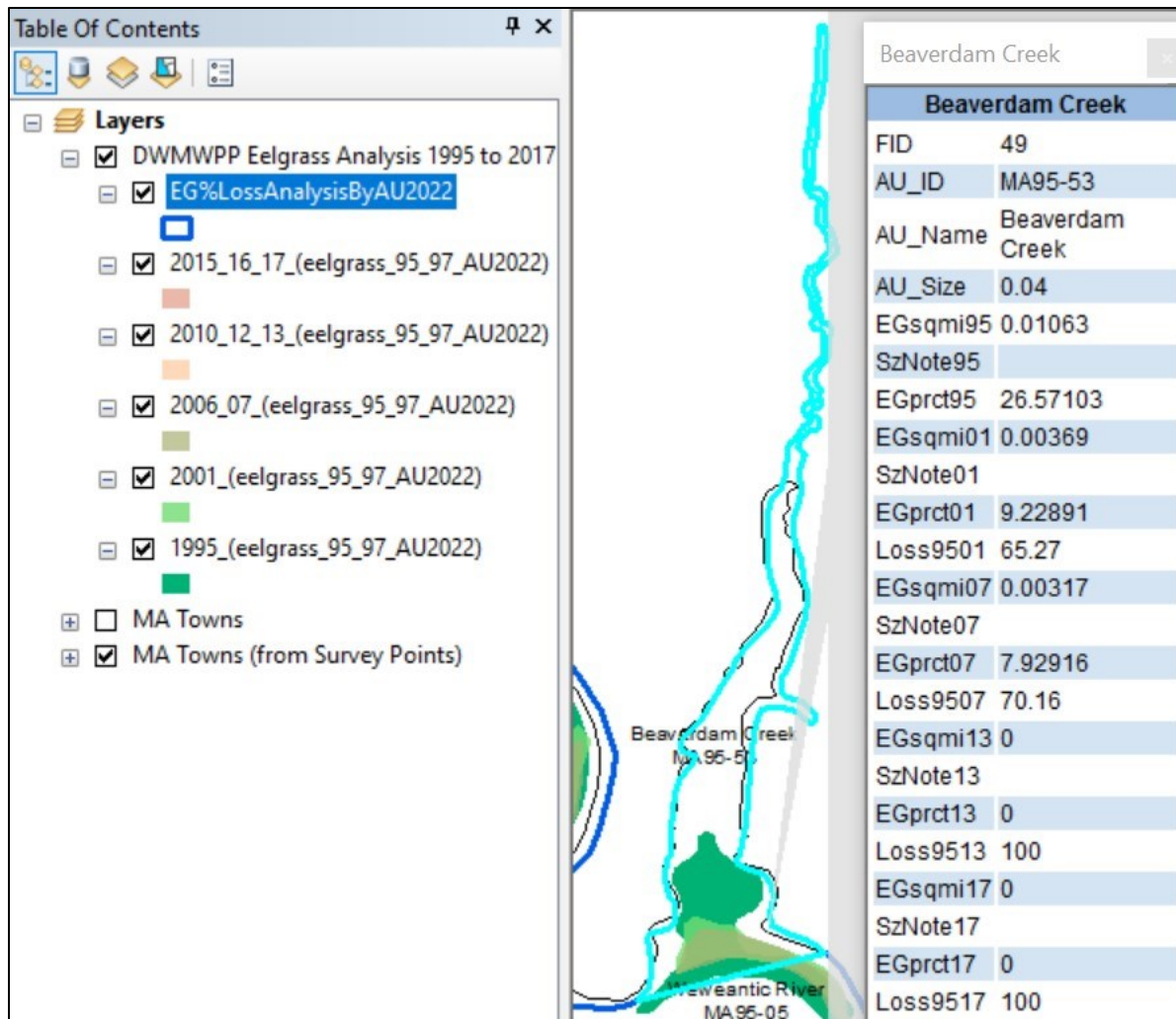
Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
The MassDEP Eelgrass Mapping Project documented a complete loss of eelgrass bed habitat in Beaverdam Creek after 2007.	
There are no other data available to assess the Aquatic Life Use for Beaverdam Creek (MA95-53), so it will continue to be assessed as Not Supporting with Estuarine Bioassessments and Total Nitrogen impairments being carried forward.	

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Beaverdam Creek MA95-53 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented a complete loss of eelgrass bed habitat in Beaverdam Creek after 2007.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Beaverdam Creek (MA95-53); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Beaverdam Creek (MA95-53): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0316 sq mi (78%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is <100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB35.1	Beaver Dam Creek	Prohibited	0.00072	1.8%
BB35.5	Middle River	Conditionally Approved	0.03084	76.2%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Beaverdam Creek (MA95-53) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Beaverdam Creek (MA95-53) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Beaverdam Creek (MA95-53): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0316 sq mi (78%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Beaverdam Creek (MA95-53) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Beaverdam Creek (MA95-53): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0316 sq mi (78%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Big Rocky Pond (MA95119)

Location:	(Rocky Pond) Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	18 ACRES
Classification/Qualifier:	B

No usable data were available for Big Rocky Pond (MA95119) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Big Sandy Pond (MA95011)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	133 ACRES
Classification/Qualifier:	B

No usable data were available for Big Sandy Pond (MA95011) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Blackmore Reservoir (MA95015)

Location:	Wareham.
AU Type:	FRESHWATER LAKE
AU Size:	43 ACRES
Classification/Qualifier:	B

No usable data were available for Blackmore Reservoir (MA95015) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Bourne Pond (MA95016)

Location:	northern side of Cape Cod Canal, Bourne.
AU Type:	FRESHWATER LAKE
AU Size:	11 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	4c	(Fish Passage Barrier*)		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Hydrostructure Impacts on Fish Passage (Y)	X				

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary DMF biologists note that the Bourne Pond outlet channel causes passage limitation to diadromous fish between Bourne Pond (MA95016) and the downstream i.e., Bourne Pond Brook AU (MA95-102). The outlet channel was given a passage score of "7" on a 0-10 scale (with 10 equating to no possible passage), indicating that it is a severe impediment to the passage of the targeted fish species, river herring and American eel. The population score was 1. DMF further noted that this area experiences low flow, the access is tide dependent, and the small size of the pond limits the potential of the habitat. The Aquatic Life Use for Bourne Pond (MA95016) is assessed as Not Supporting based on the barrier to diadromous fish passage at the outlet channel. A Fish Passage Barrier impairment is being added.	

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note that the Bourne Pond outlet structure causes passage limitation to diadromous fish between Bourne Pond (MA95016) and Bourne Pond Brook (MA95-102). This structure was given a passage score of "7" on a 0-10 scale (with 10 equating to no possible passage), indicating that the outlet is a severe impediment to the passage of the targeted fish species, river herring and American eel. The population score was noted to be "1". DMF further noted that this area experiences low flow; the access is tide dependent, and the small size of the pond limits the potential of the habitat. The Aquatic Life Use for Bourne Pond (Assessment Unit MA95016) is assessed as Not Supporting based on the barrier to diadromous fish passage at the outlet structure.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Bourne Pond (MA95016); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Bourne Pond (MA95016) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for Bourne Pond (MA95016) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Bourne Pond (MA95016) so it is Not Assessed.	

Brant Island Cove (MA95-93)

Location:	Waters landward of a line from Point May, Mattapoisett to the southwestern edge of Mattapoisett Neck, Mattapoisett.
AU Type:	ESTUARY
AU Size:	0.21 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	5	Fecal Coliform		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			

Recommendations

2022 Recommendations
ALU: Conduct DO monitoring throughout the water column in the open waters of Brant Island Cove AU (MA95-93) (away from shore), to better evaluate the nature and extent of possible low DO conditions and potential need for impairment.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an increase of eelgrass bed habitat in Brant Island Cove between 1995 and 2017 (0.003 miles² to 0.08 miles², respectively), all which has grown in at the southern/downstream end of the AU. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in Brant Island Cove, Mattapoisett (MA95-93) in the summers of 2015-2019 as follows; just offshore from a beach in the north-west corner of the AU (BBC_BI1A), at the mouth of the north-east cove (locally known as Hammonds Cove) (BBC_BI2), and about half way down the AU on the west side, from a dock in the “Brandt Cove Marina” (BBC_BI1). Monitoring (the majority done at BBC_BI1) was conducted in the surface waters, as well as at depths averaging 0.4m at BBC_BI1A to anywhere from 1.4-1.9m at BBC_BI1, and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 27.0°C (n=184). The minimum dissolved oxygen (DO) concentration was 3.0mg/L (n=186) and was frequently <6.0mg/L (i.e., 10-48% of the measurements were <6.0mg/L on a yearly basis, with a couple of exceptions <10%); it should be noted that the excursions were not usually severe (<5.0mg/L 12 times overall or ~6% of the measurements). In addition, the yearly DO averages ranged from 5.5-7.6mg/L (only <6.0mg/L in 2016 at BBC_BI1, at the surface and at depth of 1.9m). Though the low DO concentrations are of concern, since these measurements were taken in a marina, they may not be fully representative of the water quality conditions of the AU. Nutrient sampling efforts (ebb tides in May – September n=13, maximum measurement 0.59mg/L) documented seasonal average total nitrogen concentrations for sites/year with n>2 samples of 0.43 and 0.39mg/L at BBC_BI1 in 2015 and 2018 respectively. The chlorophyll *a* maximum was 14.3µg/L, >5µg/L seven times, and just once >10µg/L (n=23). Yearly average Secchi disk depths at BBC_BI1 ranged from 1.4-1.7m, though one measurement done at BBC_BI1A was 0.7m. Ammonia-nitrogen concentrations ranged from 0.004 to 0.03mg/L (n=23), though TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use of Brant Island Cove (MA95-93) is assessed as Fully Supporting based on the increase of eelgrass bed habitat documented at the southern end of the AU by the MassDEP between 1995 and 2017 and the generally good water quality conditions documented by BBC staff/volunteers in 2015-2019. An Alert is being identified for low DO at the Brandt Cove Marina sampling site in 2015-2019 and a recommendation is being made for additional monitoring to better evaluate the need for future possible impairment.

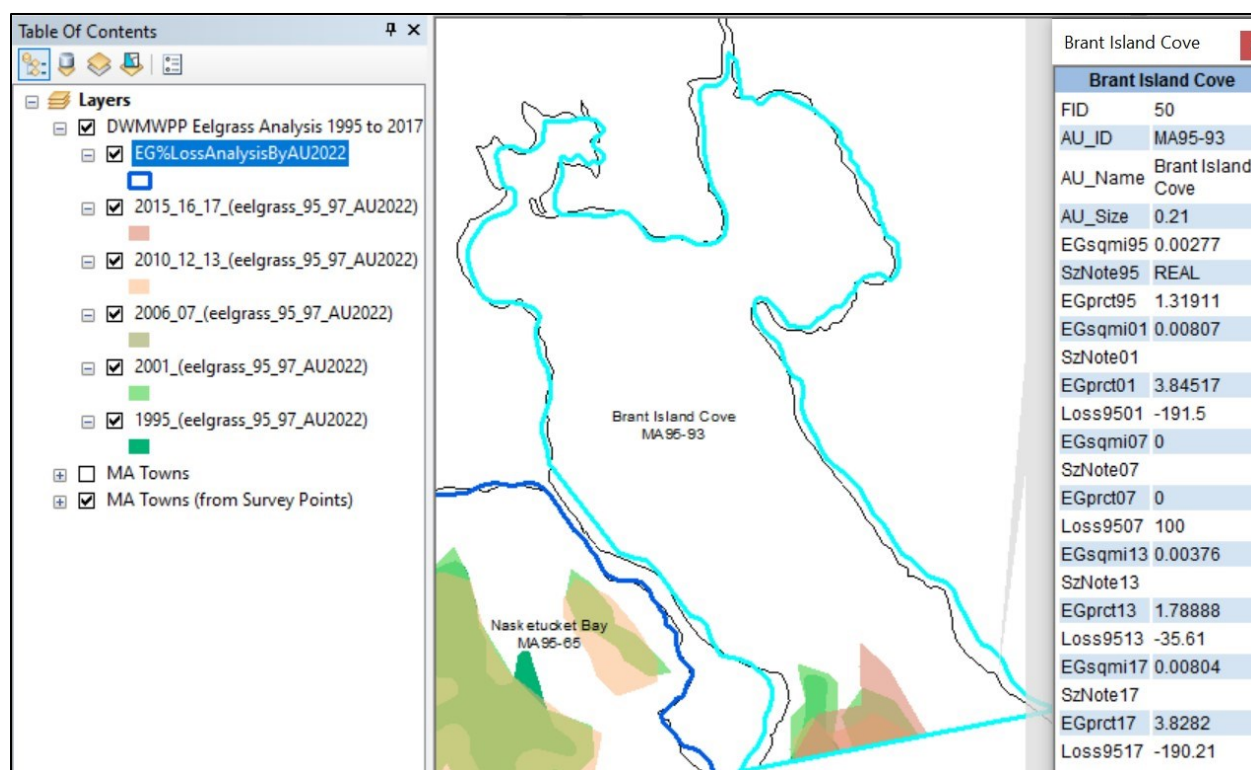
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_BI1	Buzzards Bay Coalition	Water Quality	Brant Island Cove	Brant Island Cove, Mattapoisett	41.629229	-70.820548
BBC_BI1A	Buzzards Bay Coalition	Water Quality	Brant Island Cove	Brant Island Cove, Mattapoisett	41.631946	-70.823432
BBC_BI2	Buzzards Bay Coalition	Water Quality	Brant Island Cove	Brant Island Cove, Mattapoisett	41.632278	-70.817194

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Brant Island Cove MA95-93 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an increase of eelgrass bed habitat in Brant Island Cove between 1995 and 2017 (0.003 miles² to 0.08 miles², respectively).

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_BI1	06/05/15	09/23/15	0.2	16	4.0	6.8	19	13	0
BBC_BI1	06/05/15	09/23/15	1.8	17	4.5	6.8	24	6	0
BBC_BI1	05/31/16	09/24/16	0.2	21	3.0	5.5	48	24	5
BBC_BI1	05/31/16	09/24/16	1.9	21	4.0	5.7	48	10	0
BBC_BI1	06/01/17	08/17/17	0.2	14	6.0	6.5	0	0	0
BBC_BI1	06/13/17	08/16/17	1.4	12	5.5	6.4	17	0	0
BBC_BI1	05/30/18	09/15/18	0.2	21	4.5	6.5	14	5	0
BBC_BI1	06/06/18	09/19/18	1.7	10	5.5	6.7	10	0	0
BBC_BI1	05/31/19	09/24/19	0.2	17	5.3	6.4	18	0	0
BBC_BI1	05/31/19	09/24/19	1.6	17	5.0	6.2	47	0	0
BBC_BI1A	06/24/15	09/23/15	0.2	15	4.5	6.3	47	7	0
BBC_BI1A	05/27/15	06/19/15	0.4	5	7.0	7.6	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_BI1	06/05/15	09/23/15	0.2	20	18	26.0	23.1	0
BBC_BI1	06/05/15	09/23/15	1.8	17	15	25.0	22.3	0
BBC_BI1	05/31/16	09/24/16	0.2	25	21	27.0	23.8	0
BBC_BI1	05/31/16	09/24/16	1.9	21	17	25.5	22.6	0
BBC_BI1	06/01/17	08/17/17	0.2	16	16	25.6	22.8	0
BBC_BI1	06/13/17	08/16/17	1.4	12	12	25.3	22.5	0
BBC_BI1	05/30/18	09/15/18	0.2	24	23	27.0	21.9	0
BBC_BI1	06/06/18	09/19/18	1.7	10	9	25.0	20.1	0
BBC_BI1	05/31/19	09/24/19	0.2	21	18	25.8	22.6	0
BBC_BI1	05/31/19	09/24/19	1.6	17	14	25.8	21.9	0
BBC_BI1A	06/24/15	09/23/15	0.2	16	14	26.0	23.9	0
BBC_BI1A	05/27/15	06/19/15	0.3	4	3	20.0	19.0	0
BBC_BI2	07/05/16	08/15/16	0.2	4	4	27.0	26.0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_BI1	2015	0.2	3	0.33	0.57	0.43	4	3.98	7.36	5.03	3	0
BBC_BI1	2016	0.2	1	0.46	0.46	0.46	4	0.10	5.77	3.48	3	0
BBC_BI1	2017	0.2	2	0.54	0.59	0.57	4	5.18	6.90	5.86	0	0
BBC_BI1	2018	0.2	3	0.38	0.40	0.39	3	2.84	3.90	3.26	3	0
BBC_BI1	2019	0.2	2	0.39	0.47	0.43	4	3.14	14.29	6.28	3	1
BBC_BI2	2016	0.2	2	0.39	0.41	0.40	4	2.47	4.30	3.32	4	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_BI1	06/05/15	09/23/15	14	1.4	2.5	1.7
BBC_BI1	06/06/16	09/17/16	19	1.0	2.3	1.6
BBC_BI1	06/20/17	08/03/17	5	1.3	1.5	1.4
BBC_BI1	06/11/18	08/07/18	6	1.2	1.8	1.5
BBC_BI1	06/11/19	09/18/19	11	1.1	2.5	1.6
BBC_BI1A	05/27/15	05/27/15	1	0.7	0.7	0.7

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_BI1	07/13/15	08/25/15	0.2	4	0.012	0.018	0.014
BBC_BI1	07/05/16	08/15/16	0.2	4	0.005	0.026	0.012
BBC_BI1	07/06/17	08/17/17	0.2	4	0.004	0.015	0.008
BBC_BI1	07/10/18	08/07/18	0.2	3	0.008	0.013	0.010
BBC_BI1	07/11/19	08/15/19	0.2	4	0.004	0.017	0.009
BBC_BI2	07/05/16	08/15/16	0.2	4	0.007	0.015	0.011

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	Please enter ALERT status
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Brant Island Cove (MA95-93); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Brant Island Cove (MA95-93): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2031 sq mi (95%). The approved shellfish growing area represents 0.1948 sq mi (91%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications, a fecal coliform impairment is being added.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB23.0	Brandt Island Cove	Approved	0.19484	90.9%
BB23.2	Leisure Shores Marina	Conditionally Approved	0.00827	3.9%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Brant Island Cove (MA95-93) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Brant Island Cove (MA95-93) so it is Not Assessed.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)**
(MassDEP Undated8)

Summary
Brant Island Cove (MA95-93): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2031 sq mi (95%). The approved shellfish growing area represents 0.1948 sq mi (91%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Brant Island Cove (MA95-93) so it is Not Assessed.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)**
(MassDEP Undated8)

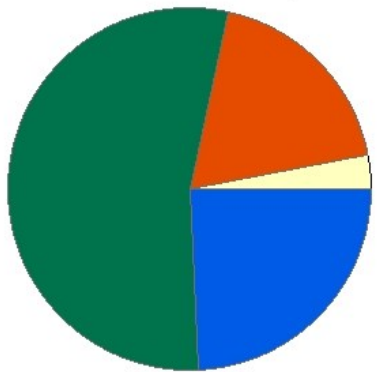
Summary
Brant Island Cove (MA95-93): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2031 sq mi (95%). The approved shellfish growing area represents 0.1948 sq mi (91%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Bread and Cheese Brook (MA95-58)

Location:	Headwaters north of Old Bedford Road, Westport to confluence with East Branch Westport River, Westport.
AU Type:	RIVER
AU Size:	4.9 MILES
Classification/Qualifier:	B

Bread and Cheese Brook - MA95-58

Watershed Area: 10.58 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	10.58	5.82	2.23	1.34
Agriculture	3%	3.8%	2.3%	3.2%
Developed	18.6%	22.1%	10.1%	13.3%
Natural	54.2%	48.2%	52.4%	48.1%
Wetland	24.2%	25.9%	35.2%	35.4%
Impervious Cover	8.3%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	5	Enterococcus	36170	Unchanged
4a	5	Fecal Coliform	36170	Unchanged
4a	5	Temperature		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Enterococcus	Source Unknown (N)				X	
Fecal Coliform	Source Unknown (N)				X	
Temperature	Source Unknown (N)	X				

Recommendations

2022 Recommendations
ALU: Conducted temperature monitoring (deploy thermistors) in Bread and Cheese Brook to evaluate sources of thermal stress.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>MA DFG biologists conducted backpack electrofishing at two sites in this Bread and Cheese Brook AU (MA95-58) in Westport in October 2019. At the most upstream site below Rt. 195 (SampleID 8559) intolerant/moderately tolerant macrohabitat generalists comprised 94% of the sample (pumpkinseed and redbfin pickerel). Further downstream at Rt. 177 (SampleID 8557) the sample was dominated by fluvial fish (74%) including Eastern brook trout. MassDEP biologists also conducted backpack electrofishing slightly further downstream of Rt. 177 adjacent to Fieldstone Drive (SampleIDs 5064, 6323, 6396, and 6352) in Septs. 2013, 2014, 2015, and Aug. 2016, respectively, as part of the Reference Site Network monitoring project. Fluvial taxa, including multiple age classes of Eastern brook trout in some samples, as well as other intolerant/moderately tolerant macrohabitat generalists were present. Notes were made in 2016 indicating that sampling efficiency was only fair due to abundant algae and that flow was the lowest seen in the past 5 years. DFG identifies this brook as a CFR and because of the presence of multiple age classes of Eastern brook trout the data will be evaluated as a Tier 1 Cold Water resource. Benthic (B0827) and water quality (W0344) monitoring was also conducted by MassDEP biologists during the summers of 2013 through 2016 as part of this project. The benthic community samples IBI scores (using the Statewide low gradient index) were indicative of satisfactory conditions in 2013, 2014, and 2015 (scores 66, 68, and 74). While the IBI score in 2016 was indicative of moderately degraded conditions (57), it is within 5 points of the threshold for satisfactory conditions and the lower score is most likely associated with the drought conditions documented for that year and not a significant decline in water quality (Drought Management Task Force 2021). Water quality sampling data included both deployed probe and discrete sampling efforts. These data can be summarized as follows: the min. dissolved oxygen (DO) ranged from 4.9 to 6.9mg/L during the four probe deployments (between 103 and 127 days each summer) and was <6.0mg/L only in summers 2013 and 2016 (the min. 7DADMin was 5.8mg/L in 2016, the drought year). The max. temperature was 28.1°C, the max. 7-DADMs ranged from 22.6 to 26.6°C exceeding 20 °C between 67 and 91 times each summer and the max. 24hr rolling average temperatures ranged from 23 to 25.7°C during the deployments with 2013 and 2016 exceeding the acute threshold of 23.5 °C. The pH was often low, ranging from 5.9 to 6.8SU (n=15, <6.0SU only twice). There were generally no physico-chemical indicators of nutrient enrichment problems (seasonal average total phosphorus concentrations ranged from 0.02-0.046mg/L (n=4 per year), max diel DO shifts ranged from 2.3mg/L in 2013 to 5.8mg/L in 2016 (most likely related to drought conditions), the max. saturation was 102%, max pH 6.8SU and there were no observations of any dense/very dense filamentous algae of 16 site visits). Specific conductance and chloride concentrations were both low (max 336µS/cm and 82mg/L n=16, respectively), as was total ammonia-nitrogen (TAN) (max 0.07mg/L, n=16 with no toxicity estimated).</p> <p>The Aquatic Life Use for Bread and Cheese Brook is assessed as Not Supporting. While the results of the biological sampling (fish and benthic data 2013-2019 and 2013-2016, respectively) as well as most water quality data collected summers 2013 to 2016 are indicative of generally good conditions, the elevated temperature (exceeding chronic evaluation thresholds for a Tier 1 Existing Use Cold Water) cannot be attributed to solely natural conditions (no dams nor water withdrawals along the brook, but the land cover does not meet the evaluation methods for natural conditions -- natural/wetland is 78.4% while impervious cover is 8.3%), so a Temperature impairment is being added. Slightly low pH is considered naturally occurring so its prior alert is being removed.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
5064	MassDEP	Fish Community	Bread and Cheese Brook	~980 ft DS of Rt 177, adjacent to fieldstone Dr	41.63267	-71.06039

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
6323	MassDEP	Fish Community	Bread and Cheese Brook	Approx 980 ft DS of Rt 177., Westport	41.63267	-71.06039
6352	MassDEP	Fish Community	Bread and Cheese Brook	, Westport	41.63267	-71.06039
6396	MassDEP	Fish Community	Bread and Cheese Brook	Approximately 980 ft DS of Rt 177., Westport	41.63267	-71.06039
8557	MassDFG	Fish Community	Bread and Cheese Brook	Above and Below Route 177, Westport	41.63301	-71.06193
8559	MassDFG	Fish Community	Bread and Cheese Brook	Below Route 195, Westport	41.66794	-71.08062
B0827	MassDEP	Benthic	Bread And Cheese Brook/	[approximately 300 meters downstream of Route 177, Westport, MA]	41.632660	-71.060383
W0344	MassDEP	Water Quality	Bread And Cheese Brook	[approximately 980 feet downstream of Route 177, Westport]	41.632660	-71.060383

Biological Monitoring Information

Benthic Macroinvertebrate Data

MassDEP Benthic Macroinvertebrate Data (2011-2017). (MassDEP Undated5)

[Index Biological Condition Class: E= Exceptional, S= Satisfactory, MD= Moderately Degraded, SD= Severely Degraded; High Gradient IBI Thresholds: E= 100-75, S= 74-55, MD= 54-35, SD= 34-0; Low Gradient IBI Thresholds: E= 100-81, S= 80-62, MD= 61-38, SD= 37-0; R qualifier = Rarefaction (100ct) <55]

Station Code	Collection Date	Collection Method	Index Type	Organism Count	Index Score	Index Biological Condition Class
B0827	07/08/13	RBP multihab	Statewide_Low_Gradient	276	66	S
B0827	07/14/14	RBP multihab	Statewide_Low_Gradient	295	68	S
B0827	08/03/15	RBP multihab	Statewide_Low_Gradient	377	74	S
B0827	08/03/16	RBP multihab	Statewide_Low_Gradient	294	57	MD

Fish Community Data and DELTS

Fish Community Data (2012-2019) Provided by MassDFG. (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net]

[Species List: AE = American Eel, CCS = Creek Chubsucker, EBT = Brook Trout, LMB = Largemouth Bass, P = Pumpkinseed, RP = Redfin Pickerel, YP = Yellow Perch]

Sample ID	Sample Date	Method	Sample Type	Total Taxa	Total Ind	EBT Ind	EBT Min Length (mm)	EBT Max Length (mm)	EBT ≤140mm Ind	SC Ind	Cold Ind %	Fluvial Ind %	Notables	CFR	Species List
6323	09/19/14	NS	TP	5	58	17	85	230	2	0	29%	31%	No	Yes	AE, CCS, EBT, RP, YP,
6396	09/16/15	BP	TP	5	88	18	74	240	6	0	20%	20%	No	Yes	AE, EBT, LMB, P, RP,

Fish Community Data (2012-2019) Provided by MassDFG. (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net; Trout= any combination of brook trout, brown trout, rainbow trout, tiger trout; Other Tier2 Species= any size and any combination of American brook lamprey, Atlantic salmon, lake chub, lake trout, longnose sucker, slimy sculpin]

[Species List: AE = American Eel, BT = Brown Trout, GS = Golden Shiner, RP = Redfin Pickerel, YP = Yellow Perch]

Sample ID	Sample Date	Method	Sample Type	Total Taxa	Total Ind	Trout ≤140mm Ind	LLS<200mm Ind	Other Tier2 Ind	Cold Ind %	Fluvial Ind %	Notables	CFR	Species List
6352	08/11/16	BP	TP	5	80	2	0	0	3%	3%	Yes*	Yes	AE, BT, GS, RP, YP,

*Notes for 6352: Efficiency-fair due to algae. AE lengths estimated from YOY, other age classes in hundreds. Lowest flow observed in past 5 years.

Filamentous algae much more abundant than normal

Fish Community Data (2012-2019) Provided by MassDFG. (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net, Gradient: H = High, L = Low; I/MT MG= Intolerant/Moderately Tolerant Macrohabitat Generalist]

[Species List: AE = American Eel, CCS = Creek Chubsucker, CP = Chain Pickerel, EBT = Brook Trout, LMB = Largemouth Bass, P = Pumpkinseed, RP = Redfin Pickerel]

Sample ID	Sample Date	Method	Sample Type	Gradient	Total Taxa	Total Ind	Cold Ind %	Fluvial Taxa	Fluvial Ind %	Intol Ind %	I/MT MG Taxa	I/MT MG Ind %	Notables	CFR	Species List
5064	09/05/13	NS	TP		2	32	0%	0	0%	0%	1	3%	No	Yes	AE, CP,
8557	10/01/19	BP	SP	L	6	19	63%	2	74%	74%	3	21%	No	Yes	AE, CCS, CP, EBT, LMB, RP,
8559	10/01/19	BP	TP		3	16	0%	0	0%	0%	2	94%	No	Yes	AE, P, RP,

*Physico-chemical Water Quality Information**DO, pH, Temperature***MassDEP Long-term Continuous Dissolved Oxygen Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)**

[7DADMin= 7-Day Average of the Daily Minima, 7DADA= 7-Day Average of the Daily Average, CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Day Count	7day Count	30day Count	DO Min (mg/L)	Min 7DADMin (mg/L)	Min 7DADA (mg/L)	Delta DO Max (mg/L)	Count CW 7DADMin <6.0	Count CW 1Day Min <5.0	Count WW Early Life Stages 7DADA <6.5	Count WW Early Life Stages 1Day Min <5.0	Count WW Other Life Stages 7DADMin <5.0	Count WW Other Life Stages 1Day Min <4.0	Count CW 30DADA <8.0	Count WW Other Life Stages 30DADA <6.0
W0344	05/29/13	09/29/13	121	109	89	5.4	7.1	7.5	2.8	0	0	0	0	0	0	13	0
W0344	05/30/14	09/15/14	109	103	80	6.2	7.3	8	3	0	0	0	0	0	0	0	0
W0344	05/29/15	09/21/15	115	103	86	6.9	7.4	7.9	2.3	0	0	0	0	0	0	0	0
W0344	05/19/16	09/28/16	133	127	104	4.9	5.8	7.6	5.8	3	1	0	0	0	0	9	0

MassDEP Discrete Dissolved Oxygen Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
W0344	05/28/13	09/30/13	3	8.1	8.8	0	0	0
W0344	06/19/14	09/16/14	4	8.2	9	0	0	0
W0344	06/24/15	09/22/15	4	8.2	8.7	0	0	0
W0344	06/15/16	09/29/16	4	7.5	8.8	0	0	0

MassDEP Long-term Continuous Temperature Data (Summer Index 2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; Max Daily Mean= Maximum 24-Hour Average, 7DADM= 7-Day Average of the Daily Maxima, 7DADA= 7-Day Average of the Daily Average, CW= Coldwater, WW= Warmwater; NOTE: In the case of more than one row of data in the same year for a site, different types of temperature probes were deployed.]

Station Code	Start Date	End Date	Index Count	7day Count	Max Daily Mean (°C)	Max Temp (°C)	Max 7DADM (°C)	Max 7DADA (°C)	Count CWTier1 7DADM >20	Count CWTier1 Daily Mean >23.5	Count CWTier2 7DADA >21	Count CWTier2 Daily Mean >24.1	Count WW 7DADM >27.7	Count WW Daily Mean >28.3
W0344	06/01/13	09/15/13	107	107	24.5	26.5	25.3	23.7	67	3	23	2	0	0
W0344	06/01/13	09/15/13	107	107	24.6	26.5	25.4	23.7	69	4	24	2	0	0
W0344	06/01/14	09/15/14	107	103	23.0	24.9	22.6	21.1	75	0	1	0	0	0
W0344	06/01/15	09/15/15	107	107	23.1	25.6	24.3	22.5	94	0	28	0	0	0
W0344	06/01/16	09/15/16	107	107	25.4	28.1	26.6	24.4	91	8	42	5	0	0

24-hour Rolling Average Calculations for MassDEP Short- and Long-term Continuous Temperature Data (Summer Index 2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater; NOTE: In the case of more than one row of data in the same year for a site, different types of temperature probes were deployed.]

Station Code	Start Date	End Date	Count Days Deployed	24hr Rolling Count	Max 24hr Avg Rolling Temp (°C)	Count CWTier1 24hr Avg Rolling >23.5 °C	Count CWTier2 24hr Avg Rolling >24.1 °C	Count WW 24hr Avg Rolling >28.3°C
W0344	06/01/13	09/15/13	107	5136	24.7	170	100	0
W0344	06/01/13	09/15/13	107	5136	24.6	148	93	0
W0344	06/01/15	09/15/15	107	5136	23.2	0	0	0
W0344	06/01/14	09/15/14	107	5136	23.0	0	0	0
W0344	06/01/16	09/15/16	107	5136	25.7	454	226	0

MassDEP Discrete Temperature Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
W0344	05/28/13	09/30/13	5	2	20.9	16.3	1	0	0	0
W0344	06/19/14	09/16/14	4	3	20.8	17.8	1	0	0	0
W0344	06/24/15	09/22/15	4	3	22.1	19.4	1	1	0	0
W0344	06/15/16	09/29/16	4	3	22.0	18.5	1	0	0	0

MassDEP Discrete pH Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

Station Code	Start Date	End Date	pH Count	pH Min (SU)	pH Max (SU)	pH Count <6.5 & >8.3	pH Count <6.0 & >8.8
W0344	05/28/13	09/30/13	3	6.1	6.3	3	0
W0344	06/19/14	09/16/14	4	5.9	6.6	3	1
W0344	06/24/15	09/22/15	4	5.9	6.4	4	1
W0344	06/15/16	09/29/16	4	6.3	6.8	1	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)**MassDEP Nutrient Enrichment Indicator Data (2011-2018).** (MassDEP Undated11) (MassDEP Undated6)

[Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	Delta DO Max (mg/L)	Delta DO Avg (mg/L)	DO Sat Max (%)	pH Max (SU)	Count Algal Obsv.	Dense/V. Dense Film/Fila. Algae
W0344	2013	4	0.024	0.054	0.038	2.8	0.8	95.9	6.3	4	0
W0344	2014	4	0.032	0.059	0.046	3.0	1.3	102.1	6.6	4	0
W0344	2015	4	0.031	0.062	0.045	2.3	1.2	99.0	6.4	4	0
W0344	2016	4	0.012	0.033	0.020	5.8	2.6	99.2	6.8	4	0

Toxics and other pollutants (metals, ammonia, chloride, chlorine)**MassDEP Total Ammonia Nitrogen (TAN) Data (2011-2018).** (MassDEP Undated11) (MassDEP Undated6)

[TAN= NH3 + NH4+]

Station Code	Data Year	TAN Count	TAN Min (mg/L)	TAN Max (mg/L)	TAN Avg (mg/L)	Count TAN >Chronic	Count TAN >Acute
W0344	2013	4	0.020	0.030	0.023	0	0
W0344	2014	4	0.020	0.040	0.028	0	0
W0344	2015	4	0.040	0.067	0.047	0	0
W0344	2016	4	0.040	0.040	0.040	0	0

MassDEP Chloride Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Chloride Count	Chloride Min (mg/L)	Chloride Max (mg/L)	Chloride Avg (mg/L)	Count Chloride >230	Count Chloride >860
W0344	2013	4	47	62	55	0	0
W0344	2014	4	59	68	63	0	0
W0344	2015	4	47	82	64	0	0
W0344	2016	4	38	72	58	0	0

MassDEP Discrete Specific Conductance Data (2011-2018) Compared to Estimated Chloride Criteria. (MassDEP Undated11) (MassDEP Undated6)

Station Code	Start Date	End Date	SpCond Count	SpCond Min (μ S/cm)	SpCond Max (μ S/cm)	Count SpCond >904	Count SpCond >994	Count SpCond >3193	Count SpCond >3512	Consecutive sets >904	Consecutive sets >994
W0344	05/28/13	09/30/13	3	207	256	0	0	0	0	0	0
W0344	06/19/14	09/16/14	4	233	286	0	0	0	0	0	0
W0344	06/24/15	09/22/15	4	212	303	0	0	0	0	0	0
W0344	06/15/16	09/29/16	4	262	336	0	0	0	0	0	0

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Bread and Cheese Brook (MA95-58); therefore the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff surveyed Bread and Cheese Brook approximately 980 ft downstream of Rt. 177, Westport (W0344) during the summers of 2013, 2014, 2015 and 2016 as part of the Reference Site Network monitoring project. There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during any of the surveys.</p> <p>The Aesthetics Use for this Bread and Cheese Brook AU (MA95-58) will continue to be assessed as Fully Supporting based on the general lack of objectionable conditions documented by MassDEP staff during the summers of 2013, 2014, 2015 and 2016.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W0344	MassDEP	Water Quality	Bread And Cheese Brook	[approximately 980 feet downstream of Route 177, Westport]	41.632660	-71.060383

Aesthetic Observations

Aesthetics Summary Statements for MassDEP Stations (2011-2018) (MassDEP Undated6)

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W0344	Bread And Cheese Brook	2013	5	MassDEP aesthetics observations for station W0344 on Bread And Cheese Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013.

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W0344	Bread And Cheese Brook	2014	4	MassDEP aesthetics observations for station W0344 on Bread And Cheese Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2014.
W0344	Bread And Cheese Brook	2015	4	MassDEP aesthetics observations for station W0344 on Bread And Cheese Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2015.
W0344	Bread And Cheese Brook	2016	4	MassDEP aesthetics observations for station W0344 on Bread And Cheese Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2016.

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W0344	2013	5	4	0
W0344	2014	4	4	0
W0344	2015	4	4	0
W0344	2016	4	4	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W0344	Bread And Cheese Brook	2013	Color	Brownish	1	5
W0344	Bread And Cheese Brook	2013	Color	Light Yellow/Tan	1	5
W0344	Bread And Cheese Brook	2013	Color	Reddish	3	5
W0344	Bread And Cheese Brook	2013	Objectionable Deposits	No	5	5
W0344	Bread And Cheese Brook	2013	Odor	None	5	5
W0344	Bread And Cheese Brook	2013	Scum	No	5	5
W0344	Bread And Cheese Brook	2013	Turbidity	None	5	5
W0344	Bread And Cheese Brook	2014	Color	Brownish	1	4
W0344	Bread And Cheese Brook	2014	Color	Light Yellow/Tan	1	4
W0344	Bread And Cheese Brook	2014	Color	Reddish	2	4

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W0344	Bread And Cheese Brook	2014	Objectionable Deposits	No	2	4
W0344	Bread And Cheese Brook	2014	Objectionable Deposits	Yes	2	4
W0344	Bread And Cheese Brook	2014	Odor	None	4	4
W0344	Bread And Cheese Brook	2014	Scum	No	1	4
W0344	Bread And Cheese Brook	2014	Scum	Yes	3	4
W0344	Bread And Cheese Brook	2014	Turbidity	None	4	4
W0344	Bread And Cheese Brook	2015	Color	Light Yellow/Tan	3	4
W0344	Bread And Cheese Brook	2015	Color	Reddish	1	4
W0344	Bread And Cheese Brook	2015	Objectionable Deposits	No	3	4
W0344	Bread And Cheese Brook	2015	Objectionable Deposits	Yes	1	4
W0344	Bread And Cheese Brook	2015	Odor	None	4	4
W0344	Bread And Cheese Brook	2015	Scum	No	4	4
W0344	Bread And Cheese Brook	2015	Turbidity	None	4	4
W0344	Bread And Cheese Brook	2016	Color	Light Yellow/Tan	1	4
W0344	Bread And Cheese Brook	2016	Color	Reddish	3	4
W0344	Bread And Cheese Brook	2016	Objectionable Deposits	No	4	4
W0344	Bread And Cheese Brook	2016	Odor	None	4	4
W0344	Bread And Cheese Brook	2016	Scum	No	4	4
W0344	Bread And Cheese Brook	2016	Turbidity	None	4	4

Primary Contact Recreation

2022 Use Attainment					Alert
Not Supporting					NO
2022 Use Attainment Summary					

No *Enterococci* or *E.coli* bacteria data are available to assess the status of the Primary Contact Recreation Use for Bread and Cheese Brook (MA95-58), so it will continue to be assessed as Not Supporting, with the *Enterococcus* and Fecal Coliform impairments being carried forward.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the status of the Secondary Contact Recreation Use for Bread and Cheese Brook (MA95-58) so it is Not Assessed.	

Broad Marsh River (MA95-49)

Location:	Headwaters in salt marsh south of Marion Road and Bourne Terrace, Wareham to confluence with the Wareham River, Wareham.
AU Type:	ESTUARY
AU Size:	0.17 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			

Recommendations

2022 Recommendations
ALU: Conduct biological (benthic) sampling and continue to conduct water quality sampling (total nitrogen and chlorophyll a with a minimum of at least three samples per summer season at the sentinel site (BBC_BR4N), as well as DO monitoring (ideally continuous) throughout the water column in the open waters (away from shore), to better evaluate nutrient related stress in Broad Marsh River (MA95-49).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at five locations throughout the Broad Marsh River AU, Wareham (MA95-49) in the summers of 2015-2019, from up to downstream as follows: BBC_BMR1N, BMR3N, BMR4N, BMR6N, and BMR6X. Four of the sample stations were located roughly in mid-channel, while BBC_BMR6X was located just offshore from Pinehurst Beach. Monitoring was conducted in just the surface waters at all locations for all sample years while at BBC_BMR6X sampling at an average depth of 0.6m was also done in 2018 and 2019. Sampling was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature (at all five stations) was 28.2°C (n=127). Dissolved oxygen (DO) was measured at two stations, BBC_BMR6N (very limited data) and BMR6X (n=87). The overall minimum DO was 4.5mg/L and was <6.0mg/L 28 times (32% of the measurements overall) and <5.0mg/L 8 times (9.2% of the measurements overall) with lowest DO deeper in the water column (i.e., 0.6m). Total nitrogen sampling (n=34, maximum 0.87mg/L) during ebb tides in July and August documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.41-0.62mg/L; however insufficient data were collected at the sentinel site (BBC_BR4N) to compare to the 0.5mg/L threshold established in the draft TMDL. The maximum chlorophyll *a* concentration was 26.9µg/L (n=57); >5µg/L 54 times and >10µg/L usually at least once per year at all five stations (~33% of the measurements overall). Secchi disk depths ranged from 0.8 to 1.9m (n=28). Ammonia-nitrogen concentrations ranged from 0.004 to 0.1mg/L (n=57), though TUs could not be calculated (lack of quality assured pH and salinity data). According to the draft Wareham River Estuary System TMDL for Total Nitrogen (MassDEP 2022), the Broad Marsh River system is a tidal salt marsh basin, naturally nutrient enriched with healthy benthic habitat (based on prior MEP studies including water quality and benthic surveys results (Howes B.L. 2013A)).

The Aquatic Life Use for Broad Marsh River (MA95-49) is assessed as Fully Supporting based primarily on the evaluation of its condition as a tidal salt marsh basin, naturally nutrient enriched with healthy benthic habitat in the draft TMDL (MassDEP 2022). Since slightly elevated chlorophyll *a* and total nitrogen concentrations were documented by BBC staff/volunteers between 2015 and 2019, alerts are being added and additional sampling is being recommended.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_BMR1N	Buzzards Bay Coalition	Water Quality	Wareham River	Broad Marsh River, Wareham	41.752572	-70.719999
BBC_BMR3N	Buzzards Bay Coalition	Water Quality	Wareham River	Broad Marsh River, Wareham	41.749973	-70.717826
BBC_BMR4N	Buzzards Bay Coalition	Water Quality	Wareham River	Broad Marsh River, Wareham	41.746442	-70.713351
BBC_BMR6N	Buzzards Bay Coalition	Water Quality	Wareham River	Broad Marsh River, Wareham	41.745254	-70.711423
BBC_BMR6X	Buzzards Bay Coalition	Water Quality	Wareham River	Broad Marsh River, Wareham	41.745591	-70.710307

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_BMR6N	07/27/15	07/27/15	0.2	1	5.9	5.9	100	0	0
BBC_BMR6N	07/18/16	07/18/16	0.2	1	6.6	6.6	0	0	0
BBC_BMR6N	08/03/17	08/17/17	0.2	2	6.3	7.0	0	0	0
BBC_BMR6X	05/28/15	09/23/15	0.2	19	7.5	9.2	0	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_BMR6X	05/30/16	09/20/16	0.2	17	5.4	7.3	6	0	0
BBC_BMR6X	07/20/17	09/20/17	0.1	7	5.8	6.6	14	0	0
BBC_BMR6X	05/30/18	09/19/18	0.6	21	4.5	5.4	81	38	0
BBC_BMR6X	06/15/19	09/23/19	0.6	19	5.0	6.0	42	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_BMR1N	07/13/15	08/25/15	0.2	3	3	22.0	21.7	0
BBC_BMR1N	07/05/16	08/01/16	0.2	2	2	25.0	24.5	0
BBC_BMR1N	07/10/18	08/21/18	0.2	3	3	26.5	24.4	0
BBC_BMR1N	07/11/19	08/15/19	0.2	4	4	25.9	24.9	0
BBC_BMR3N	07/13/15	08/25/15	0.2	3	3	22.0	21.7	0
BBC_BMR3N	07/05/16	08/01/16	0.2	2	2	26.0	25.3	0
BBC_BMR3N	07/10/18	08/21/18	0.2	4	4	27.6	25.2	0
BBC_BMR3N	07/11/19	08/15/19	0.2	4	4	25.5	24.7	0
BBC_BMR4N	07/13/15	08/25/15	0.2	3	3	22.0	21.5	0
BBC_BMR4N	07/05/16	08/01/16	0.2	2	2	25.5	24.5	0
BBC_BMR4N	07/10/18	08/21/18	0.2	4	4	27.7	25.2	0
BBC_BMR4N	07/11/19	08/15/19	0.2	4	4	25.5	24.7	0
BBC_BMR6N	07/13/15	08/25/15	0.2	4	4	23.9	22.2	0
BBC_BMR6N	07/05/16	08/01/16	0.2	3	3	27.9	25.8	0
BBC_BMR6N	08/03/17	08/17/17	0.2	2	2	25.0	24.6	0
BBC_BMR6N	07/10/18	08/21/18	0.2	4	4	27.7	25.5	0
BBC_BMR6N	07/11/19	08/15/19	0.2	4	4	25.4	24.9	0
BBC_BMR6X	05/28/15	09/23/15	0.2	19	16	24.0	21.0	0
BBC_BMR6X	05/30/16	09/20/16	0.2	17	14	28.2	22.5	0
BBC_BMR6X	07/20/17	09/20/17	0.1	7	6	27.8	23.9	0
BBC_BMR6X	05/30/18	09/19/18	0.6	21	19	25.4	22.0	0
BBC_BMR6X	06/15/19	09/23/19	0.6	19	17	26.0	22.6	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)
Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_BMR1N	2015	0.2	3	0.39	0.72	0.52	3	7.95	26.90	14.97	0	2
BBC_BMR1N	2016	0.2	1	0.81	0.81	0.81	2	7.83	20.42	14.13	0	1
BBC_BMR1N	2018	0.2	3	0.49	0.87	0.62	3	8.04	10.53	9.25	0	1
BBC_BMR1N	2019	0.2	2	0.61	0.87	0.74	4	4.49	19.92	12.13	1	2
BBC_BMR3N	2015	0.2	2	0.38	0.49	0.43	3	8.65	14.86	11.06	0	1

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_BMR3N	2016	0.2	--	--	--	--	2	8.36	9.66	9.01	0	0
BBC_BMR3N	2018	0.2	3	0.49	0.54	0.52	4	6.16	12.08	9.21	0	2
BBC_BMR3N	2019	0.2	2	0.61	0.68	0.65	4	4.57	25.66	11.62	1	1
BBC_BMR4N	2015	0.2	2	0.37	0.41	0.39	3	7.91	9.40	8.59	0	0
BBC_BMR4N	2016	0.2	1	0.70	0.70	0.70	2	10.60	15.16	12.88	0	2
BBC_BMR4N	2018	0.2	2	0.47	0.49	0.48	4	8.33	12.27	9.73	0	1
BBC_BMR4N	2019	0.2	2	0.53	0.57	0.55	4	4.08	10.98	7.90	1	1
BBC_BMR6N	2015	0.2	3	0.36	0.49	0.41	4	8.63	10.31	9.17	0	1
BBC_BMR6N	2016	0.2	1	0.68	0.68	0.68	3	7.54	18.93	12.31	0	2
BBC_BMR6N	2017	0.2	--	--	--	--	2	6.83	8.10	7.47	0	0
BBC_BMR6N	2018	0.2	3	0.47	0.57	0.50	4	8.37	13.81	9.98	0	1
BBC_BMR6N	2019	0.2	2	0.52	0.53	0.52	4	7.94	10.98	9.30	0	1
BBC_BMR6X	2016	0.2	1	0.40	0.40	0.40	1	5.54	5.54	5.54	0	0
BBC_BMR6X	2017	0.2	1	0.47	0.47	0.47	1	7.63	7.63	7.63	0	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_BMR1N	08/10/15	08/25/15	2	0.8	0.9	0.9
BBC_BMR1N	07/05/16	08/01/16	2	1.1	1.2	1.2
BBC_BMR3N	07/13/15	08/25/15	3	1.0	1.2	1.1
BBC_BMR3N	07/05/16	08/01/16	2	1.1	1.3	1.2
BBC_BMR3N	07/10/18	08/21/18	4	1.0	1.9	1.4
BBC_BMR3N	07/11/19	08/15/19	4	1.1	1.5	1.4
BBC_BMR4N	07/05/16	08/01/16	2	1.0	1.0	1.0
BBC_BMR4N	08/15/19	08/15/19	1	1.5	1.5	1.5
BBC_BMR6N	07/13/15	08/25/15	3	1.4	1.6	1.5
BBC_BMR6N	07/05/16	08/01/16	2	1.2	1.2	1.2
BBC_BMR6N	08/21/18	08/21/18	1	1.6	1.6	1.6
BBC_BMR6N	08/08/19	08/15/19	2	1.1	1.4	1.3

Toxics and other pollutants (metals, ammonia, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_BMR1N	07/13/15	08/25/15	0.2	3	0.010	0.015	0.014
BBC_BMR1N	07/05/16	08/01/16	0.2	2	0.007	0.105	0.056
BBC_BMR1N	07/10/18	08/21/18	0.2	3	0.007	0.048	0.021
BBC_BMR1N	07/11/19	08/15/19	0.2	4	0.004	0.025	0.015

BBC_BMR3N	07/13/15	08/25/15	0.2	3	0.007	0.015	0.011
BBC_BMR3N	07/05/16	08/01/16	0.2	2	0.005	0.055	0.030
BBC_BMR3N	07/10/18	08/21/18	0.2	4	0.005	0.033	0.013
BBC_BMR3N	07/11/19	08/15/19	0.2	4	0.004	0.019	0.010
BBC_BMR4N	07/13/15	08/25/15	0.2	3	0.006	0.011	0.009
BBC_BMR4N	07/05/16	08/01/16	0.2	2	0.006	0.077	0.041
BBC_BMR4N	07/10/18	08/21/18	0.2	4	0.005	0.019	0.009
BBC_BMR4N	07/11/19	08/15/19	0.2	4	0.004	0.022	0.011
BBC_BMR6N	07/13/15	08/25/15	0.2	4	0.009	0.010	0.010
BBC_BMR6N	07/05/16	08/01/16	0.2	3	0.006	0.064	0.027
BBC_BMR6N	08/03/17	08/17/17	0.2	2	0.005	0.005	0.005
BBC_BMR6N	07/10/18	08/21/18	0.2	4	0.006	0.019	0.010
BBC_BMR6N	07/11/19	08/15/19	0.2	4	0.004	0.039	0.018
BBC_BMR6X	08/15/16	08/15/16	0.2	1	0.008	0.008	0.008
BBC_BMR6X	07/20/17	07/20/17	0.2	1	0.010	0.010	0.010

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Broad Marsh River (MA95-49); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Broad Marsh River (MA95-49): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1525 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB36.11	Algelo Avenue	Prohibited	0.02064	12.3%
BB36.14	Tempest Knob	Conditionally Approved	0.00006	0.0%
BB36.8	Broad Marsh River	Conditionally Approved	0.09859	58.8%
BB36.9	North End of the River	Prohibited	0.03316	19.8%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Broad Marsh River (MA95-49) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There is one beach in Broad Marsh River, Wareham (MA95-49) known as Pinehurst (ID 3179). This beach was never posted with any swimming advisories between 2014 and 2019.</p> <p>The Primary Contact Recreational Use for Broad Marsh River (MA95-49) is assessed as Fully Supporting since there were no swimming advisory postings at the Pinehurst Beach between 2014 and 2019.</p>	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
3179	Pinehurst/Wareham	41.74580	-70.71060	41.74574	-70.71020	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
<p>Broad Marsh River (MA95-49): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1525 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.</p>

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There is one beach in Broad Marsh River, Wareham (MA95-49) known as Pinehurst (ID 3179). This beach was never posted with any swimming advisories between 2014 and 2019.</p> <p>The Secondary Contact Recreational Use for Broad Marsh River (MA95-49) is assessed as Fully Supporting since there were no swimming advisory postings at the Pinehurst Beach between 2014 and 2019.</p>	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
<p>Broad Marsh River (MA95-49): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1525 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.</p>

Butler Cove (MA95-77)

Location:	just south of Buttermilk Bay, Wareham.
AU Type:	ESTUARY
AU Size:	0.05 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Estuarine Bioassessments		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					

Recommendations

2022 Recommendations
ALU: Conduct total nitrogen sampling (at least three times per season at mid-ebb tide) as well as primary producer biological screening and DO measurements, in the open waters (away from shore), to better evaluate the nature and extent of possible nutrient enrichment impairments for this Butler Cove AU (MA95-77).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
<p>The MassDEP Eelgrass Mapping Project documented a complete loss of eelgrass bed habitat in Butler Cove after 2007. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at one location in Butler Cove, Wareham (MA95-77) in the summers of 2015-2019, at the inner end of the cove from a dock (BBC_BC2). Monitoring was conducted in the surface waters, as well as at average depths ranging from 0.5 to 1.0m and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 24°C (n=58). The minimum dissolved oxygen (DO) concentration was 5mg/L (n=38); <6.0mg/L nine times (~24% of the measurements) with measurements <6.0mg/L criterion slightly more frequently at depth. Total nitrogen sampling (n=17) during ebb tides in July and August documented seasonal average total nitrogen concentrations between 0.39 and 0.7mg/L with averages >0.4mg/L in four of five years. The maximum chlorophyll <i>a</i> concentration was 19.58µg/L (n=20); >5µg/L 15 times and >10µg/L four times (20%). The single Secchi disk depth in August 2018 was 0.8m. Ammonia-nitrogen concentrations were low (range 0.004 to 0.098mg/L, n=20), but TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for Butler Cove (MA95-77) will continue to be assessed as Not Supporting based on the loss of eelgrass bed habitat with the Estuarine Bioassessments impairment being carried forward. Alerts for evidence of elevated chlorophyll <i>a</i> and total nitrogen are being added based on data collected by BBC staff/volunteers between 2015 and 2019. Additional sampling at a more representative location is being recommended.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_BC2	Buzzards Bay Coalition	Water Quality	Butler Cove	Butler Cove, Wareham	41.748287	-70.630937

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Butler Cove MA95-77 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented a complete loss of eelgrass bed habitat in Butler Cove after 2007.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_BC2	06/10/15	08/20/15	0.5	6	5.5	6.3	17	0	0
BBC_BC2	06/17/16	06/30/16	0.2	2	5.0	6.3	50	0	0
BBC_BC2	06/06/16	08/04/16	0.7	7	5.0	6.2	43	0	0
BBC_BC2	06/22/17	08/17/17	0.2	3	6.0	6.8	0	0	0
BBC_BC2	06/22/17	08/17/17	0.8	7	5.0	6.1	43	0	0
BBC_BC2	06/12/18	06/12/18	0.2	1	8.0	8.0	0	0	0
BBC_BC2	06/12/18	06/21/18	1.1	2	7.0	7.3	0	0	0
BBC_BC2	07/03/19	09/10/19	0.2	3	6.5	7.0	0	0	0
BBC_BC2	06/20/19	09/10/19	0.8	7	5.5	7.1	14	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_BC2	07/13/15	08/25/15	0.2	4	4	22.0	21.0	0
BBC_BC2	06/10/15	08/20/15	0.5	6	6	22.0	18.3	0
BBC_BC2	06/17/16	08/15/16	0.2	6	6	24.0	21.2	0
BBC_BC2	06/06/16	08/04/16	0.7	7	7	20.0	17.9	0
BBC_BC2	06/22/17	08/17/17	0.2	6	6	21.0	19.8	0
BBC_BC2	06/22/17	08/17/17	0.8	7	7	21.0	18.3	0
BBC_BC2	06/12/18	08/21/18	0.2	5	5	23.0	20.0	0
BBC_BC2	06/12/18	07/10/18	1.0	3	3	18.5	16.5	0
BBC_BC2	07/03/19	09/10/19	0.2	7	7	21.0	20.5	0
BBC_BC2	06/20/19	09/10/19	0.8	7	7	21.0	19.9	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)**Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_BC2	2015	0.2	4	0.29	0.44	0.39	4	4.29	9.54	7.18	1	0
BBC_BC2	2016	0.2	4	0.40	0.87	0.58	4	3.24	13.49	7.33	2	1
BBC_BC2	2017	0.2	3	0.44	0.58	0.52	3	4.37	9.95	6.83	1	0
BBC_BC2	2018	0.2	--	--	--	--	4	6.62	19.58	12.06	0	2
BBC_BC2	2018	0.7	3	0.62	0.85	0.70	1	5.86	5.86	5.86	0	0
BBC_BC2	2019	0.2	3	0.42	0.59	0.52	4	3.74	12.22	7.03	1	1

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_BC2	08/21/18	08/21/18	1	0.8	0.8	0.8

Toxics and other pollutants (metals, ammonia, chlorine)**Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_BC2	07/13/15	08/25/15	0.2	4	0.015	0.040	0.028
BBC_BC2	07/05/16	08/15/16	0.2	4	0.007	0.098	0.033

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_BC2	07/20/17	08/17/17	0.2	3	0.025	0.059	0.042
BBC_BC2	07/10/18	08/21/18	0.2	4	0.009	0.033	0.020
BBC_BC2	07/10/18	07/10/18	0.9	1	0.009	0.009	0.009
BBC_BC2	07/11/19	08/15/19	0.2	4	0.004	0.071	0.038

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Butler Cove (MA95-77); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Insufficient Information	YES
2022 Use Attainment Summary	
Butler Cove (MA95-77): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0499 sq mi (96%). The approved shellfish growing area represents 0.049 sq mi (94%). The prohibited shellfish growing area represents 0.0008 sq mi (2%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB43.0	Fishermen Cove	Approved	0.04897	94.4%
BB43.2	Butler Cove	Prohibited	0.00079	1.5%
BB43.4	Macos and Budds	Conditionally Approved	0.00015	0.3%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Butler Cove (MA95-77) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Butler Cove (MA95-77) so it is Not Assessed.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Butler Cove (MA95-77): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0499 sq mi (96%). The approved shellfish growing area represents 0.049 sq mi (94%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Butler Cove (MA95-77) so it is Not Assessed.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Butler Cove (MA95-77): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0499 sq mi (96%). The approved shellfish growing area represents 0.049 sq mi (94%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Buttermilk Bay (MA95-01)

Location:	Bourne/Wareham.
AU Type:	ESTUARY
AU Size:	0.67 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Estuarine Bioassessments		Unchanged
5	5	Fecal Coliform	36172	Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)	X					

Recommendations

2022 Recommendations
ALU: Conduct total nitrogen sampling (at least three times per season at mid-ebb tide) as well as primary producer biological screening and DO measurements, to confirm the extent of continuing nutrient enrichment impairments for this Buttermilk Bay AU (MA95-01). Monitor the AU for improvements.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented a complete loss of eelgrass bed habitat in Buttermilk Bay after 1995 (i.e., none was observed between 2001 and 2017 surveys). The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at six locations in Buttermilk Bay, Bourne/Wareham (MA95-01) in the summers 2015 through 2019, from inner to outer as follows: at the inner end of the AU close to the discharge of Little Buttermilk Bay (BBC_LB1), at the outer edge of Queen Sewell Cove (BBC_BB2), in the middle of the bay (BBC_BB1), on the north bank just off Pine Ridge Rd (BBC_BB5), in the middle of Miller Cove (BBC_BB3), and from a dock just north of Rt.6 (BBC_BB4). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at BBC_BB4 (at average depths ranging from 2.2 to 2.7m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 27°C (n=285). The minimum dissolved oxygen (DO), only monitored at BBC_BB4, was 4.0mg/L (n=189); <6.0mg/L 20 times (11% of the measurements) and <5.0mg/L only four times overall. Total nitrogen sampling (n=85) during ebb tides between June and September documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.28-0.46mg/L (>0.4mg/L three times). The maximum chlorophyll *a* concentration was 18.05µg/L (n=144); >5µg/L 69 times and >10µg/L 15 times (over half at the Queen Sewell Cove sampling location BBC_BB2 between 1 and 3 times a year). Secchi disk depth (throughout the AU) ranged from 0.7 to 3.4m and ammonia-nitrogen concentrations were low, (range 0.004 to 0.05mg/L, n=114), though TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for Buttermilk Bay (MA95-01) will continue to be assessed as Not Supporting, based on the loss of eelgrass bed habitat and water quality data collected by the BBC staff/volunteers in 2015-2019 which continue to indicate of nutrient enrichment stress. The Estuarine Bioassessments and Nutrient/Eutrophication Biological Indicators impairments are both being carried forward.

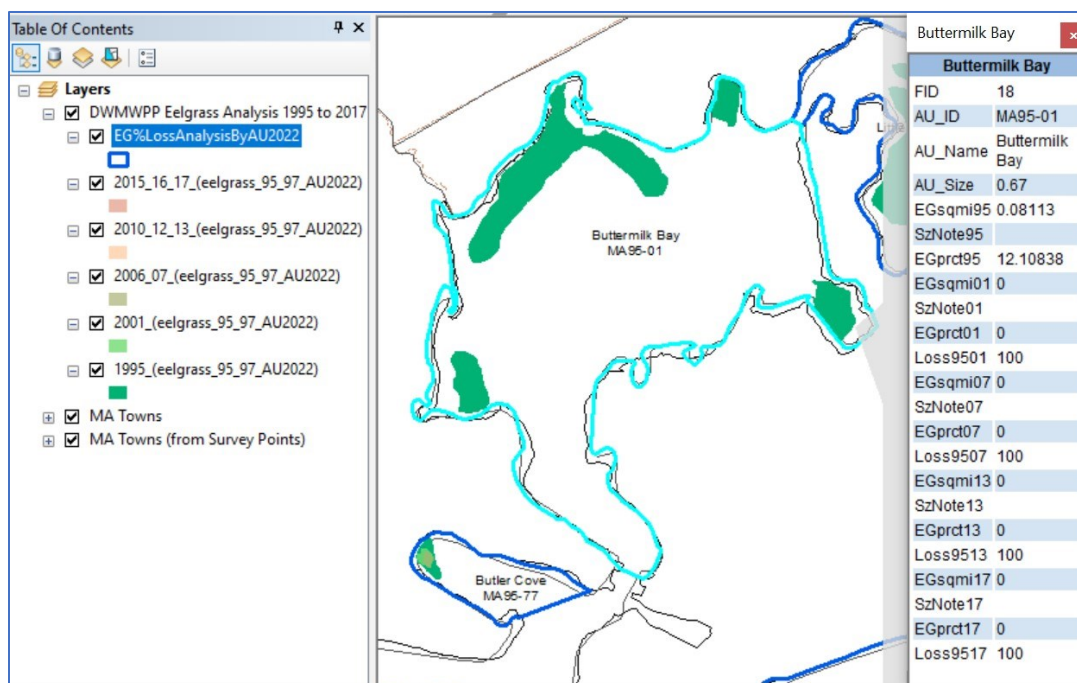
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_BB1	Buzzards Bay Coalition	Water Quality	Buttermilk Bay	Buttermilk Bay, Bourne	41.757986	-70.622111
BBC_BB2	Buzzards Bay Coalition	Water Quality	Buttermilk Bay	Buttermilk Bay, Bourne	41.757599	-70.611882
BBC_BB3	Buzzards Bay Coalition	Water Quality	Buttermilk Bay	Buttermilk Bay, Wareham	41.754256	-70.628691
BBC_BB4	Buzzards Bay Coalition	Water Quality	Buttermilk Bay	Buttermilk Bay, Wareham	41.749385	-70.623901
BBC_BB5	Buzzards Bay Coalition	Water Quality	Buttermilk Bay	Buttermilk Bay, Bourne	41.762982	-70.624804
BBC_LB1	Buzzards Bay Coalition	Water Quality	Buttermilk Bay	Little Buttermilk Bay, Bourne	41.762816	-70.613245

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Buttermilk Bay MA95-01 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented a complete loss of eelgrass bed habitat in Buttermilk Bay MA95-01 after 1995.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_BB4	06/11/15	09/23/15	0.2	21	6.6	8.3	0	0	0
BBC_BB4	06/11/15	09/23/15	2.3	21	6.2	8.0	0	0	0
BBC_BB4	03/08/16	09/26/16	0.2	22	4.0	6.7	18	9	0
BBC_BB4	06/07/16	09/26/16	2.3	20	4.0	6.5	20	10	0
BBC_BB4	01/09/17	09/19/17	0.2	27	5.1	6.6	19	0	0
BBC_BB4	05/31/17	09/16/17	2.2	21	5.5	6.5	10	0	0
BBC_BB4	05/30/18	10/18/18	0.2	21	5.5	6.8	10	0	0
BBC_BB4	05/30/18	09/05/18	2.2	17	5.5	6.6	18	0	0
BBC_BB4	05/28/19	10/22/19	0.2	15	6.3	7.5	0	0	0
BBC_BB4	06/25/19	08/13/19	2.7	4	6.3	7.1	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_BB1	07/13/15	08/25/15	0.2	4	4	20.0	19.0	0
BBC_BB1	07/18/16	08/15/16	0.2	3	3	26.0	22.7	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_BB1	07/06/17	08/17/17	0.2	4	4	25.5	23.6	0
BBC_BB1	07/10/18	08/21/18	0.2	4	4	25.0	23.6	0
BBC_BB1	07/11/19	08/15/19	0.2	4	4	23.0	22.4	0
BBC_BB2	07/13/15	08/25/15	0.2	4	4	20.0	19.0	0
BBC_BB2	07/18/16	08/15/16	0.2	3	3	27.0	23.3	0
BBC_BB2	07/06/17	08/17/17	0.2	4	4	26.0	24.4	0
BBC_BB2	07/10/18	08/21/18	0.2	4	4	26.0	24.4	0
BBC_BB2	07/11/19	08/15/19	0.2	4	4	24.0	22.5	0
BBC_BB3	07/13/15	08/25/15	0.2	4	4	19.5	18.8	0
BBC_BB3	07/18/16	08/15/16	0.2	3	3	25.0	21.7	0
BBC_BB3	07/06/17	08/17/17	0.2	4	4	25.0	22.6	0
BBC_BB3	07/10/18	08/21/18	0.2	4	4	23.0	22.1	0
BBC_BB3	07/11/19	08/15/19	0.2	4	4	22.0	21.8	0
BBC_BB4	05/29/15	09/24/15	0.2	32	29	24.0	18.7	0
BBC_BB4	06/03/15	09/23/15	2.3	23	22	23.3	18.3	0
BBC_BB4	01/06/16	09/26/16	0.2	28	23	27.0	21.0	0
BBC_BB4	06/07/16	09/26/16	2.3	21	18	24.0	20.9	0
BBC_BB4	01/09/17	09/19/17	0.2	31	25	24.5	19.3	0
BBC_BB4	05/31/17	09/16/17	2.2	21	19	21.7	18.7	0
BBC_BB4	05/30/18	10/18/18	0.2	25	22	24.3	21.2	0
BBC_BB4	05/30/18	09/05/18	2.2	17	16	23.0	20.2	0
BBC_BB4	05/28/19	10/22/19	0.2	18	12	22.5	21.6	0
BBC_BB4	06/25/19	08/13/19	2.7	4	4	22.0	20.9	0
BBC_BB5	07/13/15	08/25/15	0.2	4	4	20.0	18.9	0
BBC_BB5	07/18/16	08/15/16	0.2	3	3	26.0	22.7	0
BBC_BB5	07/06/17	08/17/17	0.2	4	4	26.0	23.5	0
BBC_BB5	07/10/18	08/21/18	0.2	4	4	25.0	23.4	0
BBC_BB5	07/11/19	08/15/19	0.2	4	4	23.0	22.5	0
BBC_LB1	07/13/15	08/25/15	0.2	4	4	20.0	18.9	0
BBC_LB1	07/18/16	08/15/16	0.2	3	3	27.0	23.3	0
BBC_LB1	07/06/17	08/17/17	0.2	4	4	26.5	24.5	0
BBC_LB1	07/10/18	08/21/18	0.2	4	4	26.0	24.4	0
BBC_LB1	07/11/19	08/15/19	0.2	4	4	24.0	22.9	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_BB1	2015	0.2	3	0.26	0.37	0.31	4	3.32	11.59	6.43	2	1
BBC_BB1	2016	0.2	1	0.33	0.33	0.33	3	3.47	6.24	5.20	1	0
BBC_BB1	2017	0.2	--	--	--	--	4	5.11	11.48	7.53	0	1
BBC_BB1	2018	0.2	3	0.30	0.33	0.32	4	1.65	4.93	3.90	4	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_BB1	2019	0.2	1	0.35	0.35	0.35	4	2.49	8.90	5.71	2	0
BBC_BB2	2015	0.2	3	0.34	0.47	0.40	4	4.88	14.23	8.62	1	1
BBC_BB2	2016	0.2	1	0.54	0.54	0.54	3	4.36	12.37	8.50	1	1
BBC_BB2	2017	0.2	--	--	--	--	4	7.03	18.05	11.12	0	2
BBC_BB2	2018	0.2	3	0.43	0.48	0.46	4	2.25	11.11	7.15	1	1
BBC_BB2	2019	0.2	2	0.37	0.55	0.46	4	7.22	13.87	10.85	0	3
BBC_BB3	2015	0.2	3	0.23	0.33	0.28	4	2.09	11.13	5.02	3	1
BBC_BB3	2016	0.2	3	0.32	0.37	0.35	3	3.21	4.16	3.58	3	0
BBC_BB3	2017	0.2	2	0.36	0.44	0.40	4	3.23	6.50	4.67	3	0
BBC_BB3	2018	0.2	4	0.23	0.31	0.28	4	2.37	3.57	3.02	4	0
BBC_BB3	2019	0.2	2	0.29	0.36	0.32	4	0.20	6.56	3.04	3	0
BBC_BB4	2015	0.2	7	0.20	0.41	0.29	8	2.28	9.99	5.58	4	0
BBC_BB4	2016	0.2	3	0.24	0.36	0.28	9	0.49	5.60	2.90	7	0
BBC_BB4	2017	0.2	6	0.26	0.45	0.36	10	1.31	8.12	4.19	8	0
BBC_BB4	2018	0.2	6	0.27	0.36	0.33	8	1.12	5.07	2.59	7	0
BBC_BB4	2019	0.2	7	0.32	0.47	0.38	14	0.24	6.76	4.06	9	0
BBC_BB5	2015	0.2	3	0.31	0.35	0.33	4	2.84	11.29	7.55	1	1
BBC_BB5	2016	0.2	2	0.34	0.41	0.37	3	3.95	7.36	5.13	2	0
BBC_BB5	2017	0.2	3	0.32	0.52	0.44	4	3.45	7.70	5.22	2	0
BBC_BB5	2018	0.2	2	0.32	0.43	0.37	4	2.91	5.64	4.08	3	0
BBC_BB5	2019	0.2	2	0.33	0.42	0.38	4	2.90	12.51	6.26	2	1
BBC_LB1	2015	0.2	4	0.35	0.47	0.40	4	5.47	9.41	7.21	0	0
BBC_LB1	2016	0.2	2	0.46	0.48	0.47	3	8.25	9.19	8.78	0	0
BBC_LB1	2017	0.2	1	0.37	0.37	0.37	4	5.57	10.48	7.67	0	1
BBC_LB1	2018	0.2	4	0.33	0.58	0.43	4	3.59	15.54	7.94	1	1
BBC_LB1	2019	0.2	2	0.36	0.48	0.42	4	3.63	7.62	5.71	1	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_BB1	07/27/15	07/27/15	1	1.4	1.4	1.4
BBC_BB1	08/01/16	08/01/16	1	1.8	1.8	1.8
BBC_BB1	07/11/19	08/08/19	2	1.7	1.7	1.7
BBC_BB2	07/13/15	08/10/15	3	1.4	1.7	1.5
BBC_BB2	07/18/16	08/15/16	3	1.3	1.4	1.4
BBC_BB2	07/06/17	08/03/17	2	1.4	1.7	1.6
BBC_BB2	07/24/18	07/24/18	1	1.4	1.4	1.4
BBC_BB2	08/08/19	08/08/19	1	1.6	1.6	1.6
BBC_BB3	07/25/19	07/25/19	1	1.8	1.8	1.8
BBC_BB4	05/29/15	09/24/15	25	1.5	3.4	2.4
BBC_BB4	03/08/16	09/24/16	24	0.7	2.7	1.9

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_BB4	06/06/17	09/19/17	24	1.5	2.7	2.1
BBC_BB4	05/30/18	09/05/18	21	1.5	3.0	2.1
BBC_BB4	06/25/19	08/15/19	7	1.6	2.8	2.3
BBC_BB5	07/13/15	08/25/15	3	1.3	1.5	1.4
BBC_BB5	07/18/16	08/15/16	3	1.3	1.7	1.5
BBC_BB5	08/03/17	08/03/17	1	1.5	1.5	1.5
BBC_BB5	07/24/18	07/24/18	1	1.5	1.5	1.5
BBC_BB5	08/08/19	08/08/19	1	1.7	1.7	1.7
BBC_LB1	07/13/15	08/25/15	4	1.3	1.7	1.5
BBC_LB1	07/18/16	08/15/16	3	1.3	1.5	1.4
BBC_LB1	07/20/17	08/03/17	2	1.4	1.5	1.5
BBC_LB1	07/10/18	08/21/18	4	1.5	2.5	1.8
BBC_LB1	07/11/19	08/15/19	4	1.6	1.7	1.7

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_BB1	07/13/15	08/25/15	0.2	4	0.013	0.018	0.015
BBC_BB1	07/18/16	08/15/16	0.2	3	0.005	0.024	0.012
BBC_BB1	07/06/17	08/17/17	0.2	4	0.004	0.006	0.005
BBC_BB1	07/10/18	08/21/18	0.2	4	0.004	0.015	0.008
BBC_BB1	07/11/19	08/15/19	0.2	4	0.004	0.013	0.006
BBC_BB2	07/13/15	08/25/15	0.2	4	0.011	0.016	0.013
BBC_BB2	07/18/16	08/15/16	0.2	3	0.006	0.010	0.008
BBC_BB2	07/06/17	08/17/17	0.2	4	0.004	0.006	0.005
BBC_BB2	07/10/18	08/21/18	0.2	4	0.004	0.011	0.006
BBC_BB2	07/11/19	08/15/19	0.2	4	0.004	0.008	0.006
BBC_BB3	07/13/15	08/25/15	0.2	4	0.011	0.022	0.016
BBC_BB3	07/18/16	08/15/16	0.2	3	0.007	0.025	0.014
BBC_BB3	07/06/17	08/17/17	0.2	4	0.004	0.015	0.010
BBC_BB3	07/10/18	08/21/18	0.2	4	0.004	0.019	0.009
BBC_BB3	07/11/19	08/15/19	0.2	4	0.004	0.016	0.010
BBC_BB4	06/16/15	09/24/15	0.2	8	0.008	0.032	0.018
BBC_BB4	01/06/16	09/26/16	0.2	9	0.004	0.030	0.012
BBC_BB4	01/09/17	09/19/17	0.2	10	0.004	0.032	0.013
BBC_BB4	07/10/18	10/18/18	0.2	8	0.005	0.044	0.021
BBC_BB4	05/28/19	10/22/19	0.2	14	0.004	0.046	0.018
BBC_BB5	07/13/15	08/25/15	0.2	4	0.010	0.022	0.015
BBC_BB5	07/18/16	08/15/16	0.2	3	0.005	0.034	0.016
BBC_BB5	07/06/17	08/17/17	0.2	4	0.004	0.018	0.008
BBC_BB5	07/10/18	08/21/18	0.2	4	0.004	0.041	0.015
BBC_BB5	07/11/19	08/15/19	0.2	4	0.004	0.029	0.011

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_LB1	07/13/15	08/25/15	0.2	4	0.012	0.046	0.023
BBC_LB1	07/18/16	08/15/16	0.2	3	0.009	0.014	0.011
BBC_LB1	07/06/17	08/17/17	0.2	4	0.004	0.007	0.005
BBC_LB1	07/10/18	08/21/18	0.2	4	0.005	0.024	0.013
BBC_LB1	07/11/19	08/15/19	0.2	4	0.004	0.015	0.010

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Buttermilk Bay (MA95-01); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Buttermilk Bay (MA95-01): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.625 sq mi (94%). The approved shellfish growing area represents 0.578 sq mi (87%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB44.0	Buttermilk Bay	Approved	0.57796	86.7%
BB44.11	Continental Marina	Prohibited	0.00211	0.3%
BB44.14	Wychunas Avenue	Conditionally Approved	0.00559	0.8%
BB44.3	Buttermilk Bay	Prohibited	0.00352	0.5%
BB44.4	Red Brook	Prohibited	0.00107	0.2%
BB44.5	Miller Cove	Conditionally Approved	0.03250	4.9%
BB44.7	Queen Sewell Cove	Prohibited	0.00198	0.3%
BB44.8	North Buttermilk Bay	Prohibited	0.00030	0.0%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Buttermilk Bay (MA95-01) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	

There are three beaches in Buttermilk Bay, Wareham/Bourne (MA95-01), the names and ID codes for the beaches are as follows: Hideaway Village Association (ID 2661), Indian Mound Beach (ID 5469), and Electric Avenue (ID 2660). These beaches were never posted with any advisories for swimming between 2014 and 2019.

The Primary Contact Recreational Use for Buttermilk Bay (MA95-01) is assessed as Fully Supporting since there were no swimming advisory postings at the Hideaway Village Association, Indian Mound, or Electric Avenue beaches between 2014 and 2019.

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2660	Electric Avenue/Bourne	41.74899	-70.62030	41.74841	-70.61960	0%	0%	0%	0%	0%	0%	0
2661	Hideaway Village Association/Bourne	41.76377	-70.62270	41.76374	-70.61700	0%	0%	0%	0%	0%	0%	0
5469	Indian Mound Beach/Wareham	41.76050	-70.63030	41.75730	-70.62950	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Buttermilk Bay (MA95-01): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.625 sq mi (94%). The approved shellfish growing area represents 0.578 sq mi (87%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There are three beaches in Buttermilk Bay, Wareham/Bourne (MA95-01), the names and ID codes for the beaches are as follows: Hideaway Village Association (ID 2661), Indian Mound Beach (ID 5469), and Electric Avenue (ID 2660). These beaches were never posted with any advisories for swimming between 2014 and 2019.	
The Secondary Contact Recreational Use for Buttermilk Bay (MA95-01) is assessed as Fully Supporting since there were no swimming advisory postings at the Hideaway Village Association, Indian Mound, or Electric Avenue beaches between 2014 and 2019.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

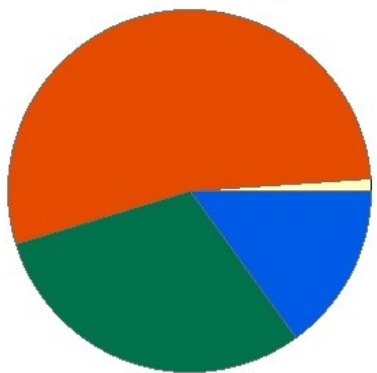
Summary
Buttermilk Bay (MA95-01): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.625 sq mi (94%). The approved shellfish growing area represents 0.578 sq mi (87%). Because the total of all shellfish growing area classifications is anything less than "approved", the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Buttonwood Brook (MA95-13)

Location:	Headwaters, Oakdale Street, New Bedford to mouth at Apponagansett Bay, Dartmouth (excluding the approximately 0.2 miles through Buttonwood Park Pond segment MA95020).
AU Type:	RIVER
AU Size:	3.6 MILES
Classification/Qualifier:	B

Buttonwood Brook - MA95-13

Watershed Area: 2.99 square miles



■ Percent Agriculture ■ Percent Natural
■ Percent Developed ■ Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.99	2.74	1.03	1.01
Agriculture	1.1%	1.2%	1.8%	1.8%
Developed	53.6%	52.4%	35.6%	34.8%
Natural	30.3%	30.6%	31.8%	32.1%
Wetland	15%	15.8%	30.8%	31.3%
Impervious Cover	26.2%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Enterococcus	36170	Unchanged
4a	4a	Escherichia Coli (E. Coli)	36170	Unchanged
4a	4a	Fecal Coliform	36170	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Enterococcus	Discharges from Municipal Separate Storm Sewer Systems (MS4) (N)				X	X
Enterococcus	Source Unknown (N)				X	X
Escherichia Coli (E. Coli)	Discharges from Municipal Separate Storm Sewer Systems (MS4) (N)				X	
Escherichia Coli (E. Coli)	Source Unknown (N)				X	
Fecal Coliform	Agriculture (Y)				X	

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Discharges from Municipal Separate Storm Sewer Systems (MS4) (N)				X	
Fecal Coliform	Source Unknown (N)				X	
Fecal Coliform	Unspecified Urban Stormwater (Y)				X	

Recommendations

2022 Recommendations
ALU: Conduct additional monitoring for nutrient enrichment indicators (especially chlorophyll <i>a</i>) and dissolved oxygen to better evaluate water quality conditions and need for any potential impairments in Buttonwood Brook. OTHER: Feeding of waterfowl in Buttonwood Park Pond should continue to be discouraged.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	

DMF biologists note one structure causing passage limitation to diadromous fish in the upstream half of Buttonwood Brook. The Buttonwood Park Dam (NATID# MA03067) was given a passage score of "10", on a 0-10 scale, indicating that the dam allows no possible passage of the targeted species, river herring and American eel. Passage is obstructed between Buttonwood Brook and the upstream AU (Buttonwood Park Pond MA95020), and the remainder of the brook upstream of the pond. The population score was noted to be "0" in this area so the AU will not be impaired for fish passage at this time. DMF biologists visited the area in 2020 and noted there was limited water quality, quantity, and spawning habitat. Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at two locations: in the middle of the AU just downstream of Buttonwood Park Pond (above Buttonwood Zoo) in New Bedford (BBC_BWB4) and further downstream at Russells Mills Rd in Dartmouth (BBC_BWB1) in the summers of 2015-2019. Monitoring was conducted in the surface waters, as well as deeper in the water column at BBC_BWB4 in 2019 (depth of ~0.5m) and was usually conducted weekly in the summer months (between 6 & 9am). The water quality data overall were generally indicative of good conditions in the brook with slightly poorer conditions downstream of Buttonwood Park Pond and good conditions at Russells Mills Rd. The max temperature was 29.6°C (above 28.3°C once at BBC_BWB4, n=72). The minimum dissolved oxygen (DO) was 4.0mg/L (n=54) and was <5.0mg/L twice at BBC_BWB4 between June and July (when anadromous fish early life stages were potentially present), though was never <4.0mg/L while the minimum DO near Russells Mills Rd was 5.5mg/L. Seasonal average total phosphorus concentrations in July and August (for sites/year with n>2 samples) were low between 0.02-0.041mg/L (overall max total phosphorus concentration was 0.059mg/L, n=25). The max chlorophyll *a* was 90.73µg/L (n=18) and was >16µg/L six times (all years but 2017) at BBC_BWB4 while the maximum concentration was only 1.1µg/L near Russells Mills Rd. Buttonwood Park Pond has been observed to carry a large number of resident/migratory waterfowl often seen being fed and low flow/stagnant conditions have been noted below the dam (Alert issue identified in prior IR reporting cycle) which may result in these higher chlorophyll/algal conditions. Ammonia-nitrogen concentrations ranged from 0.012 to 0.434mg/L (n=25), though TUs could not be calculated (lack of quality assured pH and salinity data). MassDEP staff did not observe any dense film or filamentous algae at seven sites in 2011 while conducting BST sampling from up to downstream as follows: at Walter Fuller Memorial Pkwy (W1379, n=3), just upstream of the northern perimeter fence for Buttonwood Zoo (W2325, n=3), ~40 ft downstream of "concrete footbridge" at the northern end of Buttonwood Zoo (W2326, n=3), immediately upstream of bison enclosure in Buttonwood Zoo (W2327, n=2), at the check dam within bison enclosure (W2328, n=2), just downstream of southern perimeter fence for Buttonwood Zoo (W2330, n=2), or at the culvert entrance just upstream of Brownell Ave (W2331, n=3).

The Aquatic Life Use for Buttonwood Brook (MA95-13) is assessed as Fully Supporting based on the generally good water quality conditions documented by BBC staff/volunteers in 2015-2019. The few incidences of slightly low DO and elevated chlorophyll *a* are most likely associated with the proximity of the sampling station (BBC_BWB4) to the Buttonwood Park Pond/dam. The former Alert for low flow conditions (including stagnant flow downstream from Buttonwood Park Pond) is being carried forward and recommendations will be made to discourage feeding of waterfowl in Buttonwood Park Pond and to monitor for chlorophyll *a* and DO conditions in Buttonwood Brook downstream of the pond.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1379	MassDEP	Water Quality	Buttonwood Brook	[Walter Fuller Memorial Parkway (downstream of Buttonwood Park Pond), New Bedford]	41.632064	-70.953597
W2325	MassDEP	Water Quality	Buttonwood Brook	[just upstream of northern perimeter fence for Buttonwood Zoo, New Bedford]	41.630991	-70.953251
W2326	MassDEP	Water Quality	Buttonwood Brook	[approximately 40 feet downstream of "concrete footbridge" in northern end of Buttonwood Zoo grounds, New Bedford]	41.630778	-70.952997
W2327	MassDEP	Water Quality	Buttonwood Brook	[immediately upstream of bison enclosure, Buttonwood Zoo, New Bedford]	41.629781	-70.952340
W2328	MassDEP	Water Quality	Buttonwood Brook	[at check dam within bison enclosure, Buttonwood Zoo, New Bedford]	41.629297	-70.952256
W2330	MassDEP	Water Quality	Buttonwood Brook	[just downstream of southern perimeter fence for Buttonwood Zoo, New Bedford]	41.629115	-70.952282

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2331	MassDEP	Water Quality	Buttonwood Brook	[at culvert entrance just upstream/east of Brownell Avenue, New Bedford]	41.627887	-70.953093

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_BWB1	Buzzards Bay Coalition	Water Quality	Buttonwood Brook	Buttonwood Brook, Dartmouth	41.604595	-70.955893
BBC_BWB4	Buzzards Bay Coalition	Water Quality	Buttonwood Brook	Buttonwood Brook Pond Above Zoo, New Bedford	41.631943	-70.953747

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note one structure causing passage limitation to diadromous fish in the upstream half of this AU. The Buttonwood Park Dam (NATID# MA03067) was given a passage score of "10", on a 0-10 scale, indicating that the dam allows no possible passage of the targeted species, river herring and American eel. Passage is obstructed between Buttonwood Brook and the upstream AU (Buttonwood Park Pond MA95020), as well as on to the remainder of the brook AU upstream of the pond. The population score was noted to be "0" in this area. DMF biologists visited the area in 2020 and noted that there was limited water quality, quantity and spawning habitat. The Aquatic Life Use for Buttonwood Brook (Assessment Unit MA95-13) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Buttonwood Park Dam.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Freshwater Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Average Sample depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
BBC_BWB1	06/17/15	08/26/15	0.2	13	6.8	7.5	0	0	0
BBC_BWB1	08/09/16	08/09/16	0.1	1	5.5	5.5	0	0	0
BBC_BWB1	09/14/17	09/14/17	0.1	1	8.4	8.4	0	0	0
BBC_BWB1	06/20/18	09/20/18	0.1	11	5.4	7.1	0	0	0
BBC_BWB1	06/03/19	09/10/19	0.1	12	7.5	8.3	0	0	0
BBC_BWB4	06/06/15	08/09/15	0.1	11	4.0	6.5	4	2	0
BBC_BWB4	06/11/16	06/11/16	0.1	1	6.0	6.0	0	0	0
BBC_BWB4	05/30/18	06/05/18	0.2	2	6.0	7.5	0	0	0
BBC_BWB4	05/31/19	08/15/19	0.3	2	4.9	6.2	1	0	0

Buzzards Bay Coalition Discrete Freshwater Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_BWB1	06/17/15	08/26/15	0.1	16	16	25.0	19.4	5	2	0	0
BBC_BWB1	07/05/16	08/15/16	0.1	4	4	22.0	20.7	2	0	0	0
BBC_BWB1	08/17/17	09/14/17	0.1	2	2	18.3	17.8	0	0	0	0
BBC_BWB1	06/20/18	09/20/18	0.1	14	13	22.2	19.7	6	1	0	0
BBC_BWB1	06/03/19	09/10/19	0.1	12	12	20.3	16.9	1	0	0	0
BBC_BWB4	06/06/15	08/25/15	0.1	14	14	26.0	22.4	11	8	0	0
BBC_BWB4	06/11/16	08/15/16	0.1	4	4	27.0	24.3	3	3	0	0
BBC_BWB4	07/06/17	08/17/17	0.1	2	2	23.4	23.0	2	2	0	0
BBC_BWB4	05/30/18	08/21/18	0.2	5	4	29.6	24.7	3	3	1	0
BBC_BWB4	05/31/19	08/15/19	0.5	2	1	23.9	23.9	1	1	0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

MassDEP Nutrient Enrichment Indicator Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	Delta DO Max (mg/L)	Delta DO Avg (mg/L)	DO Sat Max (%)	pH Max (SU)	Count Algal Obsv.	Dense/V. Dense Film/Fila. Algae
W1379	2011	--	--	--	--	--	--	--	--	3	0
W2325	2011	--	--	--	--	--	--	--	--	3	0
W2326	2011	--	--	--	--	--	--	--	--	3	0
W2327	2011	--	--	--	--	--	--	--	--	2	0
W2328	2011	--	--	--	--	--	--	--	--	2	0
W2330	2011	--	--	--	--	--	--	--	--	2	0
W2331	2011	--	--	--	--	--	--	--	--	3	0

Buzzards Bay Coalition Freshwater Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	DO Sat Max (%)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count >16µg/L
BBC_BWB1	2015	0.1	4	0.023	0.059	0.041	--	4	0.79	1.71	1.12	0
BBC_BWB1	2016	0.1	3	0.027	0.04	0.032	--	3	0.24	1.11	0.55	0
BBC_BWB1	2017	0.2	1	0.022	0.022	0.022	--	1	0.55	0.55	0.55	0
BBC_BWB1	2018	0.2	3	0.013	0.024	0.020	--	3	0.19	0.58	0.37	0
BBC_BWB4	2015	0.1	4	0.019	0.026	0.023	--	4	3.89	51.86	23.74	2
BBC_BWB4	2016	0.1	3	0.021	0.031	0.028	--	3	5.26	55.99	22.38	1
BBC_BWB4	2017	0.1	2	0.011	0.034	0.023	--	2	6.77	11.94	9.36	0
BBC_BWB4	2018	0.2	3	0.015	0.043	0.027	--	3	9.38	90.73	50.39	2
BBC_BWB4	2019	0.3	2	0.024	0.029	0.027	--	2	9.18	24.89	17.04	1

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_BWB1	07/13/15	08/25/15	0.1	4	0.015	0.031	0.023
BBC_BWB1	07/05/16	08/15/16	0.1	2	0.005	0.057	0.031
BBC_BWB1	07/18/16	07/18/16	0.1	1	0.018	0.018	0.018
BBC_BWB1	08/17/17	08/17/17	0.2	1	0.035	0.035	0.035
BBC_BWB1	07/10/18	08/21/18	0.2	3	0.026	0.045	0.035
BBC_BWB4	07/13/15	08/25/15	0.1	4	0.046	0.098	0.070
BBC_BWB4	07/05/16	08/15/16	0.1	2	0.055	0.134	0.095
BBC_BWB4	07/18/16	07/18/16	0.1	1	0.118	0.118	0.118
BBC_BWB4	07/06/17	08/17/17	0.1	2	0.027	0.167	0.097
BBC_BWB4	07/10/18	08/21/18	0.2	3	0.007	0.434	0.152
BBC_BWB4	08/08/19	08/15/19	0.3	2	0.004	0.103	0.054

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Buttonwood Brook (MA95-13); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff surveyed Buttonwood Brook at seven sites in New Bedford during the summer of 2011 as part of a Bacteria Source Tracking (BST) project, from upstream to downstream as follows: Walter Fuller Memorial Parkway (downstream of Buttonwood Park Pond) (W1379, n=3), just upstream of the northern perimeter fence for Buttonwood Zoo (W2325, n=3), ~40 ft downstream of "concrete footbridge" in northern end of Buttonwood Zoo (W2326, n=3), immediately upstream of bison enclosure, Buttonwood Zoo (W2327, n=3), at check dam within bison enclosure, Buttonwood Zoo (W2328, n=2), just downstream of the southern perimeter fence for Buttonwood Zoo (W2330, n=2), and at the culvert entrance just upstream/east of Brownell Ave (W2331, n=3). No objectionable conditions (i.e., odors, deposits, growths, or turbidity) were observed during any of the surveys.</p> <p>The Aesthetics Use for Buttonwood Brook (MA95-13) will continue to be assessed as Fully Supporting based on the general lack of objectionable conditions noted by MassDEP staff at the seven sites sampled in the summer of 2011.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1379	MassDEP	Water Quality	Buttonwood Brook	[Walter Fuller Memorial Parkway (downstream of Buttonwood Park Pond), New Bedford]	41.632064	-70.953597
W2325	MassDEP	Water Quality	Buttonwood Brook	[just upstream of northern perimeter fence for Buttonwood Zoo, New Bedford]	41.630991	-70.953251

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2326	MassDEP	Water Quality	Buttonwood Brook	[approximately 40 feet downstream of "concrete footbridge" in northern end of Buttonwood Zoo grounds, New Bedford]	41.630778	-70.952997
W2327	MassDEP	Water Quality	Buttonwood Brook	[immediately upstream of bison enclosure, Buttonwood Zoo, New Bedford]	41.629781	-70.952340
W2328	MassDEP	Water Quality	Buttonwood Brook	[at check dam within bison enclosure, Buttonwood Zoo, New Bedford]	41.629297	-70.952256
W2330	MassDEP	Water Quality	Buttonwood Brook	[just downstream of southern perimeter fence for Buttonwood Zoo, New Bedford]	41.629115	-70.952282
W2331	MassDEP	Water Quality	Buttonwood Brook	[at culvert entrance just upstream/east of Brownell Avenue, New Bedford]	41.627887	-70.953093

Aesthetic Observations

Aesthetics Summary Statements for MassDEP Stations (2011-2018) (MassDEP Undated6)

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W1379	Buttonwood Brook	2011	3	MassDEP aesthetics observations for station W1379 on Buttonwood Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2011.
W2325	Buttonwood Brook	2011	3	The Aesthetics use for Buttonwood Brook is assessed as Fully Supporting based on observations (generally no odors, deposits, or growths) by MassDEP staff during field surveys at station W2325 in summer 2011. However, the use is identified with an Alert status since the water was moderately turbid during all three visits.
W2326	Buttonwood Brook	2011	3	MassDEP aesthetics observations for station W2326 on Buttonwood Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2011.
W2327	Buttonwood Brook	2011	3	MassDEP aesthetics observations for station W2327 on Buttonwood Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2011.
W2328	Buttonwood Brook	2011	2	MassDEP aesthetics observations for station W2328 on Buttonwood Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2011. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2).
W2330	Buttonwood Brook	2011	2	MassDEP aesthetics observations for station W2330 on Buttonwood Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2011. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2).

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W2331	Buttonwood Brook	2011	3	MassDEP aesthetics observations for station W2331 on Buttonwood Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2011.

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W1379	2011	3	3	0
W2325	2011	3	3	0
W2326	2011	3	3	0
W2327	2011	3	2	0
W2328	2011	2	2	0
W2330	2011	2	2	0
W2331	2011	3	3	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W1379	Buttonwood Brook	2011	Color	Light Yellow/Tan	2	3
W1379	Buttonwood Brook	2011	Color	None	1	3
W1379	Buttonwood Brook	2011	Objectionable Deposits	Not Applicable (N/A)	3	3
W1379	Buttonwood Brook	2011	Odor	Musty (Basement)	3	3
W1379	Buttonwood Brook	2011	Scum	Not Applicable (N/A)	3	3
W1379	Buttonwood Brook	2011	Turbidity	Slightly Turbid	3	3
W2325	Buttonwood Brook	2011	Color	Light Yellow/Tan	2	3
W2325	Buttonwood Brook	2011	Color	None	1	3
W2325	Buttonwood Brook	2011	Objectionable Deposits	Not Applicable (N/A)	3	3
W2325	Buttonwood Brook	2011	Odor	Musty (Basement)	3	3
W2325	Buttonwood Brook	2011	Scum	Not Applicable (N/A)	3	3
W2325	Buttonwood Brook	2011	Turbidity	Moderately Turbid	3	3
W2326	Buttonwood Brook	2011	Color	Light Yellow/Tan	1	3
W2326	Buttonwood Brook	2011	Color	None	2	3
W2326	Buttonwood Brook	2011	Objectionable Deposits	Not Applicable (N/A)	3	3
W2326	Buttonwood Brook	2011	Odor	None	3	3
W2326	Buttonwood Brook	2011	Scum	Not Applicable (N/A)	3	3
W2326	Buttonwood Brook	2011	Turbidity	Slightly Turbid	3	3
W2327	Buttonwood Brook	2011	Color	Light Yellow/Tan	1	3
W2327	Buttonwood Brook	2011	Color	None	2	3
W2327	Buttonwood Brook	2011	Objectionable Deposits	Not Applicable (N/A)	3	3
W2327	Buttonwood Brook	2011	Odor	Musty (Basement)	1	3
W2327	Buttonwood Brook	2011	Odor	None	2	3
W2327	Buttonwood Brook	2011	Scum	Not Applicable (N/A)	3	3

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W2327	Buttonwood Brook	2011	Turbidity	Moderately Turbid	2	3
W2327	Buttonwood Brook	2011	Turbidity	Slightly Turbid	1	3
W2328	Buttonwood Brook	2011	Color	Light Yellow/Tan	1	2
W2328	Buttonwood Brook	2011	Color	None	1	2
W2328	Buttonwood Brook	2011	Objectionable Deposits	Not Applicable (N/A)	2	2
W2328	Buttonwood Brook	2011	Odor	Musty (Basement)	1	2
W2328	Buttonwood Brook	2011	Odor	Other	1	2
W2328	Buttonwood Brook	2011	Scum	Not Applicable (N/A)	2	2
W2328	Buttonwood Brook	2011	Turbidity	Moderately Turbid	2	2
W2330	Buttonwood Brook	2011	Color	Light Yellow/Tan	1	2
W2330	Buttonwood Brook	2011	Color	None	1	2
W2330	Buttonwood Brook	2011	Objectionable Deposits	Not Applicable (N/A)	2	2
W2330	Buttonwood Brook	2011	Odor	Musty (Basement)	1	2
W2330	Buttonwood Brook	2011	Odor	Other	1	2
W2330	Buttonwood Brook	2011	Scum	Not Applicable (N/A)	2	2
W2330	Buttonwood Brook	2011	Turbidity	Moderately Turbid	1	2
W2330	Buttonwood Brook	2011	Turbidity	Slightly Turbid	1	2
W2331	Buttonwood Brook	2011	Color	Light Yellow/Tan	1	3
W2331	Buttonwood Brook	2011	Color	None	2	3
W2331	Buttonwood Brook	2011	Objectionable Deposits	Not Applicable (N/A)	3	3
W2331	Buttonwood Brook	2011	Odor	Musty (Basement)	1	3
W2331	Buttonwood Brook	2011	Odor	None	2	3
W2331	Buttonwood Brook	2011	Scum	Not Applicable (N/A)	3	3
W2331	Buttonwood Brook	2011	Turbidity	Moderately Turbid	2	3
W2331	Buttonwood Brook	2011	Turbidity	Slightly Turbid	1	3

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff collected <i>E. coli</i> bacteria samples at seven sites along Buttonwood Brook (MA95-13) in New Bedford, during the summer of 2011 as part of the BST project, from upstream to downstream as follows: on Walter Fuller Memorial Parkway (downstream of Buttonwood Park Pond) (W1379, n=3), just upstream of the northern perimeter fence for Buttonwood Zoo (W2325, n=3), ~40 ft downstream of "concrete footbridge" in northern end of Buttonwood Zoo grounds (W2326, n=3), immediately upstream of bison enclosure in Buttonwood Zoo (W2327, n=3), at the check dam within the bison enclosure in Buttonwood Zoo (W2328, n=2), just downstream of the southern perimeter fence for Buttonwood Zoo (W2330, n=2), and furthest downstream at the culvert entrance just upstream/east of Brownell Ave (W2331, n=3). Too few samples were collected to evaluate these single-year, low frequency datasets according to the CALM "Use Attainment Impairment Decision Schema" (i.e., 3 samples within a 90-day interval). The seasonal geomeans were 23, 343, 333, 72, 7651, 2065, and 619 cfu/100 ml from upstream to downstream, respectively.</p> <p>Too limited recent <i>E. coli</i> data are available to assess the Primary Contact Recreational Use for Buttonwood Brook (MA95-13) so it will continue to be assessed as Not Supporting with the <i>Enterococcus</i>, <i>E. coli</i>, and Fecal Coliform impairments all being carried forward.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1379	MassDEP	Water Quality	Buttonwood Brook	[Walter Fuller Memorial Parkway (downstream of Buttonwood Park Pond), New Bedford]	41.632064	-70.953597
W2325	MassDEP	Water Quality	Buttonwood Brook	[just upstream of northern perimeter fence for Buttonwood Zoo, New Bedford]	41.630991	-70.953251
W2326	MassDEP	Water Quality	Buttonwood Brook	[approximately 40 feet downstream of "concrete footbridge" in northern end of Buttonwood Zoo grounds, New Bedford]	41.630778	-70.952997
W2327	MassDEP	Water Quality	Buttonwood Brook	[immediately upstream of bison enclosure, Buttonwood Zoo, New Bedford]	41.629781	-70.952340
W2328	MassDEP	Water Quality	Buttonwood Brook	[at check dam within bison enclosure, Buttonwood Zoo, New Bedford]	41.629297	-70.952256
W2330	MassDEP	Water Quality	Buttonwood Brook	[just downstream of southern perimeter fence for Buttonwood Zoo, New Bedford]	41.629115	-70.952282
W2331	MassDEP	Water Quality	Buttonwood Brook	[at culvert entrance just upstream/east of Brownell Avenue, New Bedford]	41.627887	-70.953093

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP

Undated11) (MassDEP Undated6)

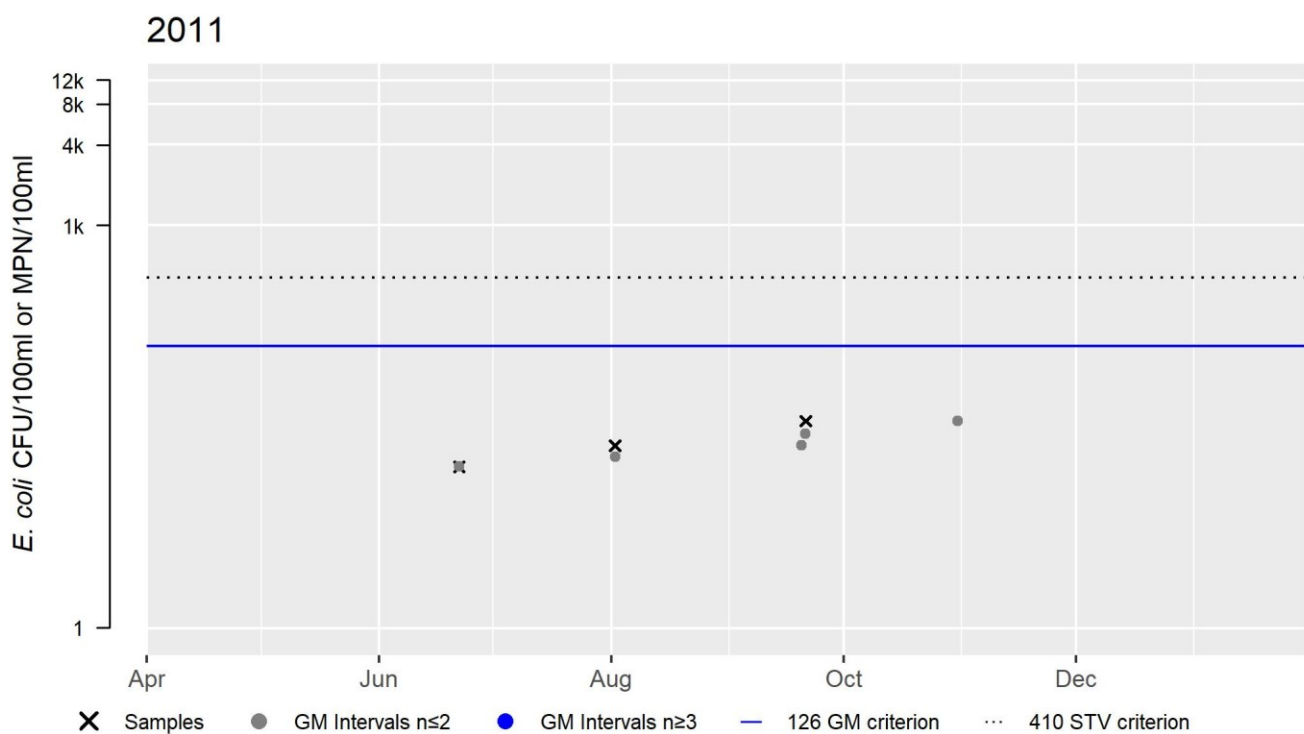
[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
W1379	MassDEP	E. coli	06/22/11	09/21/11	3	16	35	23
W2325	MassDEP	E. coli	06/22/11	09/21/11	3	147	1410	343
W2326	MassDEP	E. coli	06/22/11	09/21/11	3	131	770	333
W2327	MassDEP	E. coli	06/22/11	09/21/11	3	60	79	72
W2328	MassDEP	E. coli	08/02/11	09/21/11	2	2419.6	24196	7651
W2330	MassDEP	E. coli	06/22/11	09/21/11	2	1720	2480	2065
W2331	MassDEP	E. coli	06/22/11	09/21/11	3	219	2419.6	619

W1379 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	23
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

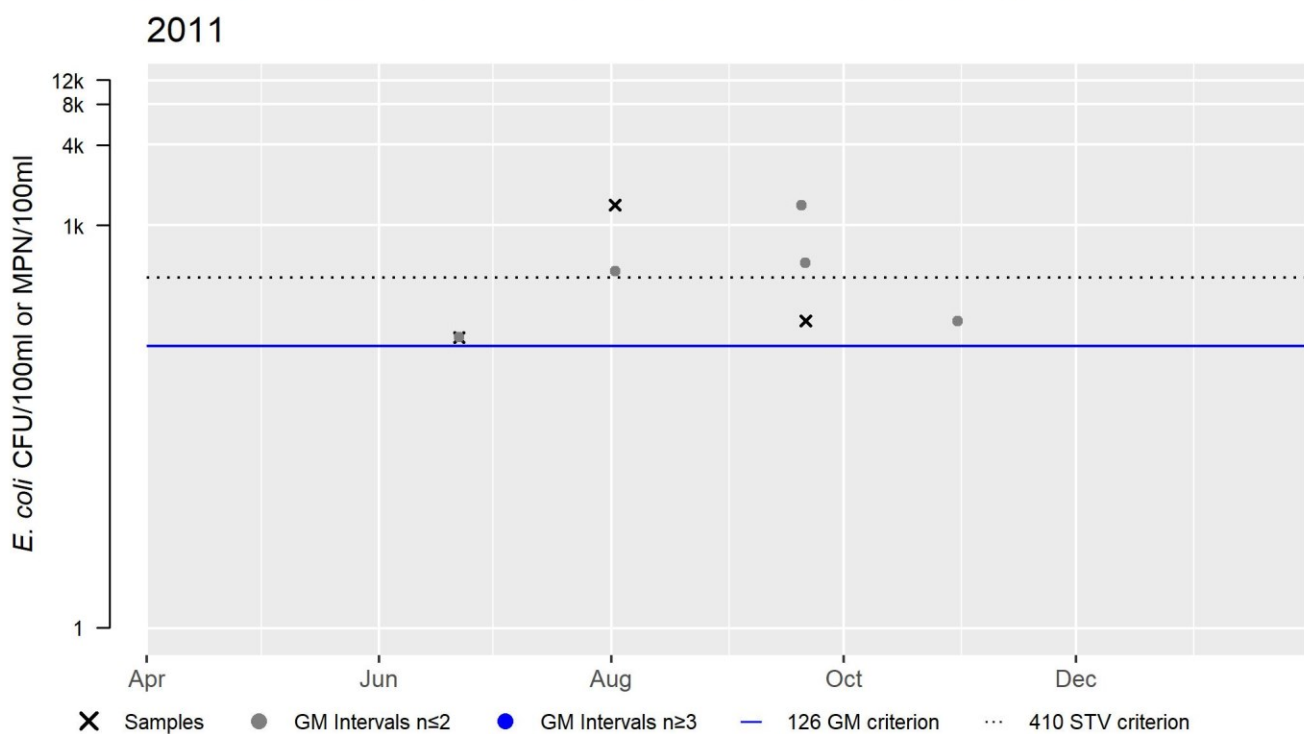
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2325 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	343
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	33

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

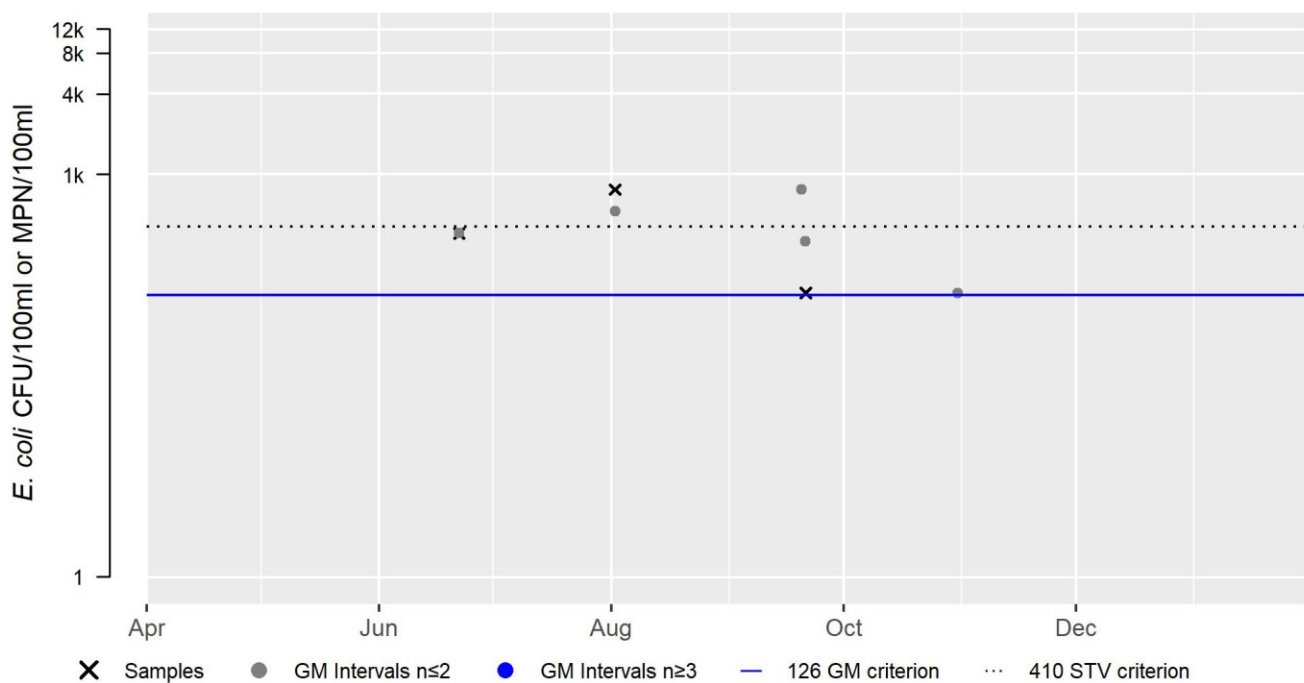


W2326 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	333
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	33

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

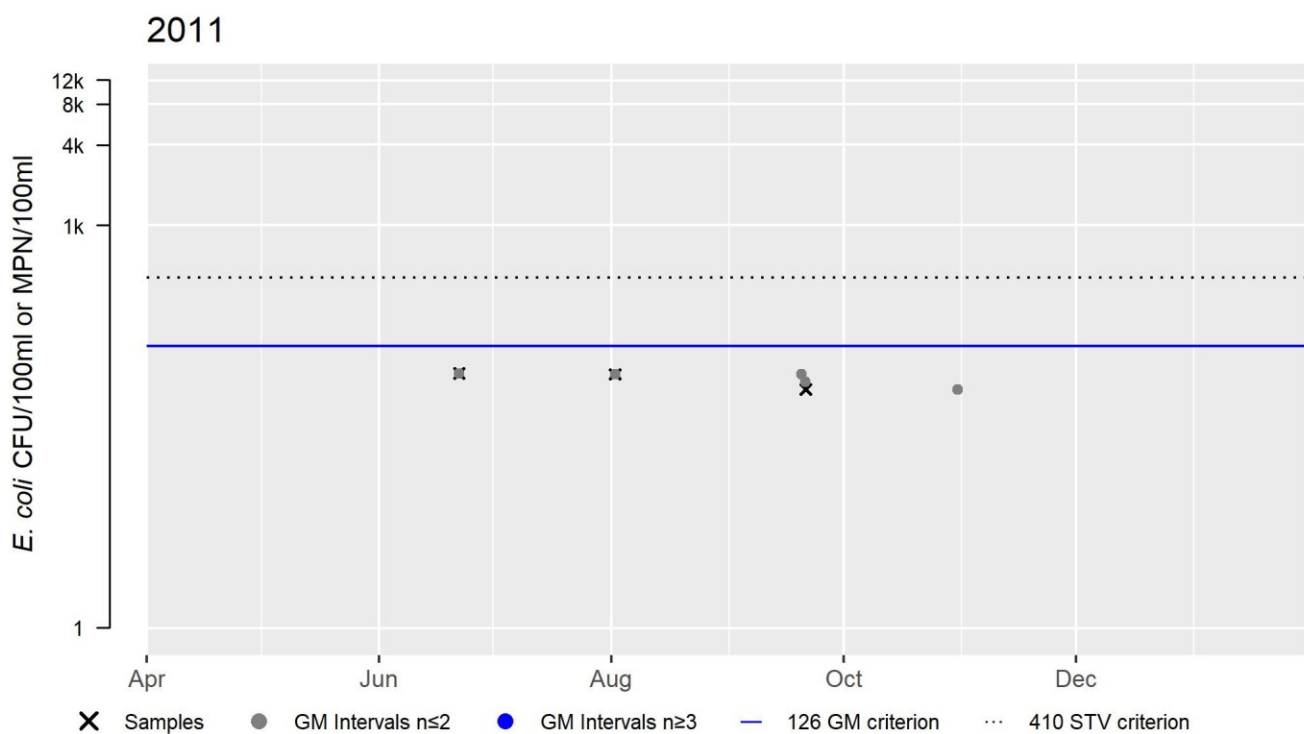
2011



W2327 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	72
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

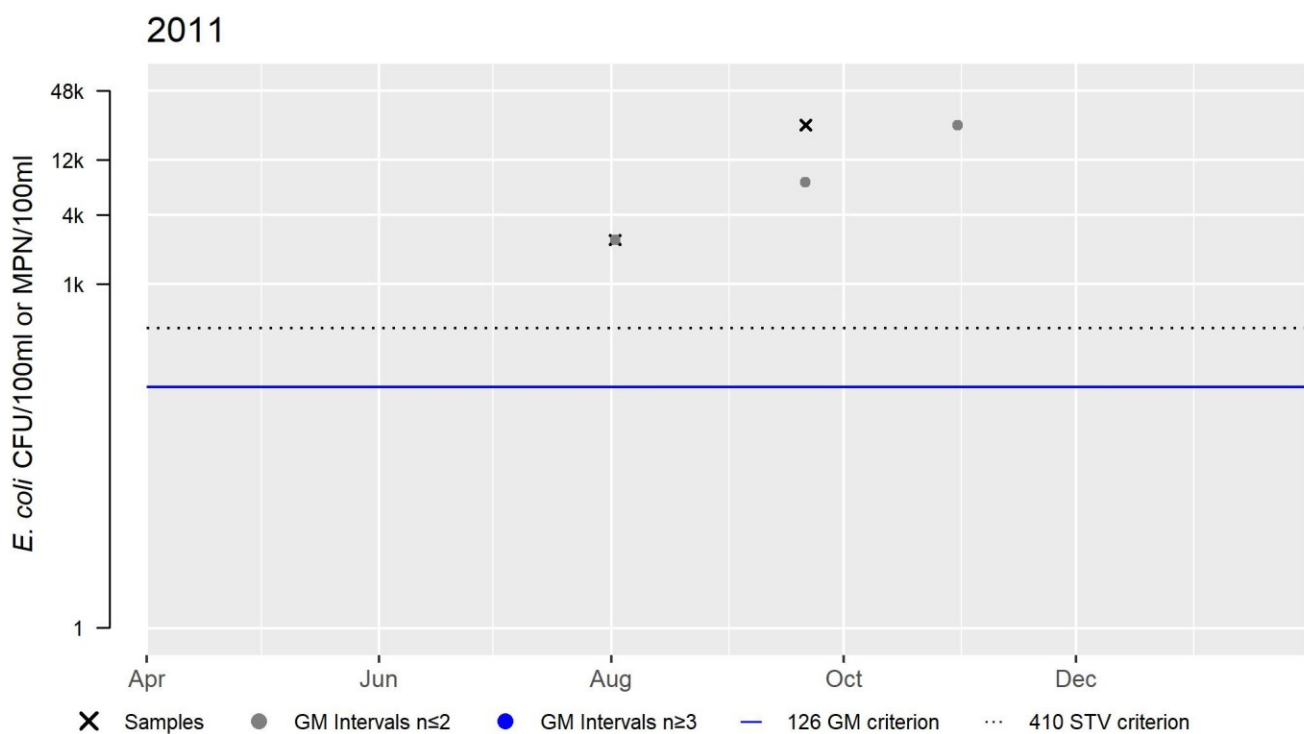
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2328 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	7651
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	2
%n>STV	100

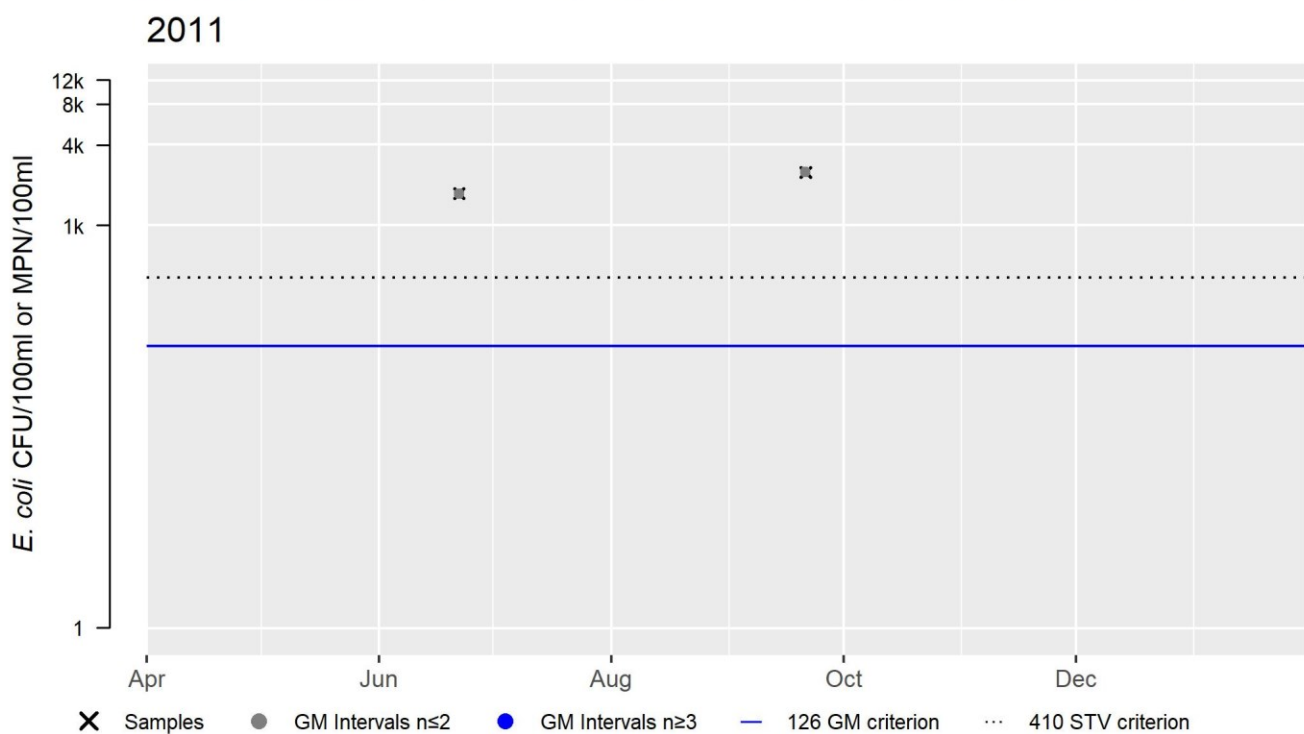
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2330 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	2065
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	2
%n>STV	100

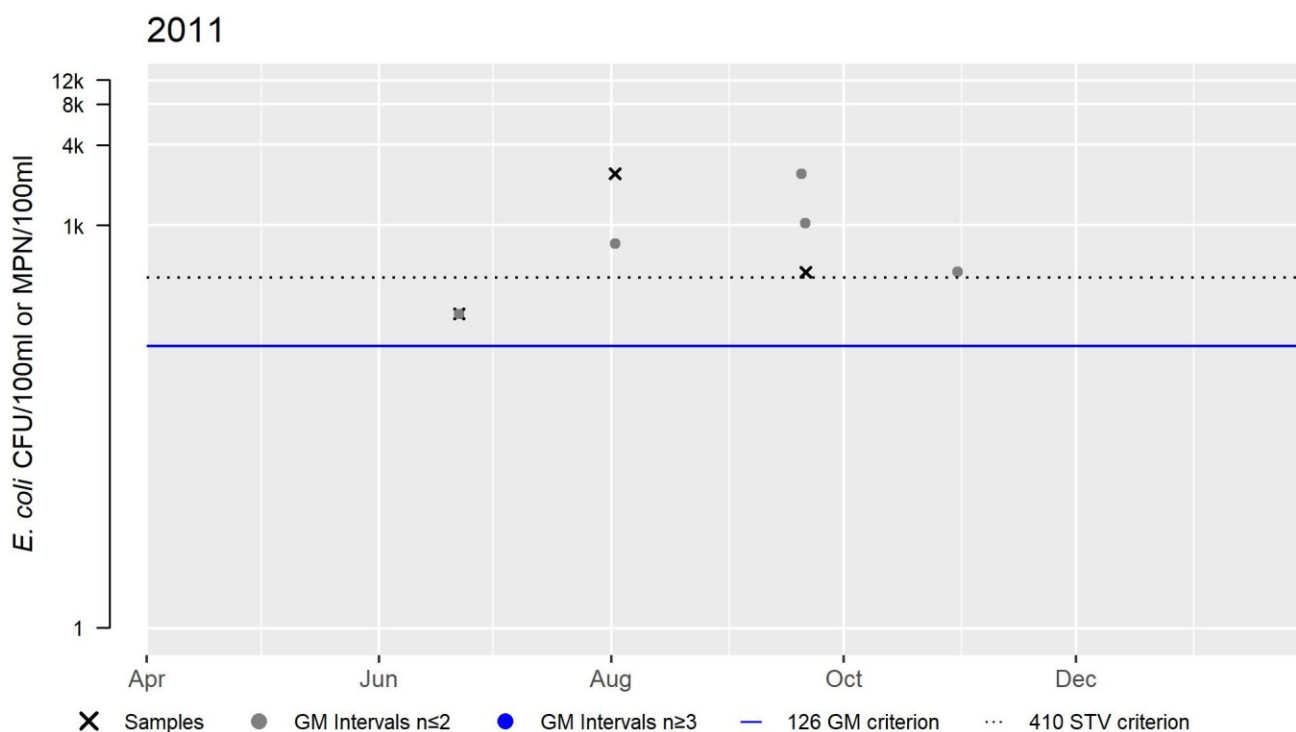
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2331 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	619
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	2
%n>STV	67

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019 (MassDEP Undated2)

Summary

Prior to 2011, BST work was conducted at 13 sites on the Buttonwood Brook AU (MA95-13), most located in and around the middle of the AU, with a max *E. coli* concentration of 155,310 MPN, noted during wet weather conditions. Additional BST work was conducted at 12 sites on the brook in 2011, with *E. coli* concentrations ranging 16 to 24,196 MPN (covers both dry and wet weather conditions). The Buttonwood Park Zoo actively assisted and supported the BST sampling effort in and around the zoo property; they are also actively investigating and trialing ways to minimize their contribution to non-point source runoff in the watershed. The pond just upstream of the Walter E. Fuller Memorial Pkwy was observed to be a source of bacteria to the watershed, with its large population of waterfowl. No human sources were found in the AU, including a neighborhood upstream of Rt.140 which was ruled out.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff collected <i>E. coli</i> bacteria samples at seven sites along Buttonwood Brook (MA95-13) in New Bedford, during the summer of 2011 as part of the BST project, from upstream to downstream as follows: on Walter Fuller Memorial Parkway (downstream of Buttonwood Park Pond) (W1379, n=3), just upstream of the northern perimeter fence for Buttonwood Zoo (W2325, n=3), ~40 ft downstream of "concrete footbridge" in northern end of Buttonwood Zoo grounds (W2326, n=3), immediately upstream of bison enclosure in Buttonwood Zoo (W2327, n=3), at the check dam within the bison enclosure in Buttonwood Zoo (W2328, n=2), just downstream of the southern perimeter fence for Buttonwood Zoo (W2330, n=2), and furthest downstream at the culvert entrance just upstream/east of Brownell Ave (W2331, n=3). Too few samples were collected to evaluate these single-year, low frequency datasets according to the CALM "Use Attainment Impairment Decision Schema" (i.e., 3 samples within a 90-day interval). The seasonal geometric means were 23, 343, 333, 72, 7651, 2065, and 619 cfu/100 ml from upstream to downstream, respectively.</p> <p>Too limited recent <i>E. coli</i> data are available to assess the Secondary Contact Recreational Use for Buttonwood Brook (MA95-13) so it will continue to be assessed as Not Supporting with the <i>Enterococcus</i> impairment being carried forward.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1379	MassDEP	Water Quality	Buttonwood Brook	[Walter Fuller Memorial Parkway (downstream of Buttonwood Park Pond), New Bedford]	41.632064	-70.953597
W2325	MassDEP	Water Quality	Buttonwood Brook	[just upstream of northern perimeter fence for Buttonwood Zoo, New Bedford]	41.630991	-70.953251
W2326	MassDEP	Water Quality	Buttonwood Brook	[approximately 40 feet downstream of "concrete footbridge" in northern end of Buttonwood Zoo grounds, New Bedford]	41.630778	-70.952997
W2327	MassDEP	Water Quality	Buttonwood Brook	[immediately upstream of bison enclosure, Buttonwood Zoo, New Bedford]	41.629781	-70.952340
W2328	MassDEP	Water Quality	Buttonwood Brook	[at check dam within bison enclosure, Buttonwood Zoo, New Bedford]	41.629297	-70.952256
W2330	MassDEP	Water Quality	Buttonwood Brook	[just downstream of southern perimeter fence for Buttonwood Zoo, New Bedford]	41.629115	-70.952282
W2331	MassDEP	Water Quality	Buttonwood Brook	[at culvert entrance just upstream/east of Brownell Avenue, New Bedford]	41.627887	-70.953093

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP Undated11) (MassDEP Undated6)

[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
W1379	MassDEP	E. coli	06/22/11	09/21/11	3	16	35	23
W2325	MassDEP	E. coli	06/22/11	09/21/11	3	147	1410	343
W2326	MassDEP	E. coli	06/22/11	09/21/11	3	131	770	333
W2327	MassDEP	E. coli	06/22/11	09/21/11	3	60	79	72
W2328	MassDEP	E. coli	08/02/11	09/21/11	2	2419.6	24196	7651
W2330	MassDEP	E. coli	06/22/11	09/21/11	2	1720	2480	2065

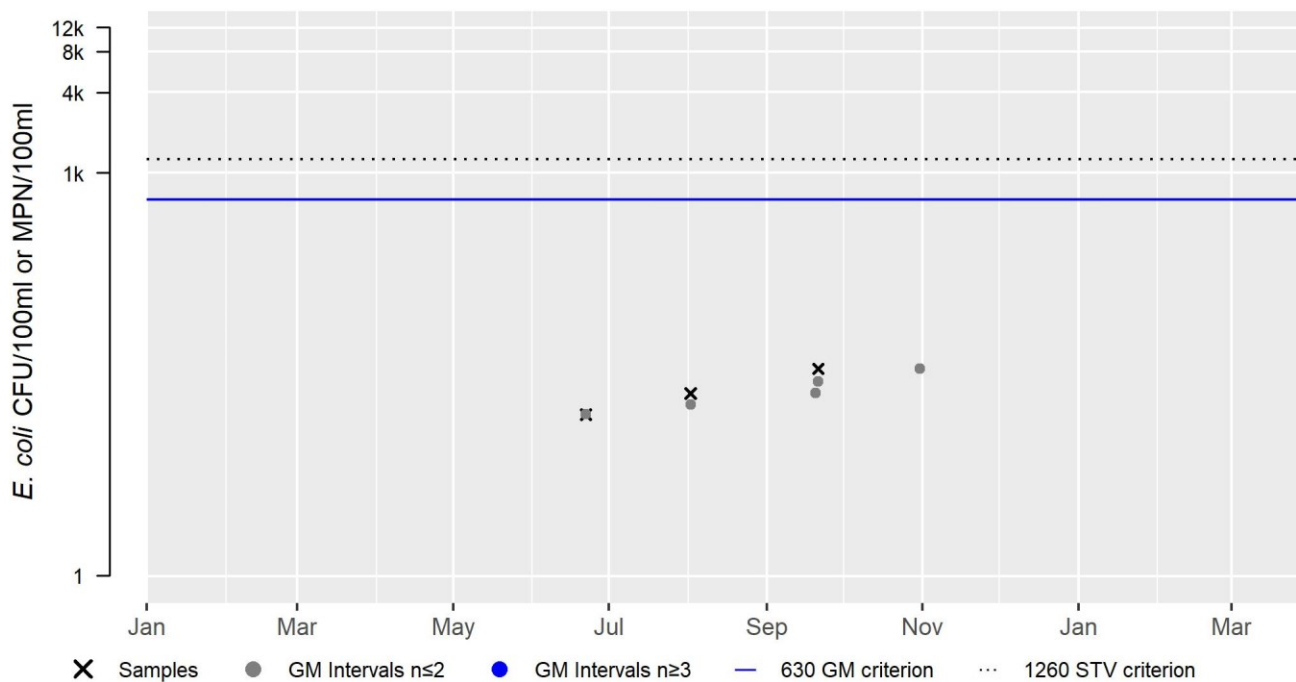
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
W2331	MassDEP	E. coli	06/22/11	09/21/11	3	219	2419.6	619

W1379 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	23
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

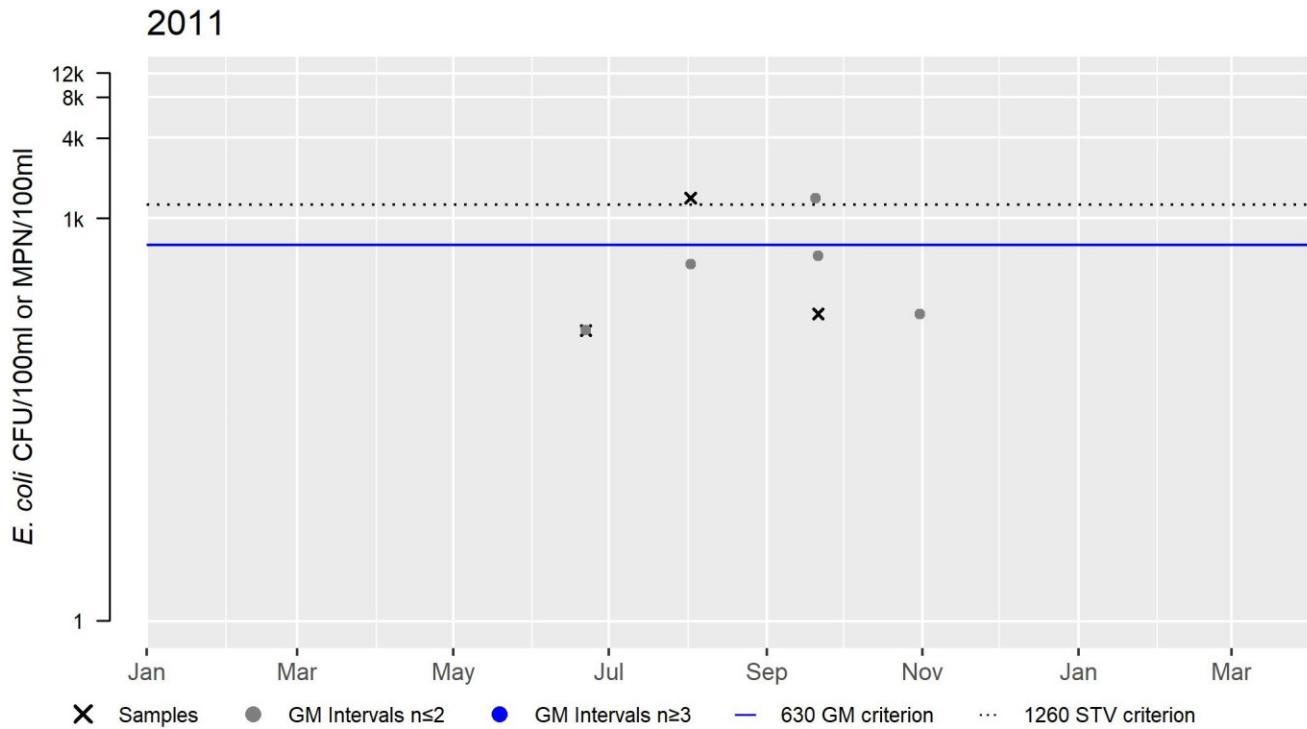
2011



W2325 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	343
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	33

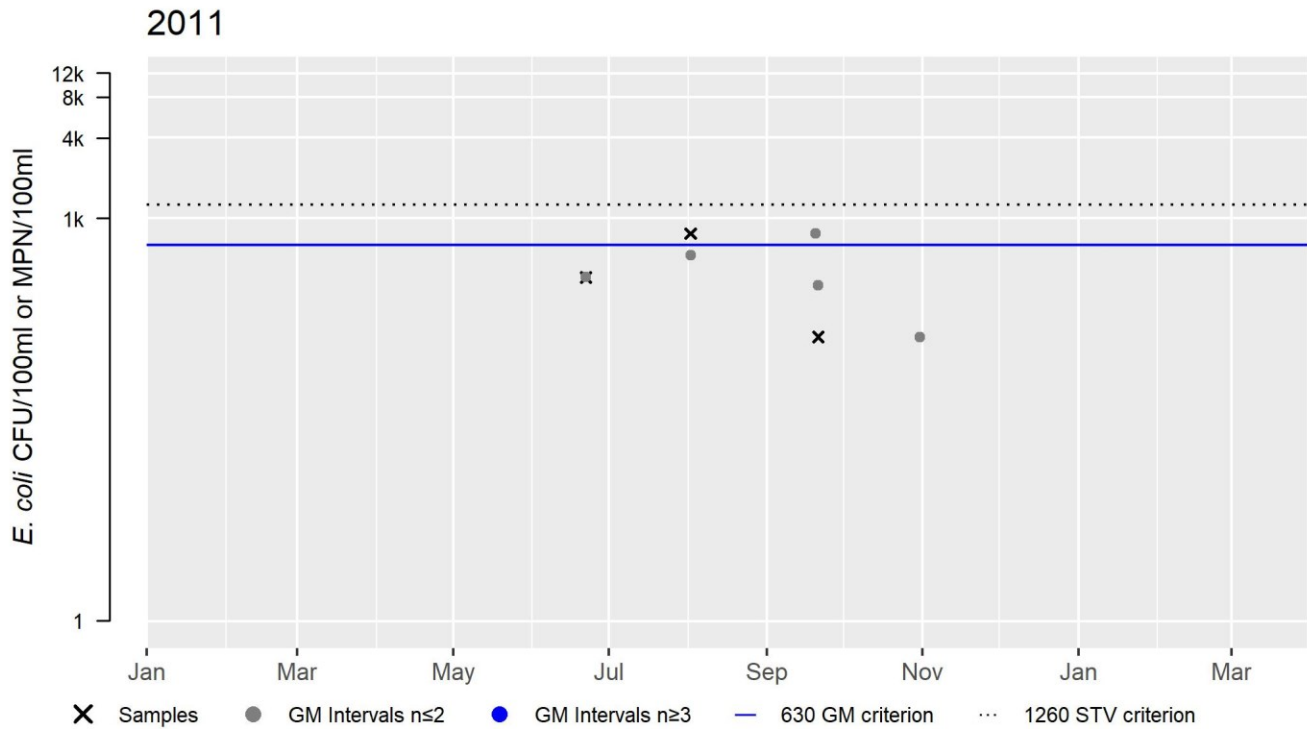
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2326 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	333
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

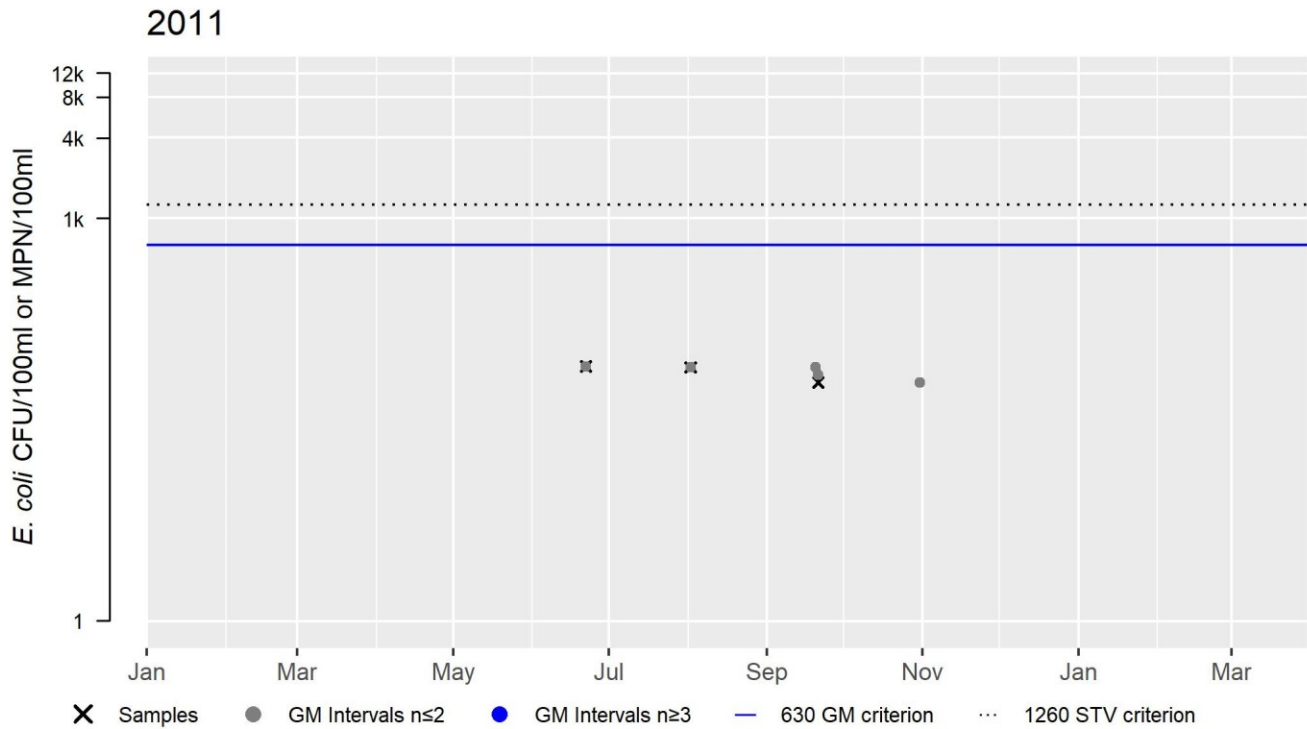
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2327 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	72
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

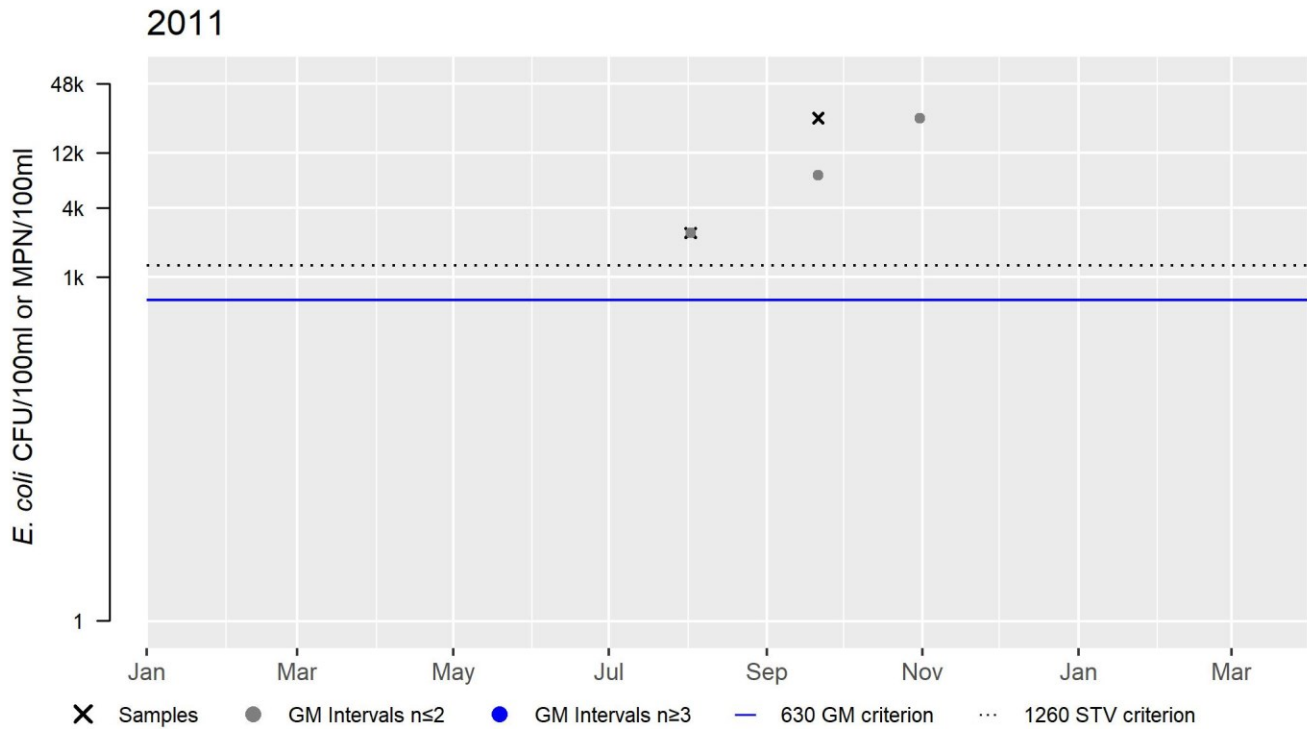
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2328 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	7651
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	2
%n>STV	100

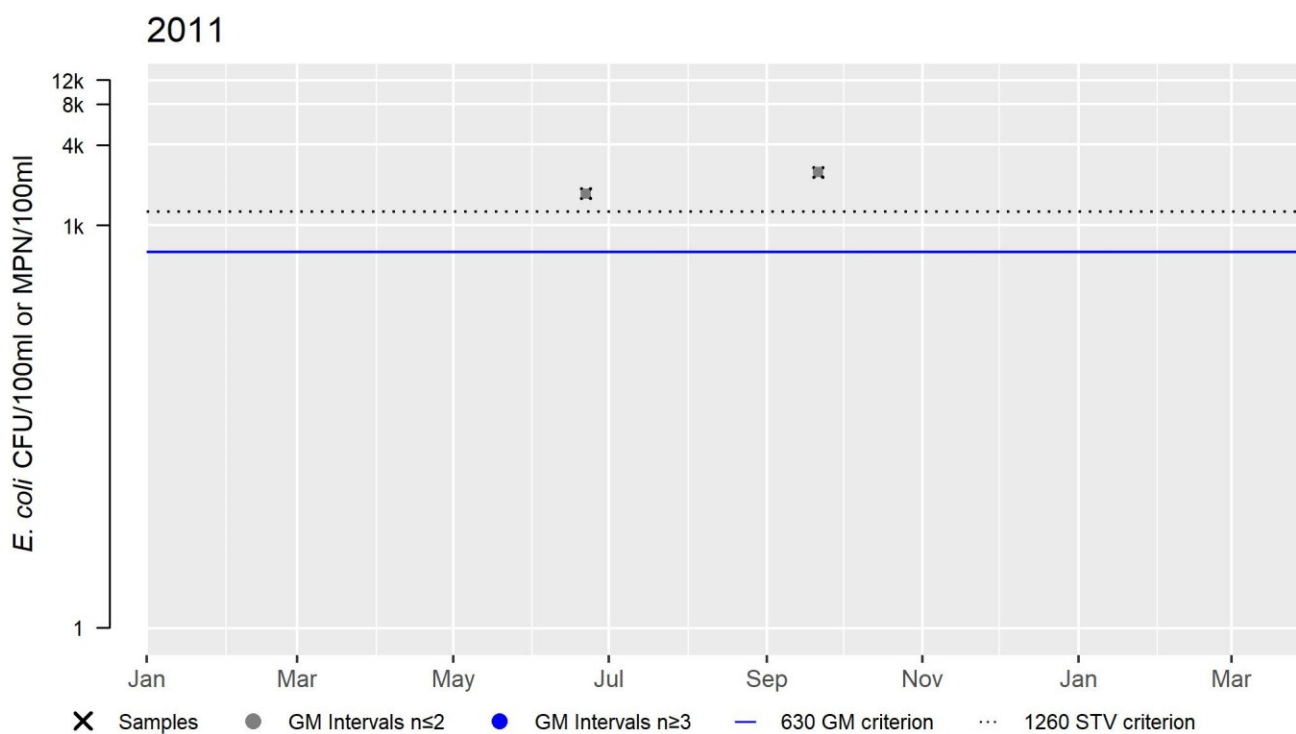
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2330 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	2065
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	2
%n>STV	100

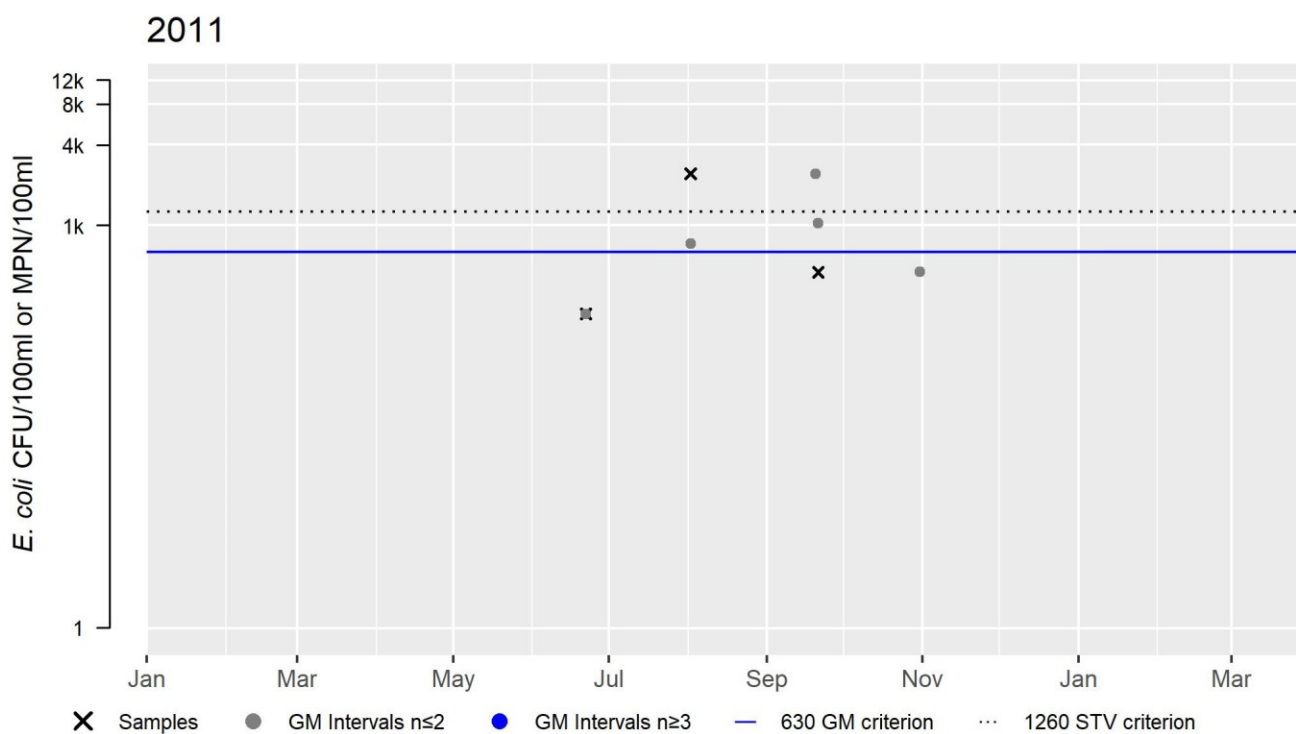
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2331 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	619
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	33

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



Buttonwood Park Pond (MA95020)

Location:	New Bedford.
AU Type:	FRESHWATER LAKE
AU Size:	12 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	
DMF biologists note one structure causing passage limitation to diadromous fish at the downstream end of Buttonwood Park Pond. The Buttonwood Park Dam (NATID# MA03067) was given a passage score of "10", on a 0-10 scale, indicating that the dam allows no possible passage of the targeted species, river herring and American eel, between Buttonwood Park Pond and the AU downstream (Buttonwood Brook MA95-13). However, the population score in this area was noted to be "0". DMF visited the area in 2020 and noted that there was limited water quality, quantity, and spawning habitat. Too limited data are available to assess the Aquatic Life Use for Buttonwood Park Pond (MA95020) so it is assessed as having Insufficient Information. The previously identified Alert (because of a DPH algal bloom posting for 15 days in 2011) applied to this use was in error, so it is being removed.	

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note one structure causing passage limitation to diadromous fish at the downstream end of this AU. The Buttonwood Park Dam (NATID# MA03067) was given a passage score of "10", on a 0-10 scale, indicating that the dam allows no possible passage of the targeted species, river herring and American eel, between Buttonwood Park Pond and the AU downstream (Buttonwood Brook MA95-13). The population score was noted to be "0". DMF visited the area in 2020 and noted that there was limited water quality, quantity and spawning habitat. The Aquatic Life Use for Buttonwood Park Pond (Assessment Unit MA95020) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Buttonwood Park Dam.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Buttonwood Park Pond (MA95020); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Buttonwood Park Pond (MA95020) so it is Not Assessed. The Alert identified because of a DPH algal bloom posting for 15 days in 2011, is being carried forward.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for Buttonwood Park Pond (MA95020) so it is Not Assessed. The Alert identified because of a DPH algal bloom posting for 15 days in 2011, is being carried forward.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Buttonwood Park Pond (MA95020) so it is Not Assessed. The Alert identified because of a DPH algal bloom posting for 15 days in 2011, is being carried forward.	

Buzzards Bay (MA95-62)

Location:	Open water area encompassed within a line drawn from Wilber Point, Fairhaven to Clarks Point, New Bedford to Ricketson Point, Dartmouth to vicinity of Samoset Street, Dartmouth down to Round Hill Point, Dartmouth and back to Wilber Point, Fairhaven.
AU Type:	ESTUARY
AU Size:	8.07 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Estuarine Bioassessments		Added
5	5	Fecal Coliform	36172	Unchanged
5	5	PCBs in Fish Tissue		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
PCBs in Fish Tissue	CERCLA NPL (Superfund) Sites (Y)		X				
PCBs in Fish Tissue	Contaminated Sediments (Y)		X				

Recommendations

2022 Recommendations
ALU: Conduct additional monitoring to evaluate nutrient enrichment stress including primary producer biological screening (chlorophyll <i>a</i> as well as continuous DO measurements at one or two buoy sites if possible) as well as total nitrogen sampling (at least three times per season at mid-ebb tide) for this Buzzards Bay AU (MA95-62).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an ~32% loss of eelgrass bed habitat in Buzzards Bay between 1995 and 2017 (a decrease from 0.17 to 0.12mi²). Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at one location in the southwest corner of Buzzards Bay, Dartmouth (MA95-62) in the summers of 2015 and 2016, just off the coast from Round Hill (BBC_RDH1). Monitoring was conducted in the surface waters as well as deeper in the water column (depths ranged 0.6-0.7m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 25.0°C (n=43). The minimum dissolved oxygen (DO) was 5.0mg/L (n=43), frequently (~35% overall) measuring <6.0mg/L at all depths. It is noted however, that the monitoring location is very close to shore and does not well represent the water quality conditions of this Buzzards Bay AU area. The only Secchi disk depth was taken 0.6m in June 2015. Between September 2015 and December 2019 whole effluent toxicity tests were conducted on the New Bedford WWTF effluent using the test organisms *M. beryllina* and *M. bahia* (for acute WET tests only) (n=18 tests for *M. beryllina* and n=17 tests for *M. bahia*). There was no evidence of acute toxicity to either test species (all LC50s were >100% effluent). The CNOEC results ranged from 25 to 100% effluent and all chronic tests met the CNOEC limit of ≥12.5% effluent (n=15 tests). Results of the chronic *Arbacia punctulata* fertilization tests also met the permit limit (all CNOEC results 100% effluent).

The Aquatic Life Use for Buzzards Bay (MA95-62) is assessed as Not Supporting based on the loss of eelgrass bed habitat documented by the MassDEP Eelgrass Mapping Project between 1995 and 2017. An impairment for Estuarine Bioassessments is being added. An Alert is being identified due to slightly low DO reported by BBC staff/volunteers off the coast of Round Hill in summers 2015 and 2016. A recommendation is being made to collect additional data at representative monitoring locations to better evaluate the Aquatic Life Use and any nutrient related stress in this Buzzards Bay AU area(MA95-62).

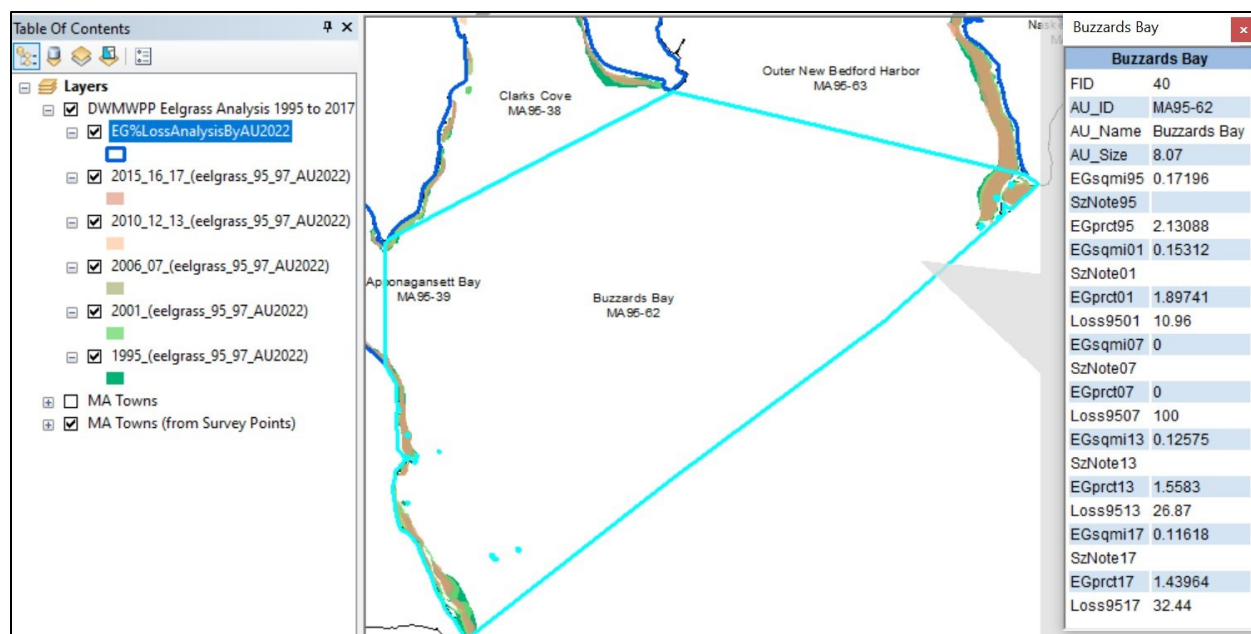
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_RDH1	Buzzards Bay Coalition	Water Quality	Round Hill	Round Hill, Dartmouth	41.542772	-70.930947

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Buzzards Bay MA95-62 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~32% loss of eelgrass bed habitat in Buzzards Bay between 1995 and 2017.

Toxicological Monitoring Information (Ambient, Effluent, Sediment)

New Bedford WWTF [MA95-62] Whole Effluent Toxicity information summary. (MassDEP Undated9)

Effluent

A total of 15 valid modified acute and chronic whole effluent toxicity tests were conducted on the New Bedford WWTF treated effluent (NPDES MA0100781, outfall #001) using *M. beryllina* and 17 acute tests using *M. bahia* between September 2015 and December 2019. There was no evidence of acute toxicity to either test species (all LC50s were >100% effluent (n=there were actually 18 valid acute tests for *M. beryllina* using the first 48 hours of the chronic tests, and n=17 valid acute tests for *M. bahia*). The *M. beryllina* CNOEC results ranged from 25 to 100% effluent and all chronic tests met the CNOEC limit of $\geq 12.5\%$ effluent (n=15 valid tests). Results of the chronic *Arbacia punctulata* fertilization tests also met the permit limit (all CNOEC results 100% effluent).

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_RDH1	06/10/15	08/04/15	0.1	6	5.0	6.1	33	0	0
BBC_RDH1	05/28/15	09/19/15	0.6	17	5.0	6.1	29	0	0
BBC_RDH1	07/11/16	08/25/16	0.2	4	5.5	5.6	75	0	0
BBC_RDH1	05/31/16	09/20/16	0.7	16	5.0	6.2	31	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_RDH1	06/10/15	08/04/15	0.1	6	6	24.0	20.7	0
BBC_RDH1	05/28/15	09/19/15	0.6	17	15	24.0	22.3	0
BBC_RDH1	07/11/16	08/25/16	0.2	4	4	25.0	24.0	0
BBC_RDH1	05/31/16	09/20/16	0.7	16	13	25.0	21.5	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

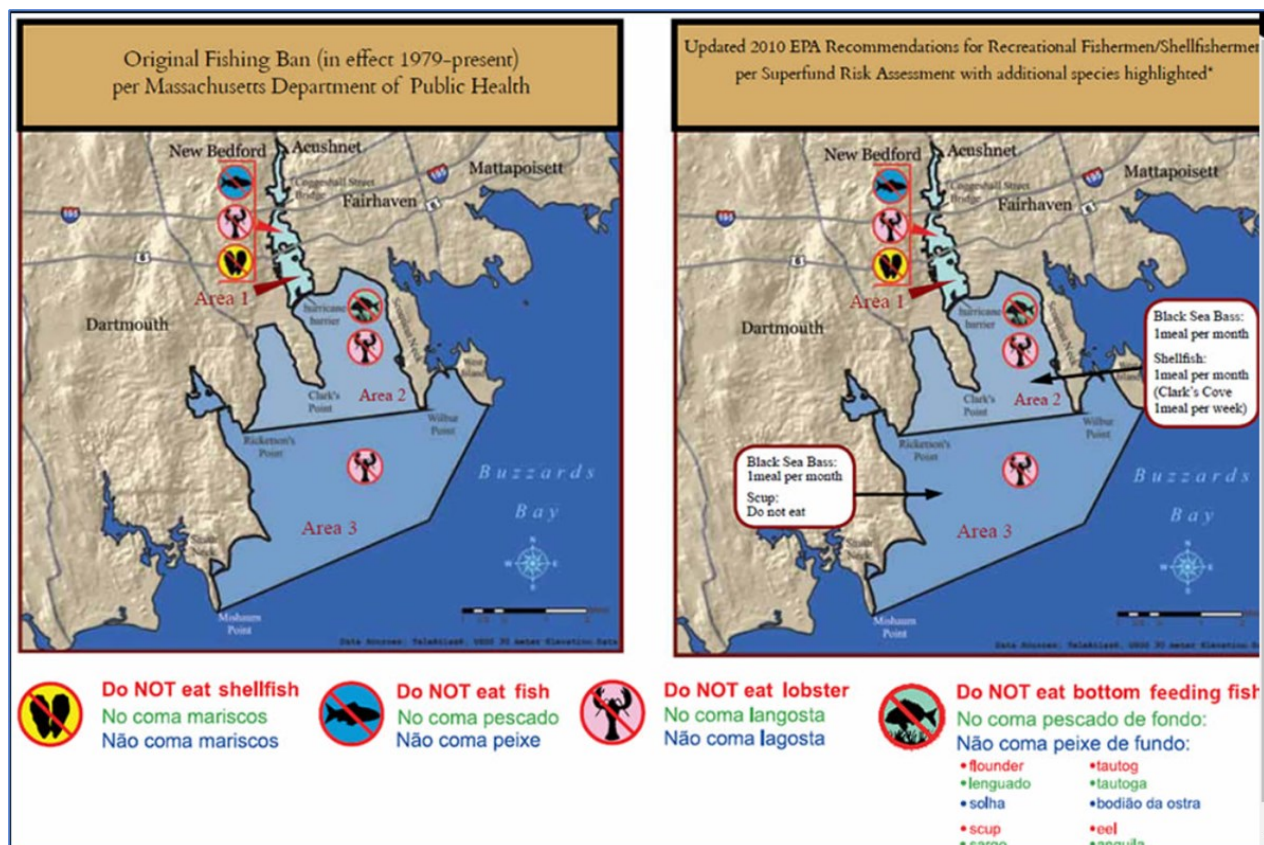
Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_RDH1	06/16/15	06/16/15	1	0.6	0.6	0.6

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
The Fish Consumption Use for this Buzzards Bay AU area (MA95-62) will continue to be assessed as Not Supporting with the PCBs in Fish Tissue impairment being carried forward. EPA and MA DPH recommend the public not eat lobster, nor specific bottom feeding fish (flounder, tautog, scup, or eel), and should limited consumption of black sea bass and shellfish to one meal per month public in Area 2 (includes a portion of this Buzzards Bay AU) and in Area 3 (which encompasses the remaining outer area of this Buzzards Bay AU)—The general public should not eat lobster or scup from this area and black sea bass should be limited to one meal per month because of PCB contamination.	

New Bedford Harbor Fish Consumption Regulations and Recommendations (EPA 2022)



Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>Buzzards Bay (MA95-62): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 8.0565 sq mi (100%). The approved shellfish growing area represents 4.321 sq mi (54%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.</p>	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB11.0	Dartmouth East Coastal, Approved	Approved	3.66181	45.4%
BB11.2	Dartmouth East Coastal North	Prohibited	0.57930	7.2%
BB11.3	Dartmouth East Coastal South	Conditionally Approved	0.60179	7.5%
BB13.2	Clarks Cove, Southwest (The Pie)	Conditionally Approved	0.00000	0.0%
BB14.0	New Bedford East Coast	Approved	0.65923	8.2%
BB14.2	New Bedford East Coastal (WWTP)	Prohibited	1.03315	12.8%
BB14.3	New Bedford East Coastal	Conditionally Approved	1.52121	18.8%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Buzzards Bay (MA95-62) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>The Nonquitt beach (ID 2738) in Dartmouth was never posted for swimming between 2014 and 2019.</p> <p>The Primary Contact Recreational Use for Buzzards Bay (MA95-62) is assessed as Fully Supporting since there were no swimming advisory postings at Nonquitt Beach between 2014 and 2019.</p>	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2738	Nonquitt/Dartmouth	41.55648	-70.93540	41.56100	-70.93660	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
<p>Buzzards Bay (MA95-62): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 8.0565 sq mi (100%). The approved shellfish growing area represents 4.321 sq mi (54%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.</p>

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>The Nonquitt beach (ID 2738) in Dartmouth was never posted for swimming between 2014 and 2019.</p> <p>The Secondary Contact Recreational Use for Buzzards Bay (MA95-62) is assessed as Fully Supporting since there were no swimming advisory postings at Nonquitt Beach between 2014 and 2019.</p>	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary

Buzzards Bay (MA95-62): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 8.0565 sq mi (100%). The approved shellfish growing area represents 4.321 sq mi (54%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Cape Cod Canal (MA95-14)

Location:	Waterway between Buzzards Bay and Cape Cod Bay, Bourne/Sandwich.
AU Type:	ESTUARY
AU Size:	1.17 SQUARE MILES
Classification/Qualifier:	SB: SFR

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Fecal Coliform	36171	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			

Recommendations

2022 Recommendations
ALU: A new permit must be issued for the Canal Generating Plant with appropriate monitoring and limits in place including a plan to minimize entrainment/impingement of fish (and ensure their safe return away from intake screens and thermal discharges) and thermal impacts to the aquatic life in Cape Cod Canal (MA95-14).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at two locations at the west end of the Cape Cod Canal, Bourne (MA95-14) in the summers of 2018 and 2019 (BBC_MMA7 and BBC_MMA6). Both stations were close to the north shore (land side) of the canal. Monitoring was conducted in the surface waters at both locations, as well as deeper in the water column (at average depths ranging from 5.7 to 8.0m) and was usually conducted weekly (between the hours of 6 & 9am). The maximum temperature was 21°C (n=32) and the minimum dissolved oxygen (DO) was 6.4mg/L (n=64). Total nitrogen sampling (n=41, maximum of 0.34mg/L) during ebb tides in September and October 2018 and May through October 2019 documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.23-0.24mg/L. Chlorophyll a concentrations were usually low (maximum 7.54µg/L; >5µg/L only eight times, n=64). Secchi disk depths ranged from 3.3 to 5.8m (n=10). Ammonia-nitrogen concentrations were low (range 0.004 to 0.05mg/L, n=64), however TUs for ammonia-nitrogen could not be calculated (lack of quality assured pH and salinity data). Water from the west end of Cape Cod Canal was collected for use as site control in Mass Maritime Academy's (MA0024368) whole effluent toxicity (WET) tests. Survival of *M. bahia* exposed (48-hours) to the canal water was excellent (100%) (n=6 tests between June 2016 and July 2021). Five valid tests were conducted on outfall 001 between June 2016 and July 2021 using *M. bahia*; except for the June 2019 test, no acute WET was detected. For the June test the LC50 was also >100% effluent, though the ANOEC result was 50% effluent. At the east end of the Cape Cod Canal, the Canal Generating Plant (currently owned by "GenOn Holdco 10, LLC"), a 1120 megawatt (MW) fossil fuel electrical generation facility, operates a once-through cooling water system. The Station has two cooling water intake structures and the heated steam turbine condenser wastewater is discharged (~518 MGD) to the Cape Cod Canal through a diffuser. The potential impacts from this operation are undetermined at this time. Currently the NPDES permit issued to Canal Station in 1989 remains in effect since the 2008 NPDES permit limits were appealed and EPA withdrew and re-noticed it for Public Comment. The Final Permit (August-2008) has not yet gone into effect pending the resolution of the appeal. The Aquatic Life Use for Cape Cod Canal (MA95-14) is assessed as Fully Supporting based on good survival of test organisms exposed to canal water and on the generally good water quality documented by the BBC at the west end of the AU in 2018-2019. The Alert for the potential impacts (i.e., impingement/entrainment, fish return, and thermal) associated with the Canal Generating Plant is being carried forward. The facility is currently running on a permit issued in 1989, so no changes having been made to address these potential issues.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_MMA6	Buzzards Bay Coalition	Water Quality	Upper Buzzards Bay	Upper Buzzards Bay, Bourne	41.739328	-70.622081
BBC_MMA7	Buzzards Bay Coalition	Water Quality	Upper Buzzards Bay	Upper Buzzards Bay, Bourne	41.742015	-70.615257

Toxicological Monitoring Information (Ambient, Effluent, Sediment)

Mass Maritime Academy [MA95-14] Whole Effluent Toxicity and ambient testing information summary. (MassDEP Undated9)

The Mass Maritime Academy is permitted (MA0024368 issued February 2011) to discharge an average monthly flow of 0.077MGD of treated effluent and boiler blowdown via outfall #001 to the Cape Cod Canal/Buzzards Bay. The facility is required to conduct an acute whole effluent toxicity test using *M. bahia* as the test species in June of each year with an LC 50 >50% effluent limit.

Ambient MA95-14

Between June 2016 and July 2021, Massachusetts Maritime Academy staff collected water from the Cape Cod Canal for use as dilution water in their whole effluent toxicity tests. Survival of *M. bahia* exposed (48-hours) to the canal water was excellent (100%) for the six tests conducted.

Effluent MA95-14

Except for the June 2019 test, no acute whole effluent toxicity (WET) was detected in the Massachusetts Maritime Academy acute tests using *M. bahia* in the five tests conducted between June 2016 and July 2021 (i.e., LC50 >100% effluent, ANOEC= 100% effluent). The LC50 in the June 2019 test was also >100% effluent which the ANOEC was 50% effluent.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_MMA6	09/05/18	10/18/18	0.9	4	7.0	7.7	0	0	0
BBC_MMA6	09/05/18	10/18/18	5.8	4	7.0	7.6	0	0	0
BBC_MMA6	05/28/19	10/22/19	0.2	12	6.6	8.4	0	0	0
BBC_MMA6	05/28/19	10/22/19	5.7	12	7.3	8.4	0	0	0
BBC_MMA7	09/05/18	10/18/18	0.2	4	7.1	7.7	0	0	0
BBC_MMA7	09/05/18	10/18/18	8.0	4	7.1	7.6	0	0	0
BBC_MMA7	05/28/19	10/22/19	0.6	12	6.4	8.3	0	0	0
BBC_MMA7	05/28/19	10/22/19	6.3	12	6.4	8.3	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_MMA6	09/05/18	10/18/18	0.2	4	2	20.9	20.3	0
BBC_MMA6	09/05/18	10/18/18	7.0	4	2	20.6	20.2	0
BBC_MMA6	05/28/19	10/22/19	0.2	12	6	21.0	16.8	0
BBC_MMA6	05/28/19	10/22/19	4.8	12	6	21.0	16.6	0
BBC_MMA7	09/05/18	10/18/18	0.2	4	2	20.6	20.1	0
BBC_MMA7	09/05/18	10/18/18	7.5	4	2	20.6	20.0	0
BBC_MMA7	05/28/19	10/22/19	1.0	12	6	20.2	15.9	0
BBC_MMA7	05/28/19	10/22/19	4.6	12	6	20.1	15.8	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_MMA6	2018	0.2	2	0.22	0.22	0.22	4	0.53	1.44	1.05	4	0
BBC_MMA6	2018	6.1	2	0.21	0.24	0.22	4	0.56	1.22	0.83	4	0
BBC_MMA6	2019	0.2	8	0.17	0.33	0.24	12	0.64	6.04	2.73	10	0
BBC_MMA6	2019	5.7	9	0.14	0.31	0.23	12	0.53	5.77	2.67	10	0
BBC_MMA7	2018	0.2	2	0.20	0.24	0.22	4	0.72	1.30	0.97	4	0
BBC_MMA7	2018	7.7	2	0.19	0.20	0.19	4	0.77	1.26	1.03	4	0
BBC_MMA7	2019	0.6	9	0.16	0.32	0.24	12	0.65	6.52	2.71	9	0
BBC_MMA7	2019	6.3	7	0.09	0.34	0.23	12	0.74	7.54	2.65	11	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_MMA6	09/05/18	09/05/18	1	4.9	4.9	4.9
BBC_MMA6	05/28/19	10/22/19	6	3.3	5.0	4.2
BBC_MMA7	09/05/18	09/05/18	1	5.8	5.8	5.8
BBC_MMA7	09/23/19	10/22/19	2	3.5	4.5	4.0

Toxics and other pollutants (metals, ammonia, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_MMA6	09/05/18	10/18/18	0.9	4	0.019	0.034	0.023
BBC_MMA6	09/05/18	10/18/18	5.8	4	0.019	0.031	0.025
BBC_MMA6	05/28/19	10/22/19	0.2	12	0.004	0.051	0.016
BBC_MMA6	05/28/19	10/22/19	5.7	12	0.004	0.048	0.017
BBC_MMA7	09/05/18	10/18/18	0.2	4	0.016	0.028	0.022
BBC_MMA7	09/05/18	10/18/18	8.0	4	0.017	0.027	0.022
BBC_MMA7	05/28/19	10/22/19	0.6	12	0.004	0.047	0.019
BBC_MMA7	05/28/19	10/22/19	6.3	12	0.004	0.047	0.020

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Cape Cod Canal (MA95-14); therefore the Fish Consumption Use is Not Assessed	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

Cape Cod Canal (MA95-14): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.1275 sq mi (96%). The sum of the approved, conditionally approved, and restricted shellfish growing areas represents 0 sq mi (0%). The prohibited shellfish growing area represents 1.1275 sq mi (96%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of prohibited and approved, conditionally approved, and/or restricted. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB45.0	Cape Cod Canal	Prohibited	1.12749	96.4%
CCB35.0	Sandwich North Coastal	Approved	0.00002	0.0%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Cape Cod Canal (MA95-14) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Cape Cod Canal (MA95-14) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Cape Cod Canal (MA95-14): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.1275 sq mi (96%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Cape Cod Canal (MA95-14) so it is Not Assessed.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Cape Cod Canal (MA95-14): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.1275 sq mi (96%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Cedar Dell Lake (MA95021)

Location:	Dartmouth.
AU Type:	FRESHWATER LAKE
AU Size:	23 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	5	Enterococcus		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Enterococcus	Source Unknown (N)				X	

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aquatic Life Use for Cedar Dell Lake (MA95021) so it is Not Assessed.	

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Cedar Dell Lake (MA95021); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Cedar Dell Lake (MA95021) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

UMass Dartmouth staff collected *Enterococci* bacteria samples at this Cedar Dell Lake AU (MA95021) on the trail to the lake from Dell dormitory access road (UMassD_10) between June and September 2019 (n=15). Data analysis indicated that 79% of the intervals had GM's >35 cfu/100 ml and 13% of the samples exceeded the 130 cfu/100 ml STV. Since the *Enterococci* data exceeded the use attainment impairment thresholds for this single year high frequency dataset, the Primary Contact Recreational Use for Cedar Dell Lake (MA95021) is assessed as Not Supporting. An *Enterococcus* impairment is being added.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
UMassD_10	UMass Dartmouth	Water Quality	Cedar Dell Lake	Trail to the lake from Dell dormitory access road.	41.624881	-71.015245

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (UMass-Dartmouth 2019) (MassDEP Undated4)

[Result units are CFU/100ml or MPN/100ml]

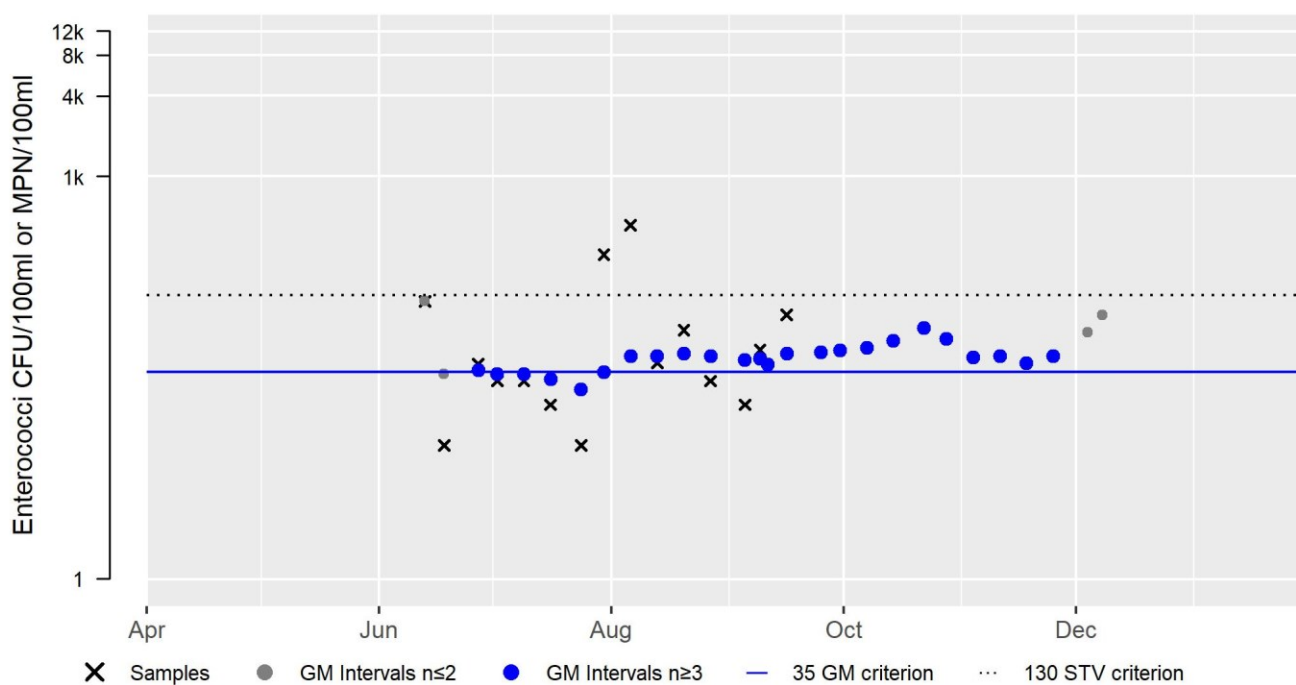
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
UMassD_10	UMass Dartmouth	Enterococci	06/13/19	09/16/19	15	10	435	46

UMassD_10 Enterococci (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	15
SeasGM	46
#GMI	24
#GMI Ex	19
%GMI Ex	79
n>STV	2
%n>STV	13

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2019



Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E. coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Cedar Dell Lake (MA95021) so it is Not Assessed.	

Cedar Island Creek (MA95-52)

Location:	Estuarine portion southwest of the intersection of Parker Drive and Camardo Drive, Wareham to the mouth at Marks Cove, Wareham.
AU Type:	ESTUARY
AU Size:	0.01 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aquatic Life Use for Cedar Island Creek (MA95-52) so it is Not Assessed.	

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Cedar Island Creek (MA95-52); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Cedar Island Creek (MA95-52): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0091 sq mi (70%). The approved shellfish growing area represents 0.0038 sq mi (29%). The prohibited shellfish growing area represents 0.0053 sq mi (41%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB36.0	Wareham River	Approved	0.00380	29.5%
BB36.7	Cedar Island Creek	Prohibited	0.00528	41.0%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Cedar Island Creek (MA95-52) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the status of the Primary Contact Recreation Use for Cedar Island Creek (MA95-52) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Cedar Island Creek (MA95-52): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0091 sq mi (70%). The approved shellfish growing area represents 0.0038 sq mi (29%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the status of the Secondary Contact Recreation Use for Cedar Island Creek (MA95-52) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Cedar Island Creek (MA95-52): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0091 sq mi (70%). The approved shellfish growing area represents 0.0038 sq mi (29%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Cedar Lake (MA95-96344)

Location:	Falmouth (formerly reported as 2010 segment: Cedar Lake MA96344).
AU Type:	FRESHWATER LAKE
AU Size:	20 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	
<p>DMF biologists report that there are two potential barriers providing adequate passage to diadromous fish between Rands Harbor (MA95-78) and Cedar Lake. A small unnamed stream connects the two waterbodies (not an AU). The elevation change at Chestnut Street in Falmouth was assigned a passage score of "0" out of 10 (with 10 equating to no possible passage), indicating that the elevation change is not an obstruction to diadromous fish (population score of 4). DMF biologists also note that the minor stream baffles at this location are adequate and maintained by the town. The Bay Road culvert (and existing fishway) was assigned a passage score of "2" out of 10, indicating that the dam is only a minor obstruction to diadromous fish (population score of 6). The targeted species at both locations were river herring and American eel.</p> <p>Too limited data are available to assess the Aquatic Life Use for Cedar Lake (MA95-96344), so it is assessed as having Insufficient Information.</p>	

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
<p>DMF biologists report that there are two potential barriers providing adequate passage to diadromous fish passage between Rands Harbor (MA95-78) and Cedar Lake. A small unnamed stream connects the two waterbodies (not an AU). The targeted species at both locations were river herring and American eel. The elevation change at Chestnut Street in Falmouth was assigned a passage score of "0" out of 10 (with 10 equating to no possible passage), indicating that the elevation change is not an obstruction to diadromous fish (population score of 4). DMF biologists also note that the minor stream baffles at this location are adequate and maintained by the town. The Bay Road culvert (and existing fishway) was assigned a passage score of "2" out of 10, indicating that the dam is only a minor obstruction to diadromous fish (population score of 6).</p>

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	

No fish toxics monitoring has been conducted in Cedar Lake (MA95-96344); therefore, the Fish Consumption Use is Not Assessed.

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Cedar Lake (MA95-96344) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the status of the Primary Contact Recreation Use for Cedar Lake (MA95-96344) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the status of the Secondary Contact Recreation Use for Cedar Lake (MA95-96344) so it is Not Assessed.	

Charge Pond (MA95025)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	16 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	2	None		Unchanged

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aquatic Life Use for Charge Pond (MA95025) so it is Not Assessed.	

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Charge Pond (MA95025); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Charge Pond (MA95025) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There is one beach in Charge Pond, Plymouth (MA95025) known as Charge Pond (DCR) (ID 4629). This beach was either rarely or never posted with advisories for swimming between 2014 and 2019. The Primary Contact Recreational Use for Charge Pond (MA95025) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the Charge Pond (DCR) beach between 2014 and 2019.	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
4629	Charge Pond (DCR)/Plymouth	41.81760	-70.67560	41.81740	-70.67430	0%	1%	0%	1%	0%	0%	0

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There is one beach in Charge Pond, Plymouth (MA95025) known as Charge Pond (DCR) (ID 4629). This beach was either rarely or never posted with advisories for swimming between 2014 and 2019.</p> <p>The Secondary Contact Recreational Use for Charge Pond (MA95025) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the Charge Pond (DCR) beach between 2014 and 2019.</p>	

Clarks Cove (MA95-38)

Location:	The semi-enclosed waterbody landward of a line drawn between Clarks Point, New Bedford and Ricketsons Point, Dartmouth.
AU Type:	ESTUARY
AU Size:	1.9 SQUARE MILES
Classification/Qualifier:	SA: SFO, CSO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Dissolved Oxygen		Added
5	5	Enterococcus	36172	Unchanged
5	5	Estuarine Bioassessments		Added
5	5	Fecal Coliform	36172	Unchanged
5	5	Nitrogen, Total		Added
5	5	PCBs in Fish Tissue		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Source Unknown (N)	X					
Enterococcus	Combined Sewer Overflows (Y)					X	X
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Combined Sewer Overflows (Y)			X			
Fecal Coliform	Discharges from Municipal Separate Storm Sewer Systems (MS4) (Y)			X			
Fecal Coliform	Municipal (Urbanized High Density Area) (Y)			X			
Nitrogen, Total	Source Unknown (N)	X					
PCBs in Fish Tissue	CERCLA NPL (Superfund) Sites (Y)		X				
PCBs in Fish Tissue	Contaminated Sediments (Y)		X				

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an ~58% loss of eelgrass bed habitat in Clarks Cove between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at eight locations throughout Clarks Cove (MA95-38) in the summers of 2015-2019, from the inner to outer cove as follows: BBC_CC1X, CC1N, CC1A, CC2, CC3, CC4, CC5, and CC6. Stations BBC_CC3 and CC4 were located in the middle of the cove, whereas the remaining stations were located along either the east or west bank (from jetties, docks and piers). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column (at depths typically less than 2m in the upper cove and along the shore, up to depths >5m in the middle of the Cove at BBC_CC4) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 27.1°C (n=470). The minimum dissolved oxygen (DO) was 1.0mg/L (n=449), <6.0mg/L 128 times (29% of the measurements overall), and <5.0mg/L 56 times (12.5% of the measurements overall) between 2015-2019. Excursions from the DO criterion occurred more frequently at the west bank stations (BBC_CC1A and CC5) at a range of depths including the surface waters, and then also for four of the years in the middle of the Cove (BBC_CC4 at ~4-5m depths). Nutrient sampling efforts (ebb tides in June-September at BBC_CC1X, CC1N, CC2, CC3, CC4, and CC6, n=66 with maximum 0.85mg/L at BBC_CC6 in 2017) documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.35-0.52mg/L, with average concentrations >0.4mg/L five of 11 times. The maximum chlorophyll *a* concentration was 54.2µg/L (n=110), >5µg/L 36 times but only twice >10µg/L between 2015-2019 (averages ranging from 2.2 to 8.8µg/L throughout the cove). BBC Secchi disk depths in Clarks Cove were recorded at seven locations (BBC_CC1N, CC1A, CC2, CC3, CC4, CC5, and CC6), usually weekly in the summers of 2015-2019 (n=184). Secchi depths ranged from 0.7 to 4.5m. Ammonia-nitrogen concentrations were generally low (range 0.002 to 0.04mg/L (n=110)), but TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for Clarks Cove (MA95-38) is assessed as Not Supporting based on the loss of eelgrass bed habitat documented by the MassDEP Eelgrass Mapping Project between 1995 and 2017 as well as BBC staff/volunteers data collected between 2015 and 2019 that indicated elevated Total Nitrogen and low Dissolved Oxygen. Impairments for Estuarine Bioassessments (for eelgrass loss) as well as Total Nitrogen and Dissolved Oxygen in agreement with the BBC comments made on the 2018/20 IR, are being added. The prior Alert for loss of eelgrass bed habitat in Clarks Cove is being removed.

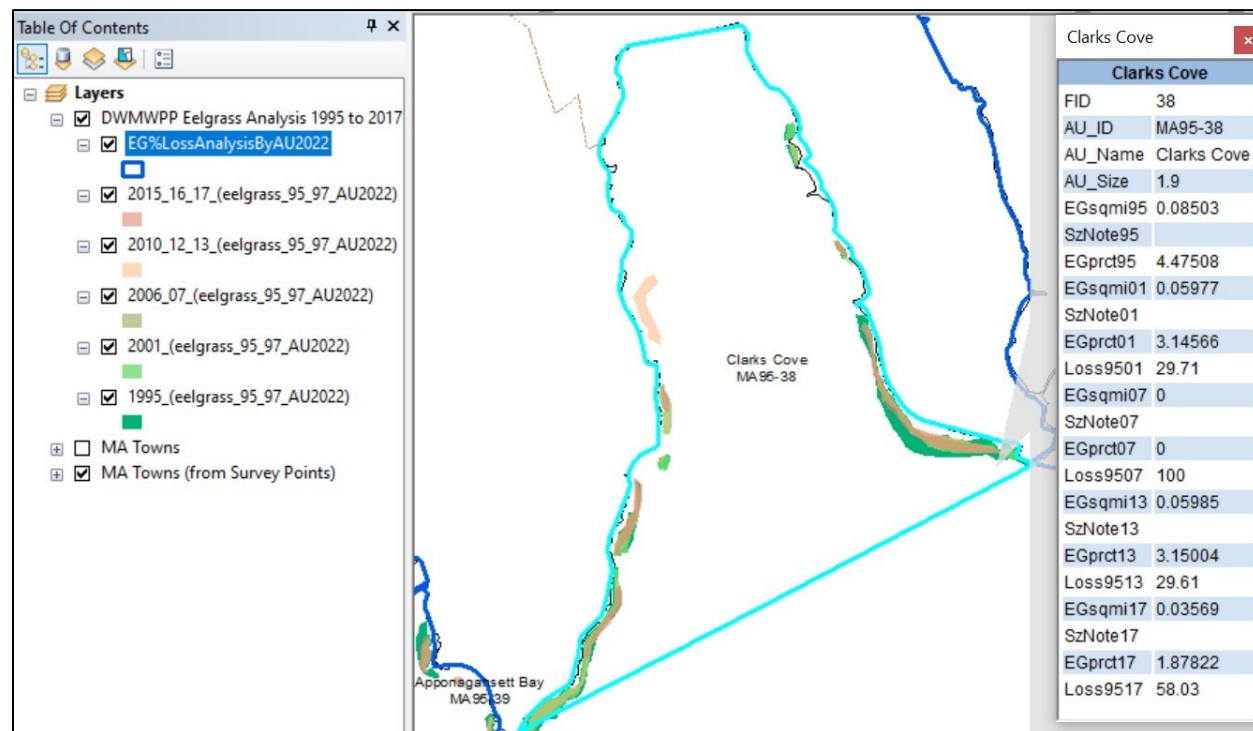
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_CC1A	Buzzards Bay Coalition	Water Quality	Clarks Cove	Clarks Cove Inner, New Bedford	41.608478	-70.930316
BBC_CC1N	Buzzards Bay Coalition	Water Quality	Clarks Cove	Clarks Cove Inner, New Bedford	41.611195	-70.928736
BBC_CC1X	Buzzards Bay Coalition	Water Quality	Clarks Cove	Clarks Cove Inner, New Bedford	41.611092	-70.929391
BBC_CC2	Buzzards Bay Coalition	Water Quality	Clarks Cove	Clarks Cove Inner, New Bedford	41.608496	-70.917891
BBC_CC3	Buzzards Bay Coalition	Water Quality	Clarks Cove	Clarks Cove Outer, New Bedford	41.604389	-70.92215
BBC_CC4	Buzzards Bay Coalition	Water Quality	Clarks Cove	Clarks Cove Outer, New Bedford	41.599181	-70.921089
BBC_CC5	Buzzards Bay Coalition	Water Quality	Clarks Cove	Clarks Cove Outer, Dartmouth	41.593001	-70.927278
BBC_CC6	Buzzards Bay Coalition	Water Quality	Clarks Cove	Clarks Cove Outer, New Bedford	41.594383	-70.910946

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Clarks Cove MA95-38 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~58% loss of eelgrass bed habitat in Clarks Cove between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_CC1A	07/31/15	09/24/15	0.2	12	2.5	5.3	58	25	8
BBC_CC1A	07/31/15	09/24/15	1.6	12	2.5	5.5	50	17	8
BBC_CC1A	06/07/16	08/20/16	0.2	5	7.0	8.7	0	0	0
BBC_CC1A	06/11/16	08/20/16	1.6	4	7.5	8.8	0	0	0
BBC_CC1A	07/28/17	09/17/17	0.2	9	5.6	6.6	11	0	0
BBC_CC1A	07/28/17	09/17/17	1.8	9	4.5	6.2	33	11	0
BBC_CC1A	05/31/18	08/31/18	0.2	14	1.5	6.8	7	7	7
BBC_CC1A	05/31/18	08/31/18	1.6	14	1.0	6.4	14	7	7
BBC_CC1A	06/03/19	09/09/19	0.2	15	4.0	6.2	40	7	0
BBC_CC1A	06/03/19	09/09/19	0.8	15	3.5	5.8	47	13	7
BBC_CC1N	07/24/18	08/21/18	0.2	3	6.6	6.8	0	0	0
BBC_CC1N	07/11/19	08/15/19	0.2	3	6.7	6.8	0	0	0
BBC_CC2	06/16/15	06/29/15	0.2	2	8.4	8.5	0	0	0
BBC_CC2	06/29/16	08/09/16	0.1	3	6.3	7.1	0	0	0
BBC_CC2	06/06/17	09/07/17	0.1	10	5.6	7.2	10	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_CC2	05/30/18	08/21/18	0.2	16	3.0	7.1	6	6	6
BBC_CC2	07/08/18	08/20/18	0.4	7	2.5	6.3	14	14	14
BBC_CC2	06/03/19	08/15/19	0.2	12	4.0	6.3	25	8	0
BBC_CC3	07/24/18	08/21/18	0.2	3	6.4	6.8	0	0	0
BBC_CC3	07/11/19	08/15/19	0.2	3	7.1	7.8	0	0	0
BBC_CC4	05/28/15	09/22/15	0.2	17	6.5	7.4	0	0	0
BBC_CC4	05/28/15	09/22/15	4.3	17	3.7	6.3	29	18	6
BBC_CC4	05/31/16	09/24/16	0.2	17	5.2	7.0	6	0	0
BBC_CC4	05/31/16	09/24/16	4.3	18	3.0	5.9	44	22	11
BBC_CC4	06/12/17	09/16/17	0.2	19	6.4	7.4	0	0	0
BBC_CC4	06/12/17	09/16/17	5.0	20	3.7	5.7	45	30	15
BBC_CC4	06/01/18	09/20/18	0.2	25	6.0	7.3	0	0	0
BBC_CC4	06/01/18	09/20/18	5.1	22	1.9	5.1	59	41	27
BBC_CC4	06/27/19	09/18/19	0.4	11	6.7	7.6	0	0	0
BBC_CC4	06/27/19	09/18/19	4.6	8	5.7	6.6	38	0	0
BBC_CC5	05/28/15	09/23/15	0.2	16	4.5	5.8	50	13	0
BBC_CC5	06/01/16	09/24/16	0.2	21	4.0	5.6	62	19	0
BBC_CC5	07/27/16	07/27/16	3.9	1	5.3	5.3	100	0	0
BBC_CC5	05/31/17	09/13/17	0.2	17	4.5	5.9	35	6	0
BBC_CC5	05/30/18	09/19/18	0.2	19	2.0	4.9	68	42	26
BBC_CC5	05/30/19	08/01/19	0.2	10	5.0	6.7	10	0	0
BBC_CC5	07/21/19	09/23/19	0.3	8	4.0	5.3	50	50	0
BBC_CC6	06/16/15	06/29/15	0.2	2	7.1	7.7	0	0	0
BBC_CC6	06/16/15	06/29/15	1.7	2	6.8	7.4	0	0	0
BBC_CC6	06/06/17	09/05/17	0.2	2	7.3	7.7	0	0	0
BBC_CC6	07/24/18	08/21/18	0.2	3	6.6	6.7	0	0	0
BBC_CC6	07/11/19	08/15/19	0.2	3	6.8	7.8	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_CC1A	07/31/15	09/24/15	0.2	12	10	26.0	24.3	0
BBC_CC1A	07/31/15	09/24/15	1.6	12	10	27.0	24.2	0
BBC_CC1A	06/07/16	08/20/16	0.2	6	6	25.0	21.5	0
BBC_CC1A	06/11/16	08/20/16	1.5	4	4	25.0	21.9	0
BBC_CC1A	07/28/17	09/17/17	0.2	9	8	23.6	21.6	0
BBC_CC1A	07/28/17	09/17/17	1.8	9	8	23.3	21.6	0
BBC_CC1A	06/11/18	08/31/18	0.2	13	13	26.5	22.5	0
BBC_CC1A	06/11/18	08/31/18	1.6	13	13	26.5	22.5	0
BBC_CC1A	06/03/19	09/09/19	0.2	15	15	25.0	21.7	0
BBC_CC1A	06/03/19	09/09/19	0.8	15	15	25.0	21.5	0
BBC_CC1N	07/13/15	08/25/15	0.2	3	3	26.0	25.0	0
BBC_CC1N	07/05/16	08/15/16	0.3	3	3	27.0	24.7	0
BBC_CC1N	07/06/17	08/17/17	0.2	2	2	25.0	24.5	0
BBC_CC1N	07/24/18	08/21/18	0.2	3	3	26.9	25.0	0
BBC_CC1N	07/11/19	08/15/19	0.2	4	4	24.2	23.4	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_CC1X	08/03/17	08/03/17	0.5	1	1	24.0	24.0	0
BBC_CC2	06/16/15	09/24/15	0.2	7	6	26.0	23.5	0
BBC_CC2	01/06/16	09/26/16	0.2	12	9	27.0	23.3	0
BBC_CC2	03/08/17	09/19/17	0.2	16	14	26.0	21.9	0
BBC_CC2	06/04/18	08/21/18	0.2	15	15	27.1	23.9	0
BBC_CC2	07/08/18	08/20/18	0.4	7	7	27.0	25.0	0
BBC_CC2	06/03/19	08/15/19	0.2	14	14	24.8	21.7	0
BBC_CC3	07/13/15	08/25/15	0.2	3	3	25.0	24.0	0
BBC_CC3	07/05/16	08/15/16	0.3	3	3	27.0	25.0	0
BBC_CC3	08/03/17	08/17/17	0.2	2	2	25.0	24.0	0
BBC_CC3	07/24/18	08/21/18	0.2	3	3	26.8	25.1	0
BBC_CC3	07/11/19	08/15/19	0.2	4	4	24.0	23.4	0
BBC_CC4	05/28/15	09/22/15	0.2	20	17	25.6	22.8	0
BBC_CC4	05/28/15	09/22/15	4.3	17	14	25.4	22.2	0
BBC_CC4	05/31/16	09/24/16	0.2	24	20	27.0	23.2	0
BBC_CC4	05/31/16	09/24/16	4.3	21	17	25.7	22.2	0
BBC_CC4	05/31/17	09/16/17	0.2	22	20	25.1	22.1	0
BBC_CC4	05/31/17	09/16/17	5.0	20	18	22.9	21.1	0
BBC_CC4	06/01/18	09/05/18	0.2	22	22	26.5	23.2	0
BBC_CC4	06/01/18	09/20/18	5.0	20	19	25.8	21.8	0
BBC_CC4	06/27/19	09/18/19	0.4	12	11	23.8	22.7	0
BBC_CC4	06/27/19	09/18/19	4.4	8	7	23.7	21.8	0
BBC_CC5	05/28/15	09/23/15	0.2	16	13	24.0	20.8	0
BBC_CC5	06/01/16	09/24/16	0.2	21	18	26.0	22.6	0
BBC_CC5	07/27/16	07/27/16	3.9	1	1	23.7	23.7	0
BBC_CC5	05/31/17	09/13/17	0.2	17	16	26.0	22.0	0
BBC_CC5	06/05/18	09/15/18	0.2	17	17	27.0	23.1	0
BBC_CC5	05/30/19	08/01/19	0.2	10	9	27.0	21.4	0
BBC_CC5	07/21/19	09/23/19	0.3	8	6	27.0	24.7	0
BBC_CC6	06/16/15	09/24/15	0.2	7	6	25.5	23.1	0
BBC_CC6	06/16/15	06/29/15	1.7	2	2	20.3	19.5	0
BBC_CC6	01/06/16	09/26/16	0.2	9	6	27.0	22.8	0
BBC_CC6	03/08/17	09/19/17	0.2	8	6	25.0	21.2	0
BBC_CC6	07/24/18	08/21/18	0.2	3	3	26.4	24.9	0
BBC_CC6	07/11/19	08/15/19	0.2	4	4	23.6	23.2	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_CC1N	2015	0.2	3	0.41	0.43	0.42	3	3.26	5.83	4.25	2	0
BBC_CC1N	2016	0.3	2	0.44	0.51	0.48	3	3.18	5.83	4.46	2	0
BBC_CC1N	2017	0.2	2	0.71	0.75	0.73	2	2.78	6.50	4.64	1	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_CC1N	2018	0.2	3	0.25	0.40	0.35	3	4.60	6.96	5.95	1	0
BBC_CC1N	2019	0.2	2	0.33	0.50	0.42	4	1.56	6.76	3.60	3	0
BBC_CC1X	2017	0.5	1	0.64	0.64	0.64	1	2.24	2.24	2.24	1	0
BBC_CC2	2015	0.2	6	0.28	0.61	0.41	7	3.35	8.77	5.25	4	0
BBC_CC2	2016	0.2	5	0.25	0.55	0.35	9	1.97	5.77	3.13	7	0
BBC_CC2	2017	0.2	7	0.19	0.68	0.49	9	2.00	7.30	4.43	7	0
BBC_CC2	2018	0.2	3	0.27	0.42	0.37	3	3.37	6.96	5.71	1	0
BBC_CC2	2019	0.2	1	0.35	0.35	0.35	4	0.96	4.56	3.10	4	0
BBC_CC3	2015	0.2	2	0.45	0.46	0.45	3	2.80	19.27	8.77	2	1
BBC_CC3	2016	0.3	1	0.45	0.45	0.45	3	1.55	4.89	3.47	3	0
BBC_CC3	2017	0.2	--	--	--	--	2	3.35	8.23	5.79	1	0
BBC_CC3	2018	0.2	3	0.27	0.43	0.35	3	3.48	7.77	5.63	1	0
BBC_CC3	2019	0.2	1	0.34	0.34	0.34	4	3.34	6.09	4.60	2	0
BBC_CC4	2015	0.2	2	0.40	0.67	0.54	3	2.90	4.49	3.80	3	0
BBC_CC4	2016	0.3	--	--	--	--	3	1.73	5.13	3.25	2	0
BBC_CC4	2017	0.2	1	0.43	0.43	0.43	2	5.47	5.57	5.52	0	0
BBC_CC4	2018	0.2	3	0.36	0.53	0.42	3	3.52	8.33	5.40	2	0
BBC_CC4	2019	0.2	1	0.30	0.30	0.30	4	2.97	7.52	4.70	3	0
BBC_CC6	2015	0.2	6	0.21	0.61	0.35	7	1.75	5.94	3.99	5	0
BBC_CC6	2016	0.4	1	0.38	0.38	0.38	9	1.21	54.20	8.81	7	1
BBC_CC6	2017	0.2	6	0.32	0.85	0.52	9	1.99	6.37	3.87	7	0
BBC_CC6	2018	0.2	3	0.29	0.31	0.30	3	3.84	7.81	5.59	1	0
BBC_CC6	2019	0.2	1	0.32	0.32	0.32	4	2.09	6.66	4.81	2	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_CC1A	07/31/15	09/24/15	8	1.2	2.0	1.5
BBC_CC1A	06/07/16	08/20/16	4	1.2	1.7	1.5
BBC_CC1A	08/07/17	09/17/17	4	1.1	2.3	1.8
BBC_CC1A	05/31/18	08/15/18	6	1.3	2.1	1.6
BBC_CC1A	06/03/19	08/28/19	9	0.7	1.7	1.0
BBC_CC1N	07/13/15	08/25/15	3	1.6	2.3	1.9
BBC_CC1N	07/05/16	08/15/16	3	1.8	2.1	2.0
BBC_CC1N	08/17/17	08/17/17	1	2.4	2.4	2.4
BBC_CC1N	07/24/18	08/21/18	3	1.0	3.2	2.3
BBC_CC1N	07/11/19	08/15/19	3	1.0	3.0	2.2
BBC_CC2	07/13/15	08/25/15	3	1.6	2.5	2.1
BBC_CC2	07/05/16	08/15/16	3	1.1	2.5	2.0
BBC_CC2	08/17/17	08/17/17	1	2.5	2.5	2.5
BBC_CC2	07/24/18	08/21/18	3	0.9	3.2	2.3

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_CC2	07/11/19	08/15/19	4	1.5	3.7	2.6
BBC_CC3	07/13/15	08/25/15	3	1.6	2.5	2.0
BBC_CC3	07/05/16	08/15/16	3	1.9	3.3	2.6
BBC_CC3	08/03/17	08/17/17	2	2.3	2.7	2.5
BBC_CC3	07/24/18	08/21/18	3	0.9	3.1	2.2
BBC_CC3	07/11/19	08/15/19	4	1.4	2.9	2.5
BBC_CC4	05/28/15	09/22/15	17	2.0	3.8	2.9
BBC_CC4	05/31/16	09/24/16	23	2.0	4.5	3.1
BBC_CC4	06/12/17	09/16/17	20	0.7	3.9	2.7
BBC_CC4	06/01/18	09/20/18	22	1.0	3.8	2.7
BBC_CC4	06/27/19	09/18/19	11	1.7	3.4	2.8
BBC_CC5	07/27/16	07/27/16	1	3.3	3.3	3.3
BBC_CC6	07/13/15	08/25/15	3	2.0	2.8	2.4
BBC_CC6	03/08/16	08/15/16	4	1.5	3.0	2.0
BBC_CC6	06/20/17	09/05/17	3	0.9	2.6	1.5
BBC_CC6	07/24/18	08/21/18	3	1.6	3.0	2.4
BBC_CC6	07/11/19	08/15/19	4	2.0	3.2	2.6

Public comment submitted by Buzzards Bay Coalition as part of the 2018/20 IR

D. Clarks Cove Fails to Meet State Water Quality Standards and Must be Listed on the 2018/2020 List of Category 5 Waters for Total Nitrogen.

The Coalition requests that Clarks Cove be listed as impaired for total nitrogen. The Coalition's water quality monitoring data support its listing.

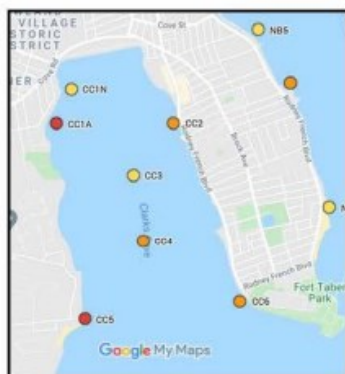
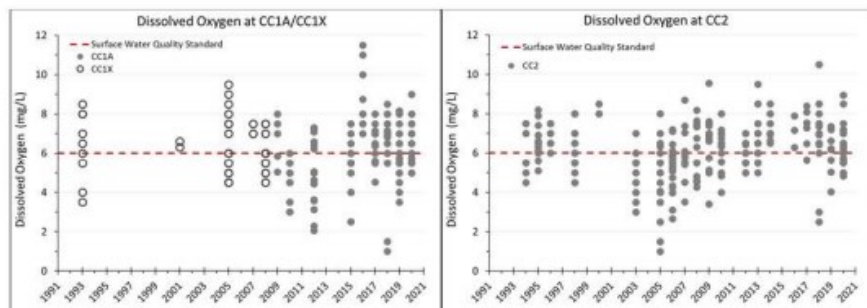


Figure 13. Clarks Cove Site Map

Wings Cove demonstrates water quality decline related to excess nutrients. As described above, excessive levels of nitrogen are common in southeastern Massachusetts and result in ecosystem degradation with impacts including loss of eelgrass beds, algae blooms, fish kills and reductions in important marine life. In order to target areas suffering from excessive levels of nitrogen, like Clarks Cove, and remove as much nitrogen as possible from these areas, it is imperative that MassDEP list Clarks Cove as impaired for total nitrogen, requiring a TMDL for nitrogen.

4. Clarks Cove Dissolved Oxygen

The Coalition submits oxygen data from multiple years from stations CC1A, CC1X, CC2, CC4, and CC5 depicting water quality impairment due to nutrient over-enrichment. The Coalition's dissolved oxygen data show that Clarks Cove consistently falls below the numeric criteria of 6 mg/L as designated in 314 CMR 4.05(4)(a)(1)(a) and warrants listing on the 303(d) list.



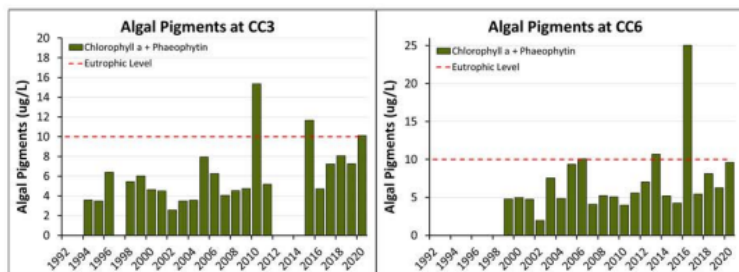


Figure 15. Phytoplankton Pigments in Clarks Cove

The data presented in Figure 15 show periodic high levels of algal pigments at sampling stations throughout Clarks Cove. There also appears to be a long-term trend of increasing pigments over time in Clarks Cove. High concentrations of chlorophyll indicate degraded water clarity in violation of the excellent aesthetic value required in Massachusetts Surface Water Quality Standards.

6. Clarks Cove Total Nitrogen Data

The Coalition's total nitrogen data for Clarks Cove suggests that the nitrogen levels are leading to the low dissolved oxygen numbers and promoting the algae growth depicted above.

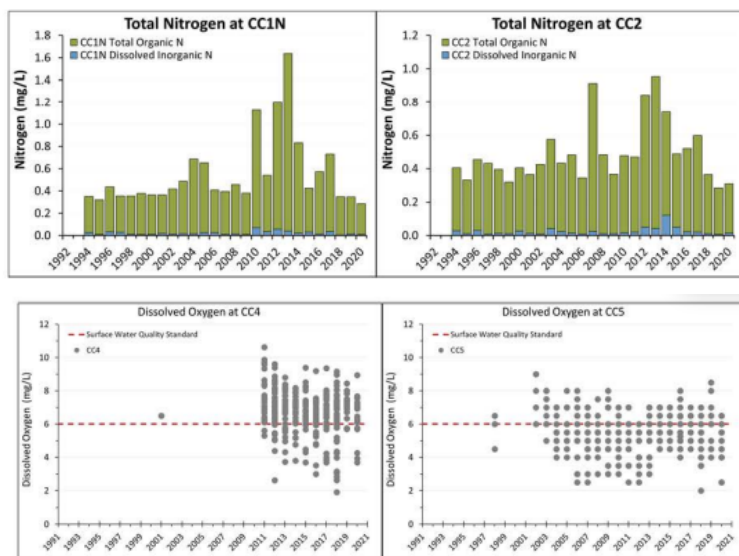
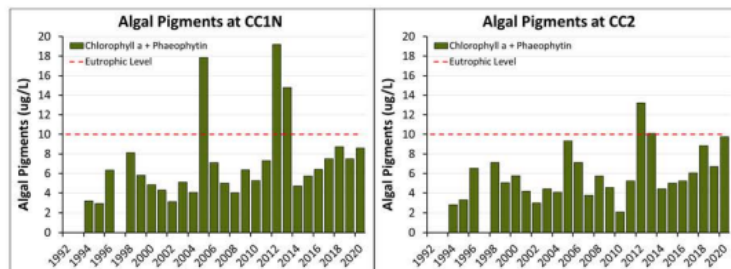


Figure 14. Dissolved Oxygen Concentrations in Clarks Cove

The dissolved oxygen concentrations in Figure 14 clearly shows many samples below the numeric dissolved oxygen criteria established in the Massachusetts Surface Water Quality Standards.

5. Chlorophyll Data

The Coalition's chlorophyll data show that Clarks Cove does not consistently possess the excellent aesthetic values required of SA waters pursuant to 314 CMR 4.05(4)(a), "These waters shall have excellent aesthetic value" and warrants listing on the 303(d) list.



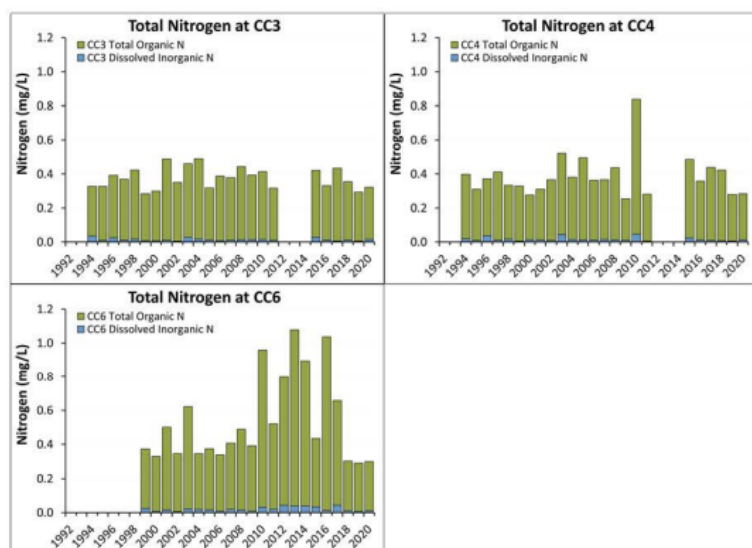


Figure 16. Total Nitrogen in Clarks Cove

Figure 16 exhibits high total nitrogen concentrations in Clarks Cove, in some years reaching as high as 1 mg/L at stations CC1N and CC6 and 0.8 mg/L at stations CC2 and CC4. The incidences of high total nitrogen concentration and high chlorophyll indicate that Clarks Cove fails to attain state water quality standards and must be listed on the 303d list as impaired for total nitrogen.

The combined data above demonstrate that Clarks Cove is suffering from eutrophication due to excess nutrients and must be listed on the Commonwealth of Massachusetts' 303(d) list of Category 5 waters requiring a TMDL for total nitrogen. Dissolved oxygen data at sampling sites CC1A, CC1X, CC2, CC4, and CC5 are in clear violation of surface water quality standards, falling below dissolved oxygen levels of 6 mg/L. Elevated chlorophyll levels that degrade water clarity and aesthetic value, as well as high total nitrogen concentrations are evident at multiple stations.

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

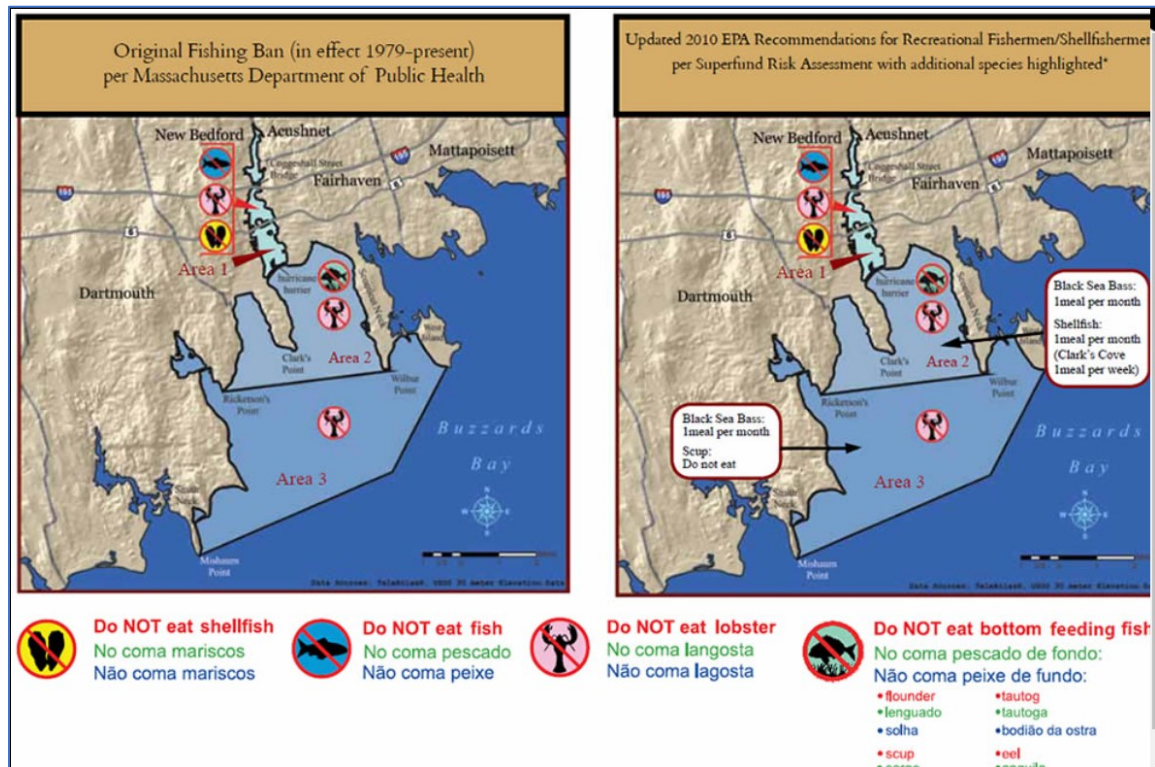
Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_CC1N	07/13/15	08/25/15	0.2	3	0.009	0.042	0.023
BBC_CC1N	07/05/16	08/15/16	0.3	3	0.006	0.016	0.012
BBC_CC1N	07/06/17	08/17/17	0.2	2	0.013	0.018	0.015
BBC_CC1N	07/24/18	08/21/18	0.2	3	0.002	0.003	0.003
BBC_CC1N	07/11/19	08/15/19	0.2	4	0.004	0.018	0.011
BBC_CC1X	08/03/17	08/03/17	0.5	1	0.018	0.018	0.018
BBC_CC2	06/16/15	09/24/15	0.2	7	0.007	0.039	0.018
BBC_CC2	01/06/16	09/26/16	0.2	9	0.004	0.027	0.012
BBC_CC2	01/09/17	09/19/17	0.2	9	0.004	0.021	0.011
BBC_CC2	07/24/18	08/21/18	0.2	3	0.002	0.013	0.007
BBC_CC2	07/11/19	08/15/19	0.2	4	0.004	0.012	0.006
BBC_CC3	07/13/15	08/25/15	0.2	3	0.009	0.023	0.017
BBC_CC3	07/05/16	08/15/16	0.3	3	0.006	0.015	0.009
BBC_CC3	08/03/17	08/17/17	0.2	2	0.004	0.006	0.005

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_CC3	07/24/18	08/21/18	0.2	3	0.003	0.015	0.008
BBC_CC3	07/11/19	08/15/19	0.2	4	0.004	0.011	0.006
BBC_CC4	07/13/15	08/25/15	0.2	3	0.008	0.034	0.021
BBC_CC4	07/05/16	08/15/16	0.3	3	0.006	0.015	0.011
BBC_CC4	08/03/17	08/17/17	0.2	2	0.007	0.007	0.007
BBC_CC4	07/24/18	08/21/18	0.2	3	0.003	0.012	0.006
BBC_CC4	07/11/19	08/15/19	0.2	4	0.004	0.006	0.005
BBC_CC6	06/16/15	09/24/15	0.2	7	0.009	0.033	0.018
BBC_CC6	01/06/16	09/26/16	0.2	9	0.004	0.020	0.009
BBC_CC6	01/09/17	09/19/17	0.2	9	0.006	0.036	0.015
BBC_CC6	07/24/18	08/21/18	0.2	3	0.002	0.013	0.006
BBC_CC6	07/11/19	08/15/19	0.2	4	0.004	0.017	0.007

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
The Fish Consumption Use for Clarks Cove (MA95-38) will continue to be assessed as Not Supporting, with the PCB's in Fish Tissue impairment being carried forward. EPA and MA DPH recommend the public not eat lobster, nor specific bottom feeding fish (flounder, tautog, scup, or eel), and should limited consumption of black sea bass to one meal per month and shellfish from Clark's Cove to one meal per week because of PCB contamination (EPA 2022).	

New Bedford Harbor Fish Consumption Regulations and Recommendations (EPA 2022)



Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Clarks Cove (MA95-38): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.8668 sq mi (98%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is <100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB11.0	Dartmouth East Coastal, Approved	Approved	0.00000	0.0%
BB11.2	Dartmouth East Coastal North	Prohibited	0.00013	0.0%
BB13.1	Clarks Cove, Center	Conditionally Approved	1.26616	66.7%
BB13.2	Clarks Cove, Southwest (The Pie)	Conditionally Approved	0.32468	17.1%
BB13.3	Clarks Cove, West	Prohibited	0.05262	2.8%
BB13.4	Clarks Cove, North	Prohibited	0.08700	4.6%
BB13.5	Clarks Cove, East	Prohibited	0.00023	0.0%
BB13.7	Clarks Cove, South Prohibited	Prohibited	0.13596	7.2%
BB14.2	New Bedford East Coastal (WWTP)	Prohibited	0.00000	0.0%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Clarks Cove (MA95-38) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>There are nine beaches in the Clarks Cove AU (MA95-38); five in Dartmouth and four in New Bedford. The names and ID codes for the beaches are as follows: On the east bank in New Bedford, Kids Beach (ID 3012), 400 Beach (ID 3016), J. Beach (ID 3025), and Squid Beach (ID 3021). On the west bank in Dartmouth, Jones Town Beach North (ID 5600), Jones Town Beach South (ID 2736), Hidden Bay (ID 2727), Oak Hill Shores (ID 5214), and Anthony Beach (ID 2728). All the beaches were either never or infrequently posted for swimming between 2014 and 2019, except for Oak Hill Shores Beach in 2019, when 14% of the bathing season was posted. Of note, Hidden Bay was posted for 7% of the bathing season in 2015 and 2016 (historic postings at this beach >10% of the swimming season had occurred in 2006, 2008, and 2009).</p> <p>The Primary Contact Recreational Use for Clarks Cove (MA95-38) will continue to be assessed as Not Supporting, based on a presumptive impairment decision because of the presence of active CSO outfalls (this waterbody does not have a CSO variance in place). The Enterococcus impairment is being carried forward.</p>	

*Beach Postings***MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019)** (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2727	Hidden Bay/Dartmouth	41.60226	-70.93030	41.60307	-70.92960	0%	7%	7%	0%	0%	0%	0
2728	Anthony Beach/Dartmouth	41.59093	-70.93000	41.59238	-70.92790	0%	0%	0%	0%	0%	0%	0
2736	Jones Town Beach South/Dartmouth	41.60539	-70.93080	41.60470	-70.93070	0%	0%	1%	0%	0%	7%	0
3012	Kids Beach/New Bedford	41.60840	-70.91790	41.60692	-70.91720	4%	3%	0%	1%	0%	2%	0
3016	400 Beach/New Bedford	41.60588	-70.91620	41.60697	-70.91750	3%	2%	0%	2%	0%	6%	0
3021	Squid/New Bedford	41.60224	-70.91390	41.60189	-70.91330	4%	4%	0%	1%	0%	2%	0
3025	J. Beach/New Bedford	41.60569	-70.91630	41.60525	-70.91530	4%	3%	0%	1%	0%	2%	0
5214	Oak Hill Shores/Dartmouth	41.59730	-70.92860	41.59680	-70.92830	0%	0%	0%	0%	0%	14%	1
5600	Jones Town Beach North/Dartmouth	41.60604	-70.93100	41.60539	-70.93080	0%	0%	0%	0%	0%	0%	0

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Clarks Cove (MA95-38): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.8668 sq mi (98%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>There are nine beaches in the Clarks Cove AU (MA95-38); five in Dartmouth and four in New Bedford. The names and ID codes for the beaches are as follows: On the east bank in New Bedford, Kids Beach (ID 3012), 400 Beach (ID 3016), J. Beach (ID 3025), and Squid Beach (ID 3021). On the west bank in Dartmouth: Jones Town Beach North (ID 5600), Jones Town Beach South (ID 2736), Hidden Bay (ID 2727), Oak Hill Shores (ID 5214), and Anthony Beach (ID 2728). All the beaches were either never or infrequently posted for swimming between 2014 and 2019, except for Oak Hill Shores Beach in 2019, when 14% of the bathing season was posted. Of note, Hidden Bay was posted for 7% of the bathing season in 2015 and 2016 (historic postings at this beach >10% of the swimming season had occurred in 2006, 2008, and 2009).</p> <p>The Secondary Contact Recreational Use for Clarks Cove (MA95-38) will continue to be assessed as Not Supporting, based on a presumptive impairment decision because of the presence of active CSO outfalls (this waterbody does not have a CSO variance in place). The Enterococcus impairment is being carried forward.</p>	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Clarks Cove (MA95-38): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.8668 sq mi (98%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

College Pond (MA95030)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	47 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	2	None		Unchanged

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aquatic Life Use for College Pond (MA95030) so it is Not Assessed.	

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in College Pond (MA95030); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for College Pond (MA95030) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There is one beach in College Pond, Plymouth (MA95030) known as College Pond Day Use (DCR) (ID 4630). This beach was either rarely or never posted with advisories for swimming between 2014 and 2019. The Primary Contact Recreational Use for College Pond (MA95030) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the College Pond Day Use (DCR) beach between 2014 and 2019.	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
4630	College Pond Day Use (DCR)/Plymouth	41.86996	-70.66530	41.86928	-70.66000	0%	2%	0%	0%	0%	1%	0

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There is one beach in College Pond, Plymouth (MA95030) known as College Pond Day Use (DCR) (ID 4630). This beach was either rarely or never posted with advisories for swimming between 2014 and 2019.</p> <p>The Secondary Contact Recreational Use for College Pond (MA95030) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the College Pond Day Use (DCR) beach between 2014 and 2019.</p>	

Copicut Reservoir (MA95175)

Location:	Dartmouth/Fall River.
AU Type:	FRESHWATER LAKE
AU Size:	596 ACRES
Classification/Qualifier:	A: PWS, ORW

No usable data were available for Copicut Reservoir (MA95175) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Mercury in Fish Tissue		Unchanged

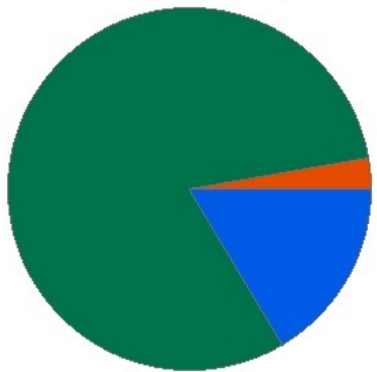
Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Mercury in Fish Tissue	Source Unknown (N)		X			

Copicut River (MA95-43)

Location:	Headwaters, outlet of Copicut Reservoir, Fall River to mouth at inlet of Cornell Pond, Dartmouth.
AU Type:	RIVER
AU Size:	1.3 MILES
Classification/Qualifier:	A: PWS, ORW (Tributary)

Copicut River - MA95-43

Watershed Area: 7.48 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	7.48	5.27	2.7	1.59
Agriculture	0.8%	1.2%	1.1%	1.9%
Developed	2.7%	3.6%	2.3%	3.6%
Natural	80.1%	85.5%	62.1%	71%
Wetland	16.3%	9.7%	34.4%	23.5%
Impervious Cover	1.1%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Mercury in Fish Tissue		Unchanged
5	5	PCBs in Fish Tissue		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Mercury in Fish Tissue	Source Unknown (N)		X			
PCBs in Fish Tissue	CERCLA NPL (Superfund) Sites (Y)		X			
PCBs in Fish Tissue	Contaminated Sediments (Y)		X			

Recommendations

2022 Recommendations
AES: Conduct surveys to better evaluate the nature and extent of a possible aesthetics impairment for the Copicut River (MA95-43), paying close attention to turbidity and other signs of nutrient enrichment.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	
<p>MA DFG biologists conducted backpack electrofishing in June 2018 at two locations within the middle reach of the Copicut River; at the end of the dirt road north of New Bedford rod and gun club (SampleID 7781) and at Collins Rd, New Bedford rod and gun club, Dartmouth (SampleID 7771). The fish communities at these low gradient habitat sites contained at least one or two moderately tolerant/intolerant macrohabitat generalist species (namely yellow perch and chain pickerel), comprising 83% and 54% of the samples, respectively.</p> <p>The Aquatic Life Use for Copicut River (MA95-43) will continue to be assessed as Fully Supporting based on the fish population data collected by Mass DFG biologists during the summer of 2018. The prior Alerts identified due to low flow and the potential effects of water withdrawals on this small drainage area (may be exacerbated by withdrawals from Copicut Reservoir and/or dams), low pH and the Re-Solve Inc. Superfund site in lower subwatershed area are being carried forward. It is also being noted that the sixth "five-year review report" for Re-Solve, Inc. superfund site (dated September 24, 2018) (EPA 2018) documented that OU3 remedial activities (groundwater treatment) are currently ongoing. The original "source control remedies" (which aimed to reduce risks to freshwater aquatic life associated with contact with PCB contaminated sediments and subsequent bioaccumulation) included removal of PCB-contaminated sediments from adjacent wetlands, followed by treatment of soils and remediation/restoration of ~1 acre of wetland. It was noted that these remedies have resulted in no or very low detections of VOCs at all of six surface water sampling locations for many years.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
7771	MassDFG	Fish Community	Copicut River	Collins road, New bedford Rod and Gun Club. Site #2, Dartmouth	41.69203	-71.03361
7781	MassDFG	Fish Community	Copicut River	at the end of dirt road north of New Bedford Rod & Gun Club, Fall River	41.69637	-71.03425

Biological Monitoring Information

Fish Community Data and DELTS

Fish Community Data (2012-2019) Provided by MassDFG. (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net, Gradient: H = High, L = Low; I/MT MG= Intolerant/Moderately Tolerant Macrohabitat Generalist]

[Species List: AE = American Eel, B = Bluegill, BB = Brown Bullhead, CP = Chain Pickerel, GS = Golden Shiner, YP = Yellow Perch]

Sample ID	Sample Date	Method	Sample Type	Gradient	Total Taxa	Total Ind	Cold Ind %	Fluvial Taxa	Fluvial Ind %	Intol Ind %	I/MT MG Taxa	I/MT MG Ind %	Notables	CFR	Species List
7771	06/26/18	BP	TP	L	6	72	0%	0	0%	0%	2	54%	No	No	AE, B, BB, CP, GS, YP,
7781	06/26/18	BP	TP	L	2	30	0%	0	0%	0%	1	83%	No	No	AE, YP,

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO

2022 Use Attainment Summary

The Fish Consumption Use for Copicut River (MA95-43) will continue to be assessed as Not Supporting with the Mercury in Fish Tissue and PCBs in Fish Tissue impairments being carried forward. MA DPH advises *Children under 12, pregnant women, nursing mothers, women of child-bearing age not to eat any fish from the river, while the general public should not eat any American Eel and should limit Largemouth Bass to 2 meals/month* (MassDPH 2021). It should be noted that the sixth “five-year review report” for Re-Solve, Inc. superfund site (dated September 24, 2018) (EPA 2018) recommended that if MA DPH lifts the fishing advisory, the potential human health risk associated with ingestion of PCB-contaminated fish should be evaluated further with current risk evaluation procedures and assumptions (including consumption habits and yields from the water body) to fully document the degree of risk reduction.

Aesthetic

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for the Copicut River (MA95-43) so it is Not Assessed. The Alert previously identified for turbidity and total phosphorus is being carried forward and a recommendation is being made for additional monitoring of aesthetics.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
No bacteria data are available to assess the status of the Primary Contact Recreational Use for the Copicut River (MA95-43) so it is Not Assessed. The Alert previously identified for turbidity and total phosphorus is being carried forward and a recommendation is being made for additional monitoring.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
No data are available to assess the status of the Secondary Contact Recreational Use for the Copicut River (MA95-43) so it is Not Assessed. The Alert previously identified for turbidity and total phosphorus is being carried forward and recommendations is being made for additional monitoring.	

Cornell Pond (MA95031)

Location:	Dartmouth.
AU Type:	FRESHWATER LAKE
AU Size:	12 ACRES
Classification/Qualifier:	A: PWS, ORW (Tributary)

No usable data were available for Cornell Pond (MA95031) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Mercury in Fish Tissue	33880	Unchanged
5	5	PCBs in Fish Tissue		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Mercury in Fish Tissue	Atmospheric Deposition - Toxics (Y)		X			
Mercury in Fish Tissue	Source Unknown (N)		X			
PCBs in Fish Tissue	CERCLA NPL (Superfund) Sites (Y)		X			

Crane Brook Bog Pond (MA95033)

Location:	Carver.
AU Type:	FRESHWATER LAKE
AU Size:	37 ACRES
Classification/Qualifier:	B

No usable data were available for Crane Brook Bog Pond (MA95033) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Non-Native Aquatic Plants*)		Unchanged
5	5	Algae		Unchanged
5	5	Phosphorus, Total		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Non-Native Aquatic Plants*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
Algae	Source Unknown (N)	X		X	X	X
Phosphorus, Total	Source Unknown (N)	X				

Crooked River (MA95-51)

Location:	Estuarine portion east of Indian Neck Road, Wareham to the confluence with the Wareham River, Wareham.
AU Type:	ESTUARY
AU Size:	0.04 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Enterococcus		Removed
4a	4a	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Enterococcus	Applicable WQS attained; based on new data	This Crooked River AU (MA95-51) was first listed as impaired for Enterococcus in the 2016 reporting cycle. The impairment decision was based Massachusetts Department of Public Health (MA DPH) 'beach posting' data from Forbes and Standish Shores beaches in Wareham between 2006 and 2013. The Forbes Beach was posted with swimming advisories that exceeded 10% of the swimming season in five years (77, 47, 22, 21, and 15% in 2008, 2009, 2010, 2012, and 2013, respectively) while Standish Shores Beach was posted for 13% of the swimming season in 2009. The data available for the 2022 reporting cycle is also beach posting data for the same beaches. Between 2014 to 2019, the percent of days the beaches were posted ranged from 0 to 8% with three of six years reporting no postings at either beach (0%). Beach postings that exceed 10% (an indicator of a frequent posting during a swimming season) is one of the use attainment impairment thresholds described in the CALM Guidance Document (MassDEP 2022). Since the number of beach closures in this most recent reporting cycle are well below the 10% threshold for all years with available data and three of the six years had no beach closures at all, the Enterococcus impairment in this Crooked River AU (MA95-51) is being delisted.

Enterococcus

Beach posting data based on weekly Enterococci data collected at Forbes and Standish Shores beaches in Wareham

Original beach posting data summary used to make impairment decision (MassDEP Undated10)

Beach Postings												
MA DPH Beach Posting Data (2005-2013)												
Id	Name	Town	2005	2006	2007	2008	2009	2010	2011	2012	2013	Beach Decision
3186	Forbes	Wareham		0%	0%	77%	47%	22%	7%	21%	15%	Impair
5462	[obsolete] Standish	Wareham					13%					Impair
	Shores											

Current data summary used to remove Enterococcus impairment:

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
3186	Forbes/Wareham	41.74169	-70.69960	41.74139	-70.69930	0%	0%	0%	0%	0%	2%	0
5462	Standish Shores/Wareham	41.74143	-70.70290	41.74180	-70.70180	0%	0%	8%	1%	0%	0%	0

Recommendations

2022 Recommendations
ALU: Conduct additional monitoring for nutrient enrichment indicators; pre-dawn DO plus total nitrogen and chlorophyll <i>a</i> on summer ebb tides, for the Crooked River AU (MA95-51). Be sure to get at least three samples per year for total nitrogen so seasonal averages can be calculated as per CALM requirements.

Designated Use Attainment Decisions

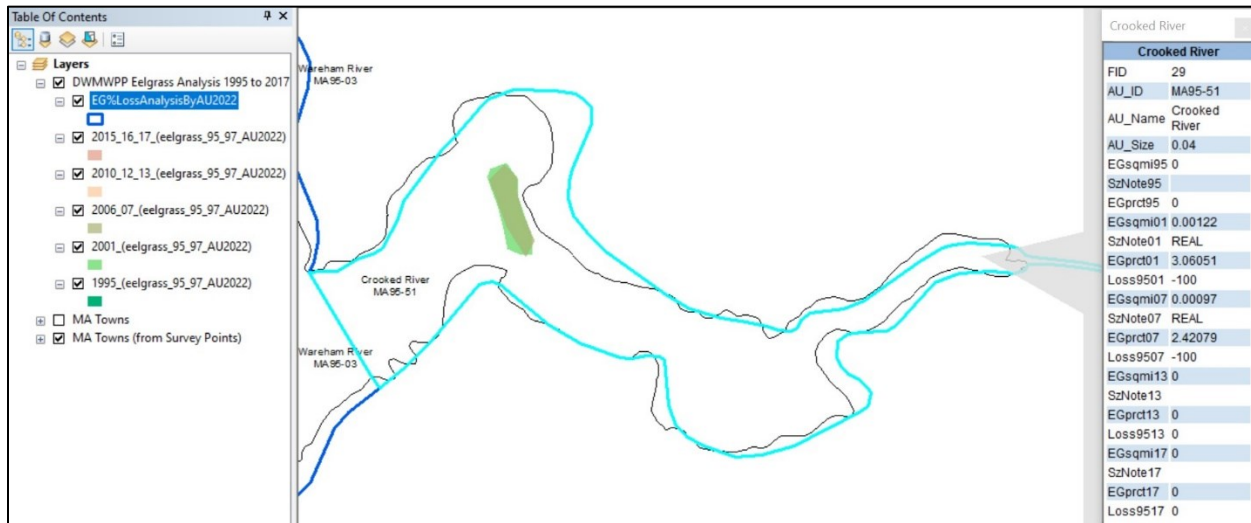
Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	
<p>The MassDEP Eelgrass Mapping Project documented a very small area (~0.00122 and 0.00097 mi²) of eelgrass bed habitat in 2001 and 2007, respectively in the lower the Crooked River (MA95-51) but none was mapped in any other year. According to the draft Wareham River Estuary System TMDL for Total Nitrogen (MassDEP 2022), the benthic habitat was not impaired in this waterbody.</p> <p>Too limited current data are available to evaluate the Aquatic Life Use for the Crooked River (MA95-51) so it is assessed as having Insufficient Information.</p>	

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Crooked River MA95-51 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented a complete loss of eelgrass bed habitat in the Crooked River after 2007.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in the Crooked River (MA95-51); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Crooked River (MA95-51): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0359 sq mi (81%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0359 sq mi (81%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB36.1	Crooked River	Prohibited	0.03590	81.4%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Crooked River (MA95-51) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There are two beaches in Crooked River, Wareham (MA95-51); the names and ID codes for the beaches named from up to downstream are as follows: Forbes (ID 3186) and Standish Shores (ID 5462). The beaches were rarely, if ever, posted with advisories for swimming between 2014 and 2019 (the greatest number of postings occurring at Standish Shores Beach in 2016 with 8% of the bathing season posted).</p> <p>The Primary Contact Recreational Use for the Crooked River (MA95-51) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at either the Forbes or Standish Shores beaches between 2014 and 2019. The Enterococcus impairment is being removed (see justification in removal comments).</p>	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
3186	Forbes/Wareham	41.74169	-70.69960	41.74139	-70.69930	0%	0%	0%	0%	0%	2%	0
5462	Standish Shores/Wareham	41.74143	-70.70290	41.74180	-70.70180	0%	0%	8%	1%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Crooked River (MA95-51): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0359 sq mi (81%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	

There are two beaches in Crooked River, Wareham (MA95-51); the names and ID codes for the beaches named from up to downstream are as follows: Forbes (ID 3186) and Standish Shores (ID 5462). The beaches were rarely posted for swimming, between 2014 and 2019 (the greatest number of postings occurring at Standish Shores Beach in 2016 with 8% of the bathing season posted).

The Secondary Contact Recreational Use for Crooked River (MA95-51) is assessed as Fully Supporting, since there were very few, if any, swimming advisory postings at either the Forbes or Standish Shores beaches between 2014 and 2019.

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary

<p>Crooked River (MA95-51): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0359 sq mi (81%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.</p>
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Curlew Pond (MA95034)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	43 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	2	None		Unchanged

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aquatic Life Use for Curlew Pond (MA95034) so it is Not Assessed.	

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Curlew Pond (MA95034); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Curlew Pond (MA95034) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There is one beach in Curlew Pond, Plymouth (MA95034) known as Curlew Pond (DCR) (ID 4631). This beach was either rarely or never posted with advisories for swimming between 2014 and 2019. The Primary Contact Recreational Use for Curlew Pond (MA95034) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the Curlew Pond (DCR) beach between 2014 and 2019.	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
4631	Curlew Pond (DCR)/Plymouth	41.89142	-70.70020	41.89180	-70.70000	0%	1%	0%	0%	0%	0%	0

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There is one beach in Curlew Pond, Plymouth (MA95034) known as Curlew Pond (DCR) (ID 4631). This beach was either rarely or never posted with advisories for swimming between 2014 and 2019.</p> <p>The Secondary Contact Recreational Use for Curlew Pond (MA95034) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the Curlew Pond (DCR) beach between 2014 and 2019.</p>	

Deer Pond (MA95036)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	9 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Recommendations

2022 Recommendations
ALU: Conduct an aquatic macrophyte survey in Deer Pond (MA95036) when flowering heads are present to determine if any non-native species of <i>Myriophyllum</i> are infesting the pond (confirmation of any non-native species should be made by a qualified state agency/taxonomist).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
As was previously reported, MassDEP staff noted the presence of <i>Myriophyllum</i> sp. in Deer Pond (MA95036) during a July 1995 synoptic survey. Too limited data are available to assess the Aquatic Life Use for Deer Pond (MA95036) so it is Not Assessed. The prior Alert for the presence of <i>Myriophyllum</i> sp. (potentially a non-native species) is being carried forward with a recommendation to conduct an aquatic macrophyte survey.	

Biological Monitoring Information

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (Mattson 2003) (MassDEP 1995)

Summary Statement	Assessment Recommendation
As was previously reported, MassDEP staff noted the presence of <i>Myriophyllum</i> sp. in Deer Pond during a July 1995 synoptic survey. An aquatic macrophyte survey should be conducted to determine whether any of the non-native species of <i>Myriophyllum</i> are present in the pond and the prior Alert should be retained.	Conduct an aquatic macrophyte survey in Deer Pond when flowering heads are present to determine if any non-native species of <i>Myriophyllum</i> are infesting the pond.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO

2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Deer Pond (MA95036); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Deer Pond (MA95036) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for Deer Pond (MA95036) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Deer Pond (MA95036) so it is Not Assessed.	

Destruction Brook (MA95-90)

Location:	Headwaters west of Fisher Road, Dartmouth to mouth at confluence with Slocums River, Dartmouth.
AU Type:	RIVER
AU Size:	3 MILES
Classification/Qualifier:	B

No usable data were available for Destruction Brook (MA95-90) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	3	None		Unchanged

Dicks Pond (MA95038)

Location:	Wareham.
AU Type:	FRESHWATER LAKE
AU Size:	42 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	
<p>DMF biologists note two potential barriers providing adequate passage to diadromous fish between Dicks Pond (MA95038) and the downstream East River. (Note: there is no AU defined for the very small stretch of East River between Onset Bay (MA95-02) and Dicks Pond). The Dicks Pond Dam (NATID# MA) just upstream of Cranberry Highway (Rt.6 in Wareham), was given a passage score of "3" on a 0-10 scale" (minor obstruction). DMF biologists noted that a more efficient fishway and culvert (at the bog owner road) are needed. The Gibbs Brook culvert was given a passage score of "0" (not an obstruction); it was also noted that the 500' culvert was inspected in 2016 and found to be clean. The targeted species at both locations are river herring and American eel with a population score of 3.</p> <p>Too limited data are available to assess the Aquatic Life Use for Dicks Pond (MA95038) so it is assessed as having Insufficient Information.</p>	

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
<p>DMF biologists note two barriers providing adequate passage to diadromous fish between Dicks Pond and the downstream East River. (Note: there is no AU ID for the stretch of East River between Onset Bay (MA95-02) and Dicks Pond). The targeted species are river herring and American eel with a population score of "3". The Dicks Pond Dam (NATID# MA) just upstream of Cranberry Highway (Rt.6 in Wareham), was given a passage score of "3" on a 0-10 scale" (minor obstruction). DMF biologists noted that a more efficient fishway and culvert (at the bog owner road) are needed. The Gibbs Brook culvert was given a passage score of "0" (not an obstruction). It was also noted that the 500' culvert was inspected in 2016 and found to be clean.</p>

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
<p>No fish toxics monitoring has been conducted in Dicks Pond (MA95038); therefore, the Fish Consumption Use is Not Assessed.</p>	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Dicks Pond (MA95038) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for Dicks Pond (MA95038) so it is Not Assessed.	

Secondary Contact Recreation

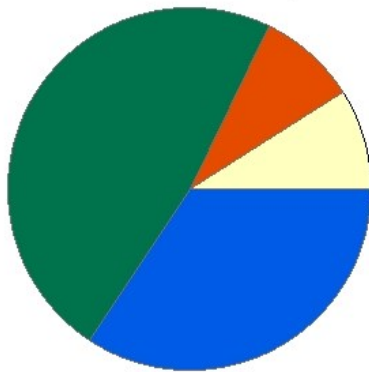
2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Dicks Pond (MA95038) so it is Not Assessed.	

Doggett Brook (MA95-96)

Location:	Headwaters, near Walnut Plain Road, Rochester to mouth at confluence with Sippican River, Rochester.
AU Type:	RIVER
AU Size:	2.9 MILES
Classification/Qualifier:	B

Doggett Brook - MA95-96

Watershed Area: 10.65 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	10.65	10.03	2.73	2.55
Agriculture	9%	8.4%	14.3%	13.8%
Developed	8.8%	8.7%	9.6%	9.3%
Natural	47.9%	48.2%	42.6%	42.6%
Wetland	34.3%	34.7%	33.4%	34.3%
Impervious Cover	3.2%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	5	Benthic Macroinvertebrates		Added
--	5	Dissolved Oxygen		Added
--	5	Lead		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Benthic Macroinvertebrates	Source Unknown (N)	X				
Dissolved Oxygen	Source Unknown (N)	X				
Lead	Source Unknown (N)	X				

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
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Not Supporting	NO
2022 Use Attainment Summary	
<p>MA DFG biologists conducted backpack electrofishing in Doggett Brook at Rt. 105 Rochester in June 2017 (SampleID 6461). The sample was small (only six fish) but included American eel and the fluvial specialist tessellated darter. Further downstream MassDEP biologists conducted biological and water quality monitoring just upstream of Rt. 105 in Rochester (close to the Marion town line) during the summers of 2013 as part of the MAP2 monitoring project. Backpack electrofishing in August 2013 (SampleID 5054) resulted in the capture of 49 individuals and was also comprised of 31% intolerant/moderately tolerant macrohabitat generalists (i.e., chain pickerel, pumpkinseed, redbfin pickerel, and largemouth bass). The benthic (B0832) sample collected in July 2013 had an IBI score of 26 indicative of severely degraded conditions (compared to the Statewide low gradient index). Water quality (W2374) sampling data including both deployed probe and discrete sampling efforts can be summarized as follows: the minimum dissolved oxygen (DO) during the 69-day deploy was 3.8mg/L (<4.0mg/L threshold only once), the 7DADMin was 4.6mg/L (<5.0mg/L threshold 12 times), the 7DADA was 5.0mg/L (<6.5mg/L Early Life Stage threshold 53 times), and the 30-day mean was <6.0mg/L 40 times; the maximum temperature during the two probe deployments (98 days each) was 30.8°C with the 7-DADM >27.7°C eight times and no daily average temperatures >28.3 °C (maximum 24hr rolling average temperature was 28°C); the pH was generally low (ranging 5.6 to 6.3SU, n=3) but was <6.0SU only once; there were generally no physico-chemical indicators of nutrient enrichment problems (seasonal average total phosphorus concentration 0.038mg/L (n=5), max diel DO shift 1.8mg/L, max saturation 81.8%, max pH 6.3SU, and no observations of any dense/very dense filamentous algae during three site visits). Specific conductance and chloride concentrations were both low (max 102µS/cm, n=3 and 19mg/L n=4, respectively), as was total ammonia-nitrogen (TAN) (max 0.05mg/L, n=4 with no toxicity estimated). However, there were three exceedances of the chronic criterion for lead (TU's of 2.5, 2.5, and 1.2 in May, June, and August 2013, respectively), but no other acute or chronic metals criteria exceedances (n=3) (note, dissolved Al data were compared to total recoverable Al criteria, so exceedances cannot be ruled out). The Aquatic Life Use for Doggett Brook is assessed as Not Supporting based on the severely degraded condition of the benthic community, elevated lead concentrations (exceeding the chronic criterion in all three samples), and low Dissolved Oxygen documented by MassDEP staff just upstream of Rt.105 during the summer of 2013.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
5054	MassDEP	Fish Community	Doggett Brook	~2380 ft US/SW of Rt 105 (Marian rd/Front st)	41.72790	-70.79814
6461	MassDFG	Fish Community	Doggett Brook	105 xing, Rochester	41.73333	-70.81441
B0832	MassDEP	Benthic	Doggett Brook/	[approximately 725 meters upstream/southwest from Route 105 (Marion Road/Front Street), Rochester/Marion, MA]	41.727899	-70.798142
W2374	MassDEP	Water Quality	Doggett Brook	[approximately 2380 feet upstream/southwest from Route 105 (Marion Road/Front Street), Rochester/Marion]	41.727899	-70.798142

Biological Monitoring Information

Benthic Macroinvertebrate Data

MassDEP Benthic Macroinvertebrate Data (2011-2017). (MassDEP Undated5)

[Index Biological Condition Class: E= Exceptional, S= Satisfactory, MD= Moderately Degraded, SD= Severely Degraded; High Gradient IBI Thresholds: E= 100-75, S= 74-55, MD= 54-35, SD= 34-0; Low Gradient IBI Thresholds: E= 100-81, S= 80-62, MD= 61-38, SD= 37-0; R qualifier = Rarefaction (100ct) <55]

Station Code	Collection Date	Collection Method	Index Type	Organism Count	Index Score	Index Biological Condition Class	
B0832	07/02/13	RBP multihab	Statewide_Low_Gradient	323	26	SD	

Fish Community Data and DELTS

Fish Community Data (2012-2019) Provided by MassDFG. (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net, Gradient: H = High, L = Low; I/MT MG= Intolerant/Moderately Tolerant Macrohabitat Generalist]

[Species List: AE = American Eel, CP = Chain Pickerel, LMB = Largemouth Bass, P = Pumpkinseed, RP = Redfin Pickerel, SL = Sea Lamprey, TD = Tesselated Darter]

Sample ID	Sample Date	Method	Sample Type	Gradient	Total Taxa	Total Ind	Cold Ind %	Fluvial Taxa	Fluvial Ind %	Intol Ind %	I/MT MG Taxa	I/MT MG Ind %	Notables	CFR	Species List
5054	08/22/13	NS	TP		7	49	0%	1	14%	0%	4	31%	No	No	AE, CP, LMB, P, RP, SL, TD,
6461	06/21/17	BP	TP		2	6	0%	1	17%	0%	0	0%	No	No	AE, TD,

Physico-chemical Water Quality Information

DO, pH, Temperature

MassDEP Long-term Continuous Dissolved Oxygen Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[7DADMin= 7-Day Average of the Daily Minima, 7DADA= 7-Day Average of the Daily Average, CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Day Count	7day Count	30day Count	DO Min (mg/L)	Min 7DADMin (mg/L)	Min 7DADA (mg/L)	Delta DO Max (mg/L)	Count CW 7DADMin <6.0	Count CW 1Day Min <5.0	Count WW Early Life Stages 7DADA <6.5	Count WW Early Life Stages 1Day Min <5.0	Count WW Other Life Stages 7DADMin <5.0	Count WW Other Life Stages 1Day Min <4.0	Count CW 30DADA <8.0	Count WW Other Life Stages 30DADA <6.0
W2374	06/06/13	08/13/13	69	63	40	3.8	4.6	5	1.8	58	13	53	11	12	1	40	40

MassDEP Discrete Dissolved Oxygen Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
W2374	06/05/13	09/11/13	3	5.3	6.3	0	0	0

MassDEP Long-term Continuous Temperature Data (Summer Index 2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; Max Daily Mean= Maximum 24-Hour Average, 7DADM= 7-Day Average of the Daily Maxima, 7DADA= 7-Day Average of the Daily Average, CW= Coldwater, WW= Warmwater; NOTE: In the case of more than one row of data in the same year for a site, different types of temperature probes were deployed.]

Station Code	Start Date	End Date	Index Count	7day Count	Max Daily Mean (°C)	Max Temp (°C)	Max 7DADM (°C)	Max 7DADA (°C)	Count CWTier1 7DADM >20	Count CWTier1 Daily Mean >23.5	Count CWTier2 7DADA >21	Count CWTier2 Daily Mean >24.1	Count WW 7DADM >27.7	Count WW Daily Mean >28.3
W2374	06/06/13	09/10/13	97	91	27.5	30.7	28.2	26.0	81	19	73	16	8	0
W2374	06/06/13	09/10/13	91	79	27.6	30.8	28.3	26.1	70	20	61	16	8	0

24-hour Rolling Average Calculations for MassDEP Short- and Long-term Continuous Temperature Data (Summer Index 2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater; NOTE: In the case of more than one row of data in the same year for a site, different types of temperature probes were deployed.]

Station Code	Start Date	End Date	Count Days Deployed	24hr Rolling Count	Max 24hr Avg Rolling Temp (°C)	Count CWTier1 24hr Avg Rolling >23.5 °C	Count CWTier2 24hr Avg Rolling >24.1 °C	Count WW 24hr Avg Rolling >28.3°C
W2374	06/05/13	09/11/13	98	4320	28.0	1025	759	0
W2374	06/05/13	09/11/13	98	4656	27.9	965	737	0

MassDEP Discrete Temperature Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
W2374	06/05/13	09/11/13	5	5	25.0	21.1	4	1	0	0

MassDEP Discrete pH Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

Station Code	Start Date	End Date	pH Count	pH Min (SU)	pH Max (SU)	pH Count <6.5 & >8.3	pH Count <6.0 & >8.8
W2374	06/05/13	09/11/13	3	5.6	6.3	3	1

Nutrients (Primary Producer Screening, Physico-chemical Screening)

MassDEP Nutrient Enrichment Indicator Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	Delta DO Max (mg/L)	Delta DO Avg (mg/L)	DO Sat Max (%)	pH Max (SU)	Count Algal Obsv.	Dense/V. Dense Film/Fila. Algae
W2374	2013	5	0.028	0.046	0.038	1.8	0.7	81.8	6.3	3	0

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

MassDEP Clean Metals Water Column Data (2011-2018), Acute Criteria Violations. (MassDEP Undated11) (MassDEP Undated6)

[CMC= Criterion Maximum Concentration, TU= Toxic Unit]

Station Code	Data Year	Metals Count	As CMC TU >1	Cd CMC TU >1	Cr III CMC TU >1	Cu CMC TU >1	Pb CMC TU >1	Ni CMC TU >1	Ag CMC TU >1	Zn CMC TU >1
W2374	2013	3	0	0	0	0	0	0	0	0

MassDEP Clean Metals Water Column Data (2011-2018), Chronic Criteria Violations. (MassDEP Undated11) (MassDEP Undated6)

[CCC= Criterion Continuous Concentration, TU= Toxic Unit]

Station Code	Data Year	Metals Count	As CCC TU >1	Cd CCC TU >1	Cr III CCC TU >1	Cu CCC TU >1	Pb CCC TU >1	Ni CCC TU >1	Se CCC TU >1	Zn CCC TU >1
W2374	2013	3	0	0	0	0	3	0	0	0

MassDEP Clean Metals Water Column Data (2011-2018), Selected TU Calculations. (MassDEP Undated11) (MassDEP Undated6)

[CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

Station Code	Sample Date	Cd CMC TU	Cd CCC TU	Cu CMC TU	Cu CCC TU	Pb CMC TU	Pb CCC TU
W2374	05/17/13	0.4	0.6	0.5	0.61	0.1	2.5
W2374	06/28/13	0.3	0.5	0.3	0.43	0.1	2.5
W2374	08/09/13	0.2	0.4	0.2	0.32	0.0	1.2

MassDEP Dissolved Aluminum Water Column Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Since only dissolved aluminum data were available, these data were compared to the default freshwater criteria for total recoverable aluminum (TRA), presented in Appendix E of MassDEP's 2022 CALM. As dissolved Al is a fraction of TRA, an exceedance count of 0 does not rule out violations of the TRA criteria. CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

Station Code	Data Year	Dissolved Al Count	Al Min (mg/L)	Al Max (mg/L)	Al Avg (mg/L)	Al CMC TU Max	Al CCC TU Max	Al CMC TU >1	Al CCC TU >1
W2374	2013	3	0.130	0.19	0.163	0.4	0.8	0	0

MassDEP Total Ammonia Nitrogen (TAN) Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[TAN= NH₃ + NH₄⁺]

Station Code	Data Year	TAN Count	TAN Min (mg/L)	TAN Max (mg/L)	TAN Avg (mg/L)	Count TAN >Chronic	Count TAN >Acute
W2374	2013	4	0.020	0.050	0.038	0	0

MassDEP Chloride Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Chloride Count	Chloride Min (mg/L)	Chloride Max (mg/L)	Chloride Avg (mg/L)	Count Chloride >230	Count Chloride >860
W2374	2013	4	10	19	16	0	0

MassDEP Discrete Specific Conductance Data (2011-2018) Compared to Estimated Chloride Criteria. (MassDEP Undated11) (MassDEP Undated6)

Station Code	Start Date	End Date	SpCond Count	SpCond Min (μ S/cm)	SpCond Max (μ S/cm)	Count SpCond >904	Count SpCond >994	Count SpCond >3193	Count SpCond >3512	Consecutive sets >904	Consecutive sets >994
W2374	06/05/13	09/11/13	3	81	102	0	0	0	0	0	0

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Doggett Brook (MA95-96); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
MassDEP staff recorded aesthetics observations in Doggett Brook ~ 2380 ft upstream from Rt. 105 (Marion Rd/Front St), Rochester/Marion in the summer of 2013. There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DWM-WPP field sampling crews at this site (n=8). The Aesthetics Use for Doggett Brook AU (MA95-96) is assessed as Fully Supporting based on the general lack of any objectionable conditions noted by MassDEP staff during the summer of 2013.	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2374	MassDEP	Water Quality	Doggett Brook	[approximately 2380 feet upstream/southwest from Route 105 (Marion Road/Front Street), Rochester/Marion]	41.727899	-70.798142

Aesthetic Observations

Aesthetics Summary Statements for MassDEP Stations (2011-2018) (MassDEP Undated6)

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W2374	Doggett Brook	2013	8	MassDEP aesthetics observations for station W2374/MAP2-328 on Doggett Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013.

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W2374	2013	8	3	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W2374	Doggett Brook	2013	Color	Dark Tan	2	8
W2374	Doggett Brook	2013	Color	Reddish	5	8
W2374	Doggett Brook	2013	Color	Rusty	1	8
W2374	Doggett Brook	2013	Objectionable Deposits	No	8	8
W2374	Doggett Brook	2013	Odor	None	8	8
W2374	Doggett Brook	2013	Scum	No	7	8
W2374	Doggett Brook	2013	Scum	NR	1	8
W2374	Doggett Brook	2013	Turbidity	None	7	8
W2374	Doggett Brook	2013	Turbidity	Slightly Turbid	1	8

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff collected <i>E. coli</i> bacteria samples in Doggett Brook ~2380 ft upstream/southwest from Rt. 105 (Marion Rd/Front St) in Rochester/Marion (W2374) between May and September 2013 (n=5). Analysis of this single years' worth of limited frequency data indicated that 33% of intervals had GM's >126 cfu/100 ml, one sample exceeded the 410 cfu/100 ml STV, and the seasonal GM was 62 cfu/100 ml.</p> <p>Since the <i>E. coli</i> concentrations were below the use attainment impairment thresholds for this single-year low frequency dataset the Primary Contact Recreational Use for Doggett Brook (MA95-96) is assessed as Fully Supporting.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2374	MassDEP	Water Quality	Doggett Brook	[approximately 2380 feet upstream/southwest from Route 105 (Marion Road/Front Street), Rochester/Marion]	41.727899	-70.798142

Bacteria Data**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP**

Undated11) (MassDEP Undated6)

[Result units are CFU/100ml or MPN/100ml]

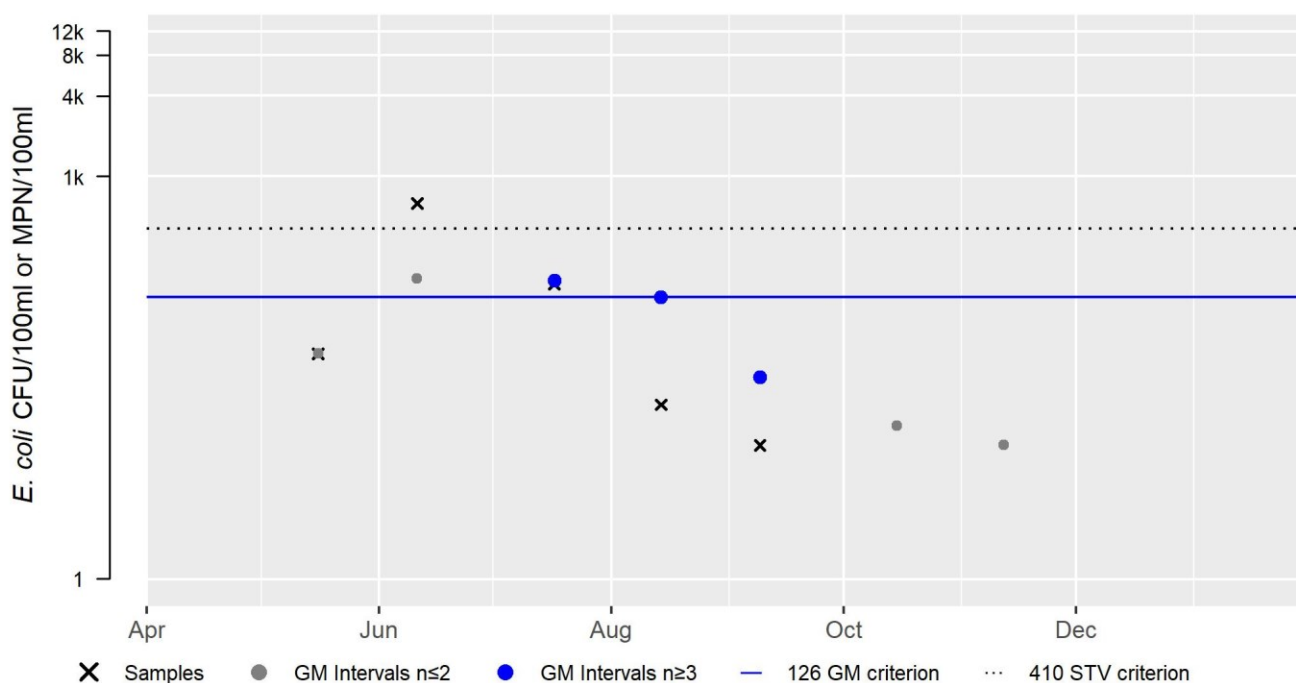
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
W2374	MassDEP	E. coli	05/16/13	09/09/13	5	10	627	62

W2374 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	5
SeasGM	62
#GMI	3
#GMI Ex	1
%GMI Ex	33
n>STV	1
%n>STV	20

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2013



Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
MassDEP staff collected <i>E. coli</i> bacteria samples in Doggett Brook ~ 2380 ft upstream/southwest from Rt. 105 (Marion Rd/Front St) in Rochester/Marion (W2374) between May and September 2013 (n=5). Analysis of this single years' worth of limited frequency data indicated that none of the intervals had GM's >630 cfu/100 ml, no samples exceeded the 1260 cfu/100 ml STV, and the seasonal GM was 62 cfu/100 ml.	
Since the <i>E. coli</i> concentrations were below the use attainment impairment thresholds for this single-year low frequency dataset the Secondary Contact Recreational Use for Doggett Brook (MA95-96) is assessed as Fully Supporting.	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2374	MassDEP	Water Quality	Doggett Brook	[approximately 2380 feet upstream/southwest from Route 105 (Marion Road/Front Street), Rochester/Marion]	41.727899	-70.798142

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP Undated11) (MassDEP Undated6)

[Result units are CFU/100ml or MPN/100ml]

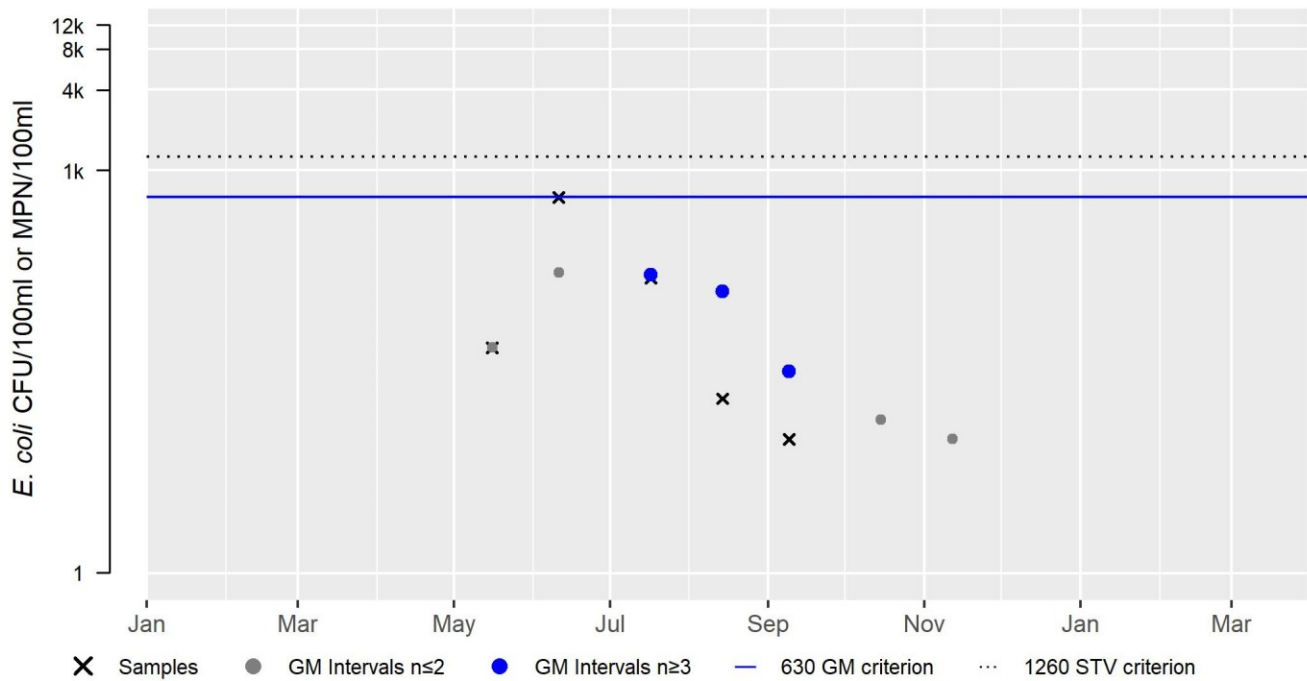
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
W2374	MassDEP	E. coli	05/16/13	09/09/13	5	10	627	62

W2374 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	5
SeasGM	62
#GMI	3
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2013



Dunham Pond (MA95044)

Location:	Carver.
AU Type:	FRESHWATER LAKE
AU Size:	43 ACRES
Classification/Qualifier:	B

No usable data were available for Dunham Pond (MA95044) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Chlorophyll-a		Unchanged
5	5	Transparency / Clarity		Unchanged

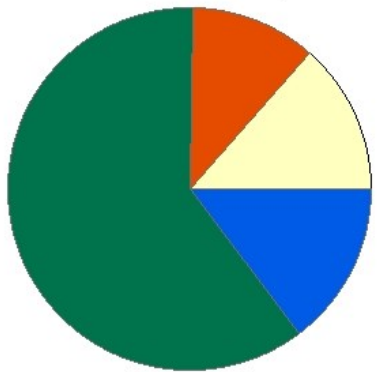
Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Chlorophyll-a	Agriculture (N)	X				
Chlorophyll-a	Source Unknown (N)	X				
Transparency / Clarity	Agriculture (N)	X				
Transparency / Clarity	Source Unknown (N)	X				

Dunhams Brook (MA95-73)

Location:	Headwaters east of the intersection of Cornell and Main roads, Westport to the confluence with the West Branch Westport River at Hicks Cove, Westport.
AU Type:	RIVER
AU Size:	1.4 MILES
Classification/Qualifier:	B

DUNHAMS BROOK - MA95-73

Watershed Area: 0.96 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.96	0.96	0.41	0.41
Agriculture	13.5%	13.5%	8.3%	8.3%
Developed	11.2%	11.2%	6.3%	6.3%
Natural	60.6%	60.6%	56.4%	56.4%
Wetland	14.6%	14.6%	29%	29%
Impervious Cover	3.9%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	5	Escherichia Coli (E. Coli)		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Escherichia Coli (E. Coli)	Source Unknown (N)				X	

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	

MassDEP staff did not observe any dense film or filamentous algae in Dunhams Brook (MA95-73) at either the at Main Rd Westport (W2925, n=2) or at an unnamed road west off the Main Road and Taber Lane intersection, ~250 ft upstream of confluence with West Branch Westport River, Westport (W2926, n=3) sampling locations during summer 2018 surveys conducted as part of the MassDEP Bacteria Source Tracking (BST) project.

Too limited data are available to evaluate the Aquatic Life Use for Dunhams Brook (MA95-73) so it is assessed as having Insufficient Information.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2925	MassDEP	Water Quality	Dunhams Brook	[Main Road, Westport]	41.541200	-71.085850
W2926	MassDEP	Water Quality	Dunhams Brook	[unnamed road west off the Main Road and Taber Lane intersection, approximately 250 feet upstream of confluence with West Branch Westport River, Westport]	41.536670	-71.091484

Physico-chemical Water Quality Information

Nutrients (Primary Producer Screening, Physico-chemical Screening)

MassDEP Nutrient Enrichment Indicator Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	Delta DO Max (mg/L)	Delta DO Avg (mg/L)	DO Sat Max (%)	pH Max (SU)	Count Algal Obsv.	Dense/V. Dense Film/Fila. Algae
W2925	2018	--	--	--	--	--	--	--	--	2	0
W2926	2018	--	--	--	--	--	--	--	--	3	0

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Dunhams Brook (MA95-73); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
MassDEP staff conducted monitoring as part of the Bacteria Source Tracking (BST) project at three sites along Dunhams Brook during the summer of 2018 from up to downstream as follows: on Main Rd in Westport (W2925, n=2), ~1700 ft downstream from Main Rd just downstream of the confluence of an unnamed brook flowing from the north in Westport (W2923, n=1), and at the unnamed road west off the Main Rd and Taber Lane intersection ~250 ft upstream of the confluence with West Branch Westport River in Westport (W2926, n=4). There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews at any of the sites. The Aesthetics Use for Dunhams Brook (MA95-73) is assessed as Fully Supporting based on the general lack of any objectionable conditions noted at any of the three sites surveyed by MassDEP staff along the brook during the summer of 2018.	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2923	MassDEP	Water Quality	Dunhams Brook	[approximately 1700 feet downstream from Main Road, just downstream of confluence of unnamed brook flowing from the north, Westport]	41.539679	-71.091190
W2925	MassDEP	Water Quality	Dunhams Brook	[Main Road, Westport]	41.541200	-71.085850
W2926	MassDEP	Water Quality	Dunhams Brook	[unnamed road west off the Main Road and Taber Lane intersection, approximately 250 feet upstream of confluence with West Branch Westport River, Westport]	41.536670	-71.091484

*Aesthetic Observations***Aesthetics Summary Statements for MassDEP Stations (2011-2018)** (MassDEP Undated6)

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W2923	Dunhams Brook	2018	1	MassDEP aesthetics observations for station W2923 on Dunhams Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2018. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=1).
W2925	Dunhams Brook	2018	2	MassDEP aesthetics observations for station W2925 on Dunhams Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2018. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2).
W2926	Dunhams Brook	2018	4	MassDEP aesthetics observations for station W2926 on Dunhams Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2018.

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W2923	2018	1	0	0
W2925	2018	2	2	0
W2926	2018	4	3	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W2923	Dunhams Brook	2018	Color	Brownish	1	1
W2923	Dunhams Brook	2018	Objectionable Deposits	NA	1	1

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W2923	Dunhams Brook	2018	Odor	None	1	1
W2923	Dunhams Brook	2018	Scum	NA	1	1
W2923	Dunhams Brook	2018	Turbidity	Moderately Turbid	1	1
W2925	Dunhams Brook	2018	Color	Light Yellow/Tan	1	2
W2925	Dunhams Brook	2018	Color	None	1	2
W2925	Dunhams Brook	2018	Objectionable Deposits	NA	2	2
W2925	Dunhams Brook	2018	Odor	None	2	2
W2925	Dunhams Brook	2018	Scum	NA	2	2
W2925	Dunhams Brook	2018	Turbidity	Slightly Turbid	2	2
W2926	Dunhams Brook	2018	Color	Brownish	1	4
W2926	Dunhams Brook	2018	Color	Light Yellow/Tan	1	4
W2926	Dunhams Brook	2018	Color	None	2	4
W2926	Dunhams Brook	2018	Objectionable Deposits	NA	4	4
W2926	Dunhams Brook	2018	Odor	None	4	4
W2926	Dunhams Brook	2018	Scum	NA	4	4
W2926	Dunhams Brook	2018	Turbidity	Slightly Turbid	4	4

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff collected bacteria samples (for the MassDEP Bacteria Source Tracking (BST) project) at this Dunhams Brook AU (MA95-73) in Westport, from upstream to downstream as follows: on Main Rd (W2925) between June and July 2018 (<i>E. coli</i> n=2) and in August 2018 (<i>Enterococci</i> n=1), ~1700 ft downstream from Main Rd (W2923) in May 2018 (<i>E. coli</i> n=1), and at the unnamed road west of the Main Rd and Taber Lane intersection ~250 ft upstream of the confluence with the West Branch Westport River (W2926) between May and October 2018 (<i>E. coli</i> n=4). The available bacteria data at W2925 and W2923 are too limited to assess the Primary Contact Recreational Use according to the CALM "Use Attainment Impairment Decision Schema", though it should be noted that all samples at W2925 exceeded the 410 and 130 cfu/100ml STV's for <i>E. coli</i> and <i>Enterococci</i>, respectively. Analysis of the single years' worth of limited frequency <i>E. coli</i> data at (W2926) indicated that 100% of the intervals had GM's >126 cfu/100 ml, one sample exceeded the 410 cfu/100 ml STV, with a seasonal GM of 317 cfu/100 ml. BST human marker analysis was run at W2925 and results indicated "inconclusive evidence" of a human sewage source; all of the Bacteroidetes markers were present, which can also be indicative of a wildlife source, in particular birds, but also cat fecal matter. In combination with the low detergent results at this location, all evidence pointed to a significant wildlife source of bacteria, coming from the wetland area just upstream of Main Rd.</p> <p>Since the <i>E. coli</i> data at site W2926 in Dunhams Brook in 2018 exceeded the use attainment impairment thresholds, the Primary Contact Recreational Use for Dunhams Brook (MA95-73) is assessed as Not Supporting. An <i>Escherichia Coli</i> (<i>E. Coli</i>) impairment is being added.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2923	MassDEP	Water Quality	Dunhams Brook	[approximately 1700 feet downstream from Main Road, just downstream of confluence of unnamed brook flowing from the north, Westport]	41.539679	-71.091190
W2925	MassDEP	Water Quality	Dunhams Brook	[Main Road, Westport]	41.541200	-71.085850

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2926	MassDEP	Water Quality	Dunhams Brook	[unnamed road west off the Main Road and Taber Lane intersection, approximately 250 feet upstream of confluence with West Branch Westport River, Westport]	41.536670	-71.091484

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP

Undated11) (MassDEP Undated6)

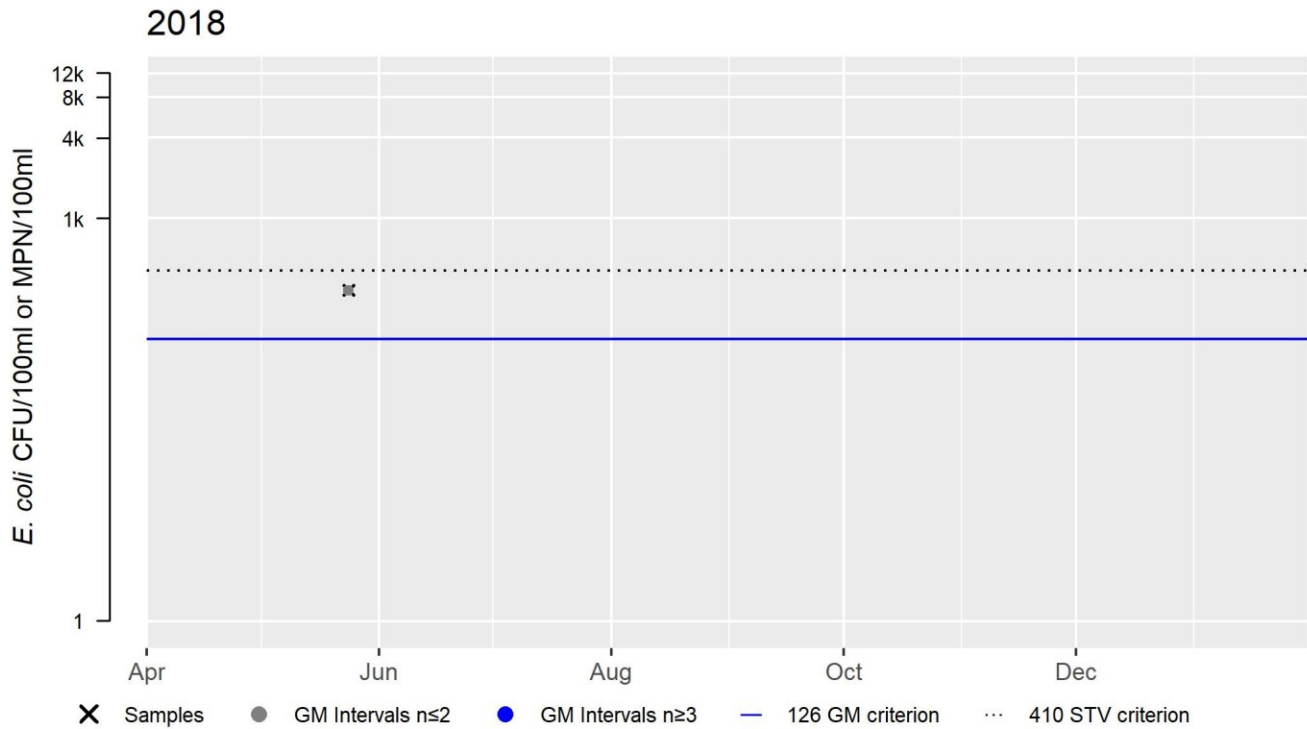
[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
W2923	MassDEP	E. coli	05/24/18	05/24/18	1	292	292	292
W2925	MassDEP	E. coli	06/11/18	07/11/18	2	1990	2420	2194
W2925	MassDEP	Enterococci	08/08/18	08/08/18	1	940	940	940
W2926	MassDEP	E. coli	05/24/18	10/11/18	4	211	727	317

W2923 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	1
SeasGM	292
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

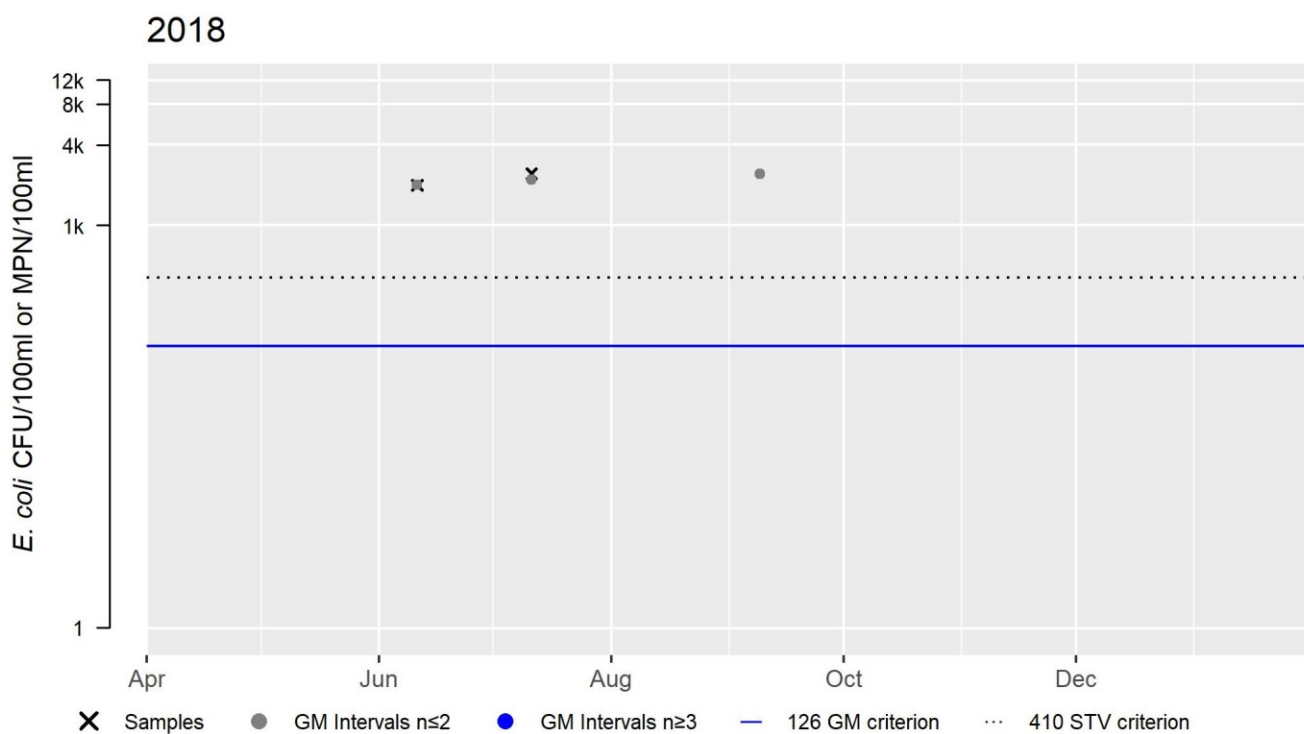
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2925 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	2194
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	2
%n>STV	100

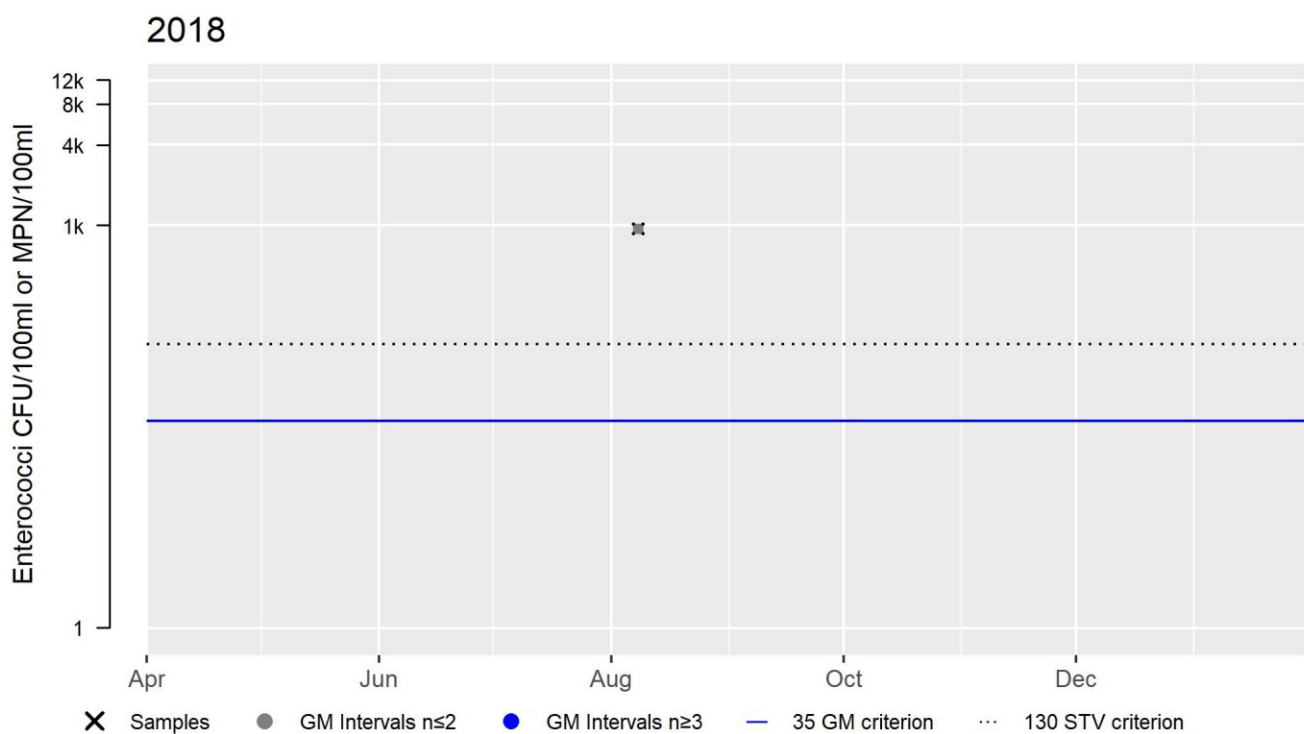
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2925 Enterococci (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	1
SeasGM	940
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	100

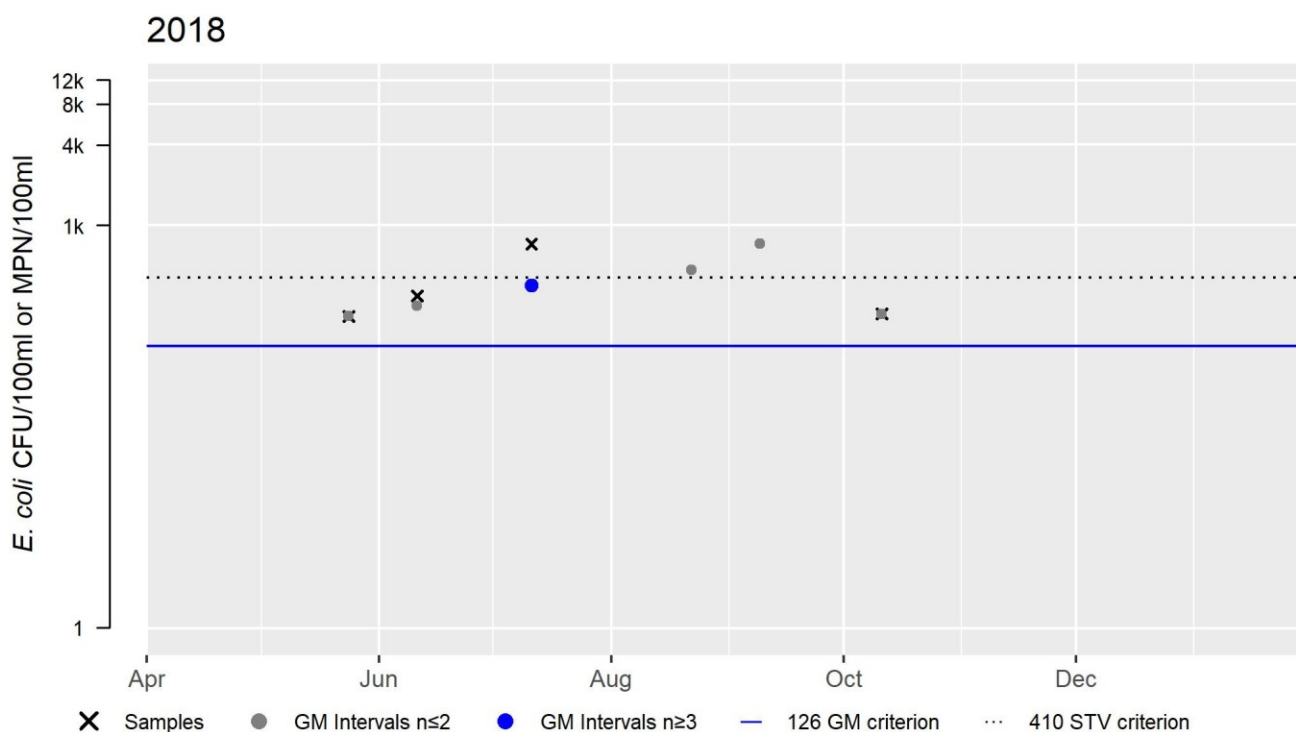
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2926 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	4
SeasGM	317
#GMI	1
#GMI Ex	1
%GMI Ex	100
n>STV	1
%n>STV	25

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019 (MassDEP Undated2)

Summary

BST work was conducted in 2018 at 6 sites on the Dunhams Brook AU (MA95-73), with *E. coli* concentrations ranging 185 to >2,418.6MPN. A hotspot was noted in the area of Main Rd, so consequently human marker analysis was run at this location. Results indicated "inconclusive evidence" of a human sewage source; all of the bacteroidetes markers were present, which can also be indicative of a wildlife source, in particular birds, but also cat fecal matter. In combination with the low detergent results at this location, all evidence pointed to a significant wildlife source of bacteria, coming from the wetland area just upstream of Main Rd. Additional BST work was conducted in 2018 on an unnamed tributary to Dunhams Brook; complaints from a local home owner were made regarding observations of sulphur odor and fungus in this tributary. WPP staff did also observe copious amounts of what looked like grey sewage fungus in this tributary, however *E. coli* concentrations were relatively low, ranging 10 to 186MPN. Investigations in the headwaters of the unnamed tributary near Cornell Rd discovered some evidence of an agricultural source of nutrients. The Town of Westport was left to work with local farmers on this matter.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	
<p>MassDEP staff collected <i>E. coli</i> bacteria samples (for the MassDEP Bacteria Source Tracking (BST) project) in Dunhams Brook (MA95-73) in Westport, from upstream to downstream as follows: on Main Rd (W2925) between June and July 2018 (n=2), ~1700 ft downstream from Main Rd (W2923) in May 2018 (n=1), and at the unnamed road west of the Main Rd and Taber Lane intersection ~250 ft upstream of the confluence with the West Branch Westport River (W2926) between May and October 2018 (n=4). The available bacteria data at W2925 and W2923 are too limited to assess the Secondary Contact Recreational Use according to the CALM "Use Attainment Impairment Decision Schema", though it should be noted that both samples at W2925 exceeded the 1260 cfu/100ml STV, with a seasonal GM of 2194 cfu/100ml. Analysis of the single years' worth of limited frequency data at (W2926), however, indicated that none of the intervals had GM's > 630 cfu/100 ml, no samples exceeded the 1260 cfu/100 ml STV, with a seasonal GM of 317 cfu/100 ml. BST human marker analysis was run at W2925 and results indicated "inconclusive evidence" of a human sewage source; all of the bacteroidetes markers were present, which can also be indicative of a wildlife source, in particular birds, but also cat fecal matter. In combination with the low detergent results at this location, all evidence pointed to a significant wildlife source of bacteria, coming from the wetland area just upstream of Main Rd.</p> <p>Since the <i>E. coli</i> data at site W2926 in 2018 did not exceed the use attainment impairment thresholds, the Secondary Contact Recreational Use for Dunhams Brook (MA95-73) is assessed as Fully Supporting. An Alert is being identified due to the elevated <i>E. coli</i> concentrations documented at Main Rd Westport in 2018 however.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2923	MassDEP	Water Quality	Dunhams Brook	[approximately 1700 feet downstream from Main Road, just downstream of confluence of unnamed brook flowing from the north, Westport]	41.539679	-71.091190
W2925	MassDEP	Water Quality	Dunhams Brook	[Main Road, Westport]	41.541200	-71.085850
W2926	MassDEP	Water Quality	Dunhams Brook	[unnamed road west off the Main Road and Taber Lane intersection, approximately 250 feet upstream of confluence with West Branch Westport River, Westport]	41.536670	-71.091484

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP Undated11) (MassDEP Undated6)

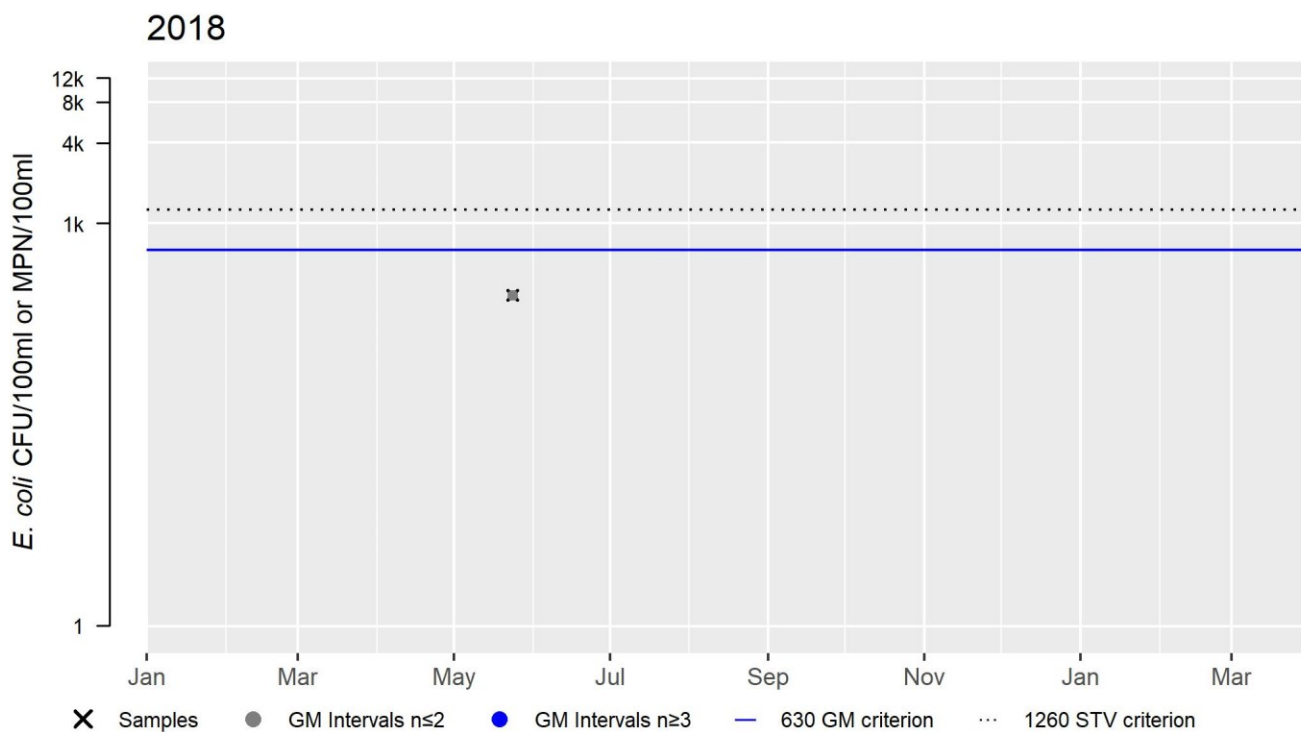
[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
W2923	MassDEP	E. coli	05/24/18	05/24/18	1	292	292	292
W2925	MassDEP	E. coli	06/11/18	07/11/18	2	1990	2420	2194
W2926	MassDEP	E. coli	05/24/18	10/11/18	4	211	727	317

W2923 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	1
SeasGM	292
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

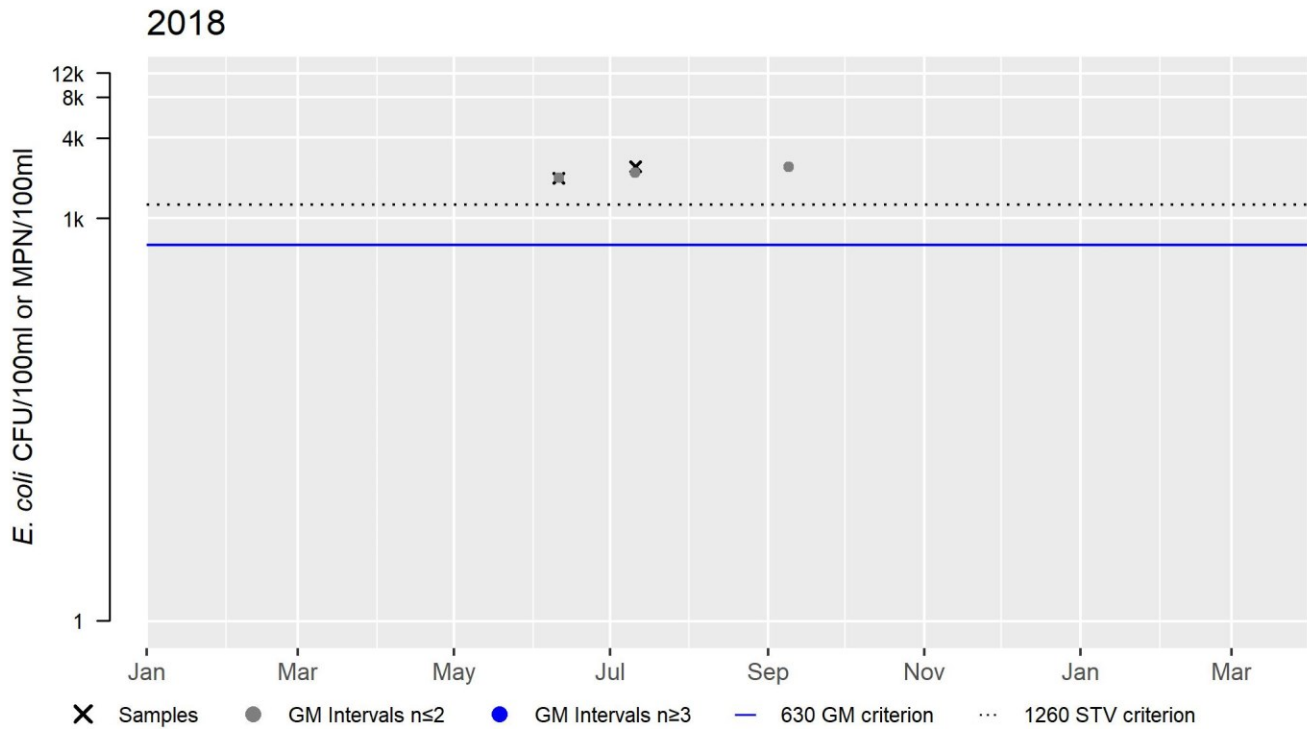
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2925 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	2194
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	2
%n>STV	100

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

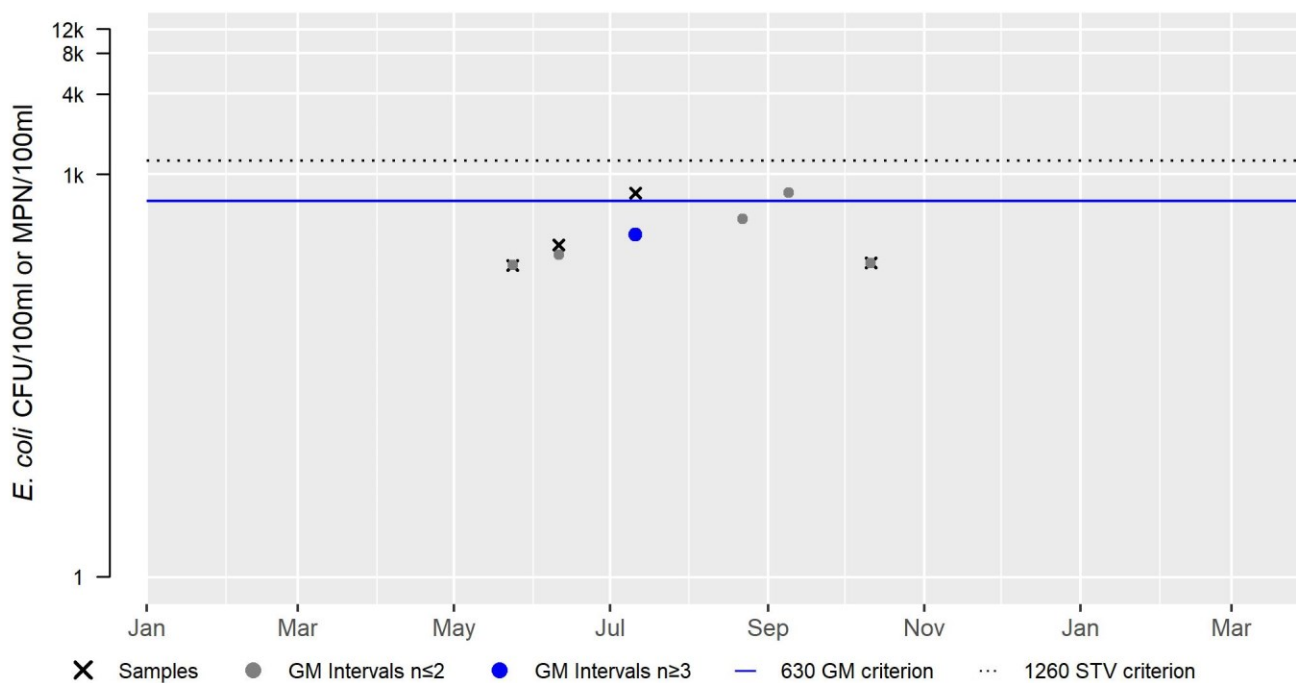


W2926 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	4
SeasGM	317
#GMI	1
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2018

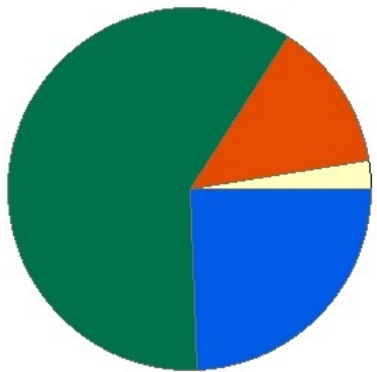


East Branch Westport River (MA95-40)

Location:	Headwaters, outlet Noquochoke Lake, Dartmouth to Old County Road bridge, Westport (mileage includes length of braid).
AU Type:	RIVER
AU Size:	2.4 MILES
Classification/Qualifier:	B: WWF, HQW

East Branch Westport River - MA95-40

Watershed Area: 40.32 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	40.32	11.76	14.12	4.32
Agriculture	2.5%	2.2%	2.5%	1.2%
Developed	13.4%	22%	9.1%	15.5%
Natural	59.8%	48.7%	50.9%	48%
Wetland	24.3%	27.1%	37.5%	35.3%
Impervious Cover	5.6%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	5	(Fish Passage Barrier*)		Added
4a	5	Dissolved Oxygen		Added
4a	5	Enterococcus	36170	Unchanged
4a	5	Fecal Coliform	36170	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Hydrostructure Impacts on Fish Passage (Y)	X				
Dissolved Oxygen	Source Unknown (N)	X				
Enterococcus	Source Unknown (N)				X	
Fecal Coliform	Source Unknown (N)				X	

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
<p>DMF biologists note two structures causing passage limitation to diadromous fish on this East Branch Westport River AU (MA95-40). From upstream to downstream: The Noquochoke Lake Dam (NATID# MA01085), just upstream of Rt.6 in Westport was given a passage score of "10", on a 0-10 scale, indicating that the dam allows no possible passage of the targeted species, river herring and American eel. DMF biologists note that the road infrastructure at this location would create difficulties in constructing a fishway. The Forge Pond Dam (NATID# MA03093) located roughly in the middle of this AU, was given a passage score of "4" on a 0-10 scale, indicating that the dam restricts the passage of the targeted species, river herring and American eel. Population scores of "4" were given for both structures. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at one location (incorporating two separate station IDs) in the summers of 2015-2019, at the downstream end of this East Branch Westport River AU at Old County Rd (BBC_101E and N0). Monitoring was conducted in the surface waters, as well as deeper in the water column (depth of ~0.5m) and was usually conducted weekly in the summer months (between 6 & 9am). The maximum temperature was 30°C (>28.3°C just once, n=79). The minimum dissolved oxygen (DO) was 3.0mg/L (n=66), <5.0mg/L twice between May and July (when anadromous fish early life stages are potentially present) <4.0mg/L eight times at depth (i.e., ~0.5m). Total phosphorus sampling (n=19, maximum 0.051mg/L in July and August) documented generally low seasonal average total phosphorus concentrations (0.012-0.032mg/L). The maximum chlorophyll <i>a</i> was 35.17µg/L (n=19), >16µg/L three times (once each year in 2015, 2016, and 2017). Secchi disk measurements ranged from 0.3 to 0.9m (n=35). Ammonia-nitrogen concentrations were generally low (range 0.009 to 0.118mg/L (n=19)), though TU's could not be calculated (lack of quality assured pH and salinity data).</p> <p>The Aquatic Life Use for this East Branch Westport River AU (MA95-40) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Noquochoke Lake and Forge Pond Dams and the low dissolved oxygen documented at Old County Road (at a depth of 0.5m) by BBC staff/volunteers in 2016-2019. An Alert for elevated chlorophyll <i>a</i> is being identified.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_101E	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Fresh, Westport	41.621007	-71.059772
BBC_N0	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Fresh, Westport	41.621049	-71.059734

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary

DMF biologists note two structures causing passage limitation to diadromous fish throughout this East Branch Westport River AU. From upstream to downstream: The Noquochoke Lake Dam (NATID# MA01085), just upstream of Rt.6 in Westport was given a passage score of "10", on a 0-10 scale, indicating that the dam allows no possible passage of the targeted species, river herring and American eel, with a population score of "4". DMF biologists note that the road infrastructure at this location would create difficulties in constructing a fishway. The Forge Pond Dam (NATID# MA03093) located roughly in the middle of the AU, was given a passage score of "4" on a 0-10 scale, indicating that the dam restricts the passage of the targeted species, river herring and American eel, with a population score of "4". The Aquatic Life Use for East Branch Westport River (Assessment Unit MA95-40) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Noquochoke Lake and Forge Pond Dams.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Freshwater Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Average Sample depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
BBC_101E	06/04/15	09/23/15	0.1	4	6.0	6.9	0	0	0
BBC_101E	05/28/15	09/14/15	0.5	12	5.0	7.3	0	0	0
BBC_101E	07/11/16	07/11/16	0.1	1	4.0	4.0	1	1	0
BBC_101E	05/31/16	08/30/16	0.5	10	3.0	5.0	4	1	3
BBC_101E	08/31/17	08/31/17	0.2	1	5.0	5.0	0	0	0
BBC_101E	05/31/17	09/06/17	0.5	9	3.0	5.8	2	0	1
BBC_101E	05/30/18	07/20/18	0.2	5	5.0	5.7	0	0	0
BBC_101E	06/06/18	09/19/18	0.5	10	3.0	5.2	3	0	3
BBC_101E	08/01/19	08/17/19	0.2	2	6.0	6.8	0	0	0
BBC_101E	05/30/19	09/09/19	0.5	12	3.0	5.9	1	0	1

Buzzards Bay Coalition Discrete Freshwater Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_101E	06/04/15	09/23/15	0.1	4	3	20.0	19.3	0	0	0	0
BBC_101E	05/28/15	09/14/15	0.5	12	11	28.0	20.5	4	2	0	0
BBC_101E	07/11/16	07/11/16	0.1	1	1	20.0	20.0	0	0	0	0
BBC_101E	05/31/16	08/30/16	0.5	10	9	28.0	22.3	5	4	0	0
BBC_101E	08/31/17	08/31/17	0.2	1	1	23.0	23.0	1	1	0	0
BBC_101E	05/31/17	09/06/17	0.5	9	8	23.2	21.4	6	2	0	0
BBC_101E	05/30/18	07/20/18	0.2	5	4	22.0	20.5	1	0	0	0
BBC_101E	06/06/18	09/19/18	0.5	11	10	25.0	20.8	5	3	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_101E	08/01/19	08/17/19	0.2	2	2	21.0	21.0	2	0	0	0
BBC_101E	05/30/19	09/09/19	0.5	12	11	22.0	18.8	4	0	0	0
BBC_NO	07/13/15	08/25/15	0.2	4	4	27.0	24.3	4	4	0	0
BBC_NO	07/05/16	08/15/16	0.2	4	4	30.0	27.5	4	4	1	0
BBC_NO	07/06/17	08/17/17	0.2	3	3	26.0	24.6	3	2	0	0
BBC_NO	07/10/18	08/21/18	0.2	4	4	26.0	22.3	3	1	0	0
BBC_NO	07/11/19	08/15/19	0.2	4	4	24.2	23.1	4	3	0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Freshwater Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	DO Sat Max (%)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count >16µg/L
BBC_NO	2015	0.2	4	0.008	0.051	0.032	--	4	1.48	21.47	8.32	1
BBC_NO	2016	0.2	4	0.008	0.015	0.012	--	4	1.78	18.07	7.98	1
BBC_NO	2017	0.2	3	0.015	0.015	0.015	--	3	1.79	35.17	13.23	1
BBC_NO	2018	0.2	4	0.010	0.015	0.014	--	4	1.88	9.79	4.22	0
BBC_NO	2019	0.2	4	0.009	0.021	0.013	--	4	0.61	1.52	1.06	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_101E	06/15/15	09/10/15	7	0.6	0.8	0.7
BBC_101E	05/31/16	08/30/16	7	0.5	0.6	0.6
BBC_101E	06/21/17	08/17/17	4	0.5	0.9	0.7
BBC_101E	08/07/18	08/21/18	3	0.7	0.7	0.7
BBC_101E	05/30/19	09/09/19	7	0.4	0.6	0.6
BBC_NO	07/27/15	08/10/15	2	0.4	0.5	0.5
BBC_NO	08/03/17	08/03/17	1	0.3	0.3	0.3
BBC_NO	08/07/18	08/07/18	1	0.5	0.5	0.5
BBC_NO	07/11/19	08/15/19	3	0.4	0.5	0.5

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_NO	07/13/15	08/25/15	0.2	4	0.033	0.118	0.059
BBC_NO	07/05/16	08/15/16	0.2	4	0.020	0.050	0.035
BBC_NO	07/06/17	08/17/17	0.2	3	0.009	0.038	0.025
BBC_NO	07/10/18	08/21/18	0.2	4	0.012	0.034	0.020
BBC_NO	07/11/19	08/15/19	0.2	4	0.022	0.041	0.031

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this East Branch Westport River AU (MA95-40); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this East Branch Westport River AU (MA95-40) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E. coli</i> bacteria data are available to assess the status of the Primary Contact Recreation Use for this East Branch Westport River AU (MA95-40) so it will continue to be assessed as Not Supporting with the <i>Enterococcus</i> and Fecal Coliform impairments being carried forward.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E. coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for this East Branch Westport River (MA95-40) so it is Not Assessed.	

East Branch Westport River (MA95-41)

Location:	Old County Road bridge, Westport to the mouth at Westport Harbor/Westport River, Westport (excluding Horseneck Channel).
AU Type:	ESTUARY
AU Size:	2.65 SQUARE MILES
Classification/Qualifier:	SB: SFR, HQW

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	4a	Estuarine Bioassessments	67640	Changed
5	4a	Fecal Coliform	36171	Unchanged
5	4a	Nitrogen, Total	67640	Changed
5	4a	Nutrient/Eutrophication Biological Indicators	67640	Changed

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Agriculture (Y)	X					
Estuarine Bioassessments	Impervious Surface/Parking Lot Runoff (Y)	X					
Estuarine Bioassessments	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Fecal Coliform	Animal Feeding Operations (NPS) (Y)			X		X	X
Fecal Coliform	Dairies (Y)			X		X	X
Fecal Coliform	Discharges from Municipal Separate Storm Sewer Systems (MS4) (Y)			X		X	X
Fecal Coliform	Grazing in Riparian or Shoreline Zones (Y)			X		X	X
Nitrogen, Total	Agriculture (Y)	X					
Nitrogen, Total	Impervious Surface/Parking Lot Runoff (Y)	X					
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nutrient/Eutrophication Biological Indicators	Agriculture (Y)	X					
Nutrient/Eutrophication Biological Indicators	Impervious Surface/Parking Lot Runoff (Y)	X					
Nutrient/Eutrophication Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Estuarine Bioassessments	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Westport River Estuarine System TMDLs for Nitrogen (Total) (Report CN 375.1, approved 2017-05-04, ATTAINS Action ID: 67640)
Nitrogen, Total	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Westport River Estuarine System TMDLs for Nitrogen (Total) (Report CN 375.1, approved 2017-05-04, ATTAINS Action ID: 67640)
Nutrient/Eutrophication Biological Indicators	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Westport River Estuarine System TMDLs for Nitrogen (Total) (Report CN 375.1, approved 2017-05-04, ATTAINS Action ID: 67640)

Recommendations

2022 Recommendations
ALU: Conduct DO monitoring throughout the water column in the open waters (away from shore), to better evaluate the nature and extent of possible low DO impairments for this East Branch Westport River AU (MA95-41).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented a ~30% loss of eelgrass bed habitat in this East Branch Westport River AU in Westport (MA95-41) between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at 14 locations throughout the AU (in reaches referred to as upper, inner, and outer) in the summers of 2015-2019, from upstream to downstream as follows: upstream half of the AU (BBC Upper reach six sites) BBC_N1 (just downstream of Kirby Bk), BBC_N2 (off Cornell Pt.), BBC_N3 (just downstream of Snells Creek and Jessies Neck), BBC_N4 (off Doctors Pt.), BBC_103E (off boat ramp just downstream of Hix Bridge), and BBC_E69 (by Lakes Island), and in the downstream half of the AU (BBC Inner reach five sites) BBC_104E (off a dock at Cadman Neck), BBC_106E (east bank, from a dock at Cummings Lane), BBC_E56 (east side, just upstream of Upper Spectacle Island), BBC_E33 (mid-stream near Gt. Island), and BBC_E41 (mid-stream near Gunning Island), and lastly (BBC Outer reach area just west of Big Ram Island, three sites) BBC_107E and 107EA (from docks on the west bank), and BBC_E30 (mid-stream). Monitoring was conducted in the surface waters at all stations, as well as deeper in the water column at six sites (depths ~0.5-2.6m). Temperature monitoring was usually conducted weekly at all stations in the summer months (between the hours of 6 & 9am). The maximum temperature was 30°C (n=572); >29.4°C nine times (at eight sites on 8/15/2016 and once at BBC_104E on 8/1/19). Dissolved oxygen was usually monitored weekly at three sites (BBC_103E, 104E, and 106E) though only in more recent years (2018/2019) at BBC_107E and 107EA. The minimum dissolved oxygen (DO) was 3.0mg/L (n=440); measurements below the criterion (<5.0mg/L) 11% overall while measurements <4.0mg/L were rare (occurring just at BBC_103E in 2018 at surface average depth of 1.2m for 19% and 23% of measurements, respectively). Total nitrogen sampling (n=182, maximum 1.99mg/L at BBC_N1) during ebb tides in June through September at 10 sampling sites documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.36-1.18mg/L which frequently (44 of 50 times) exceeded the TMDL threshold target of 0.49mg/l to protect high aquatic habitat quality in East Branch Westport River (MassDEP 2017). Chlorophyll *a* (n=200) was also often elevated especially in the upstream half of the AU (maximum 61.44µg/L in 2015 at BBC_N1); >5µg/L 104 times and >10µg/L at least once or twice a year (36 times or 18% overall). Secchi disk depths throughout the AU, usually weekly in the summers of 2015-2019 ranged from 0.3 to 3.4m (n=278) with yearly averages for sites with at least two measurements ranging from 0.6 to 2.3m. Ammonia-nitrogen concentrations were elevated at times (range 0.004 to 0.24mg/L, n=200), however TUs for ammonia-nitrogen could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for East Branch Westport River (MA95-41) will continue to be assessed as Not Supporting based on the loss of eelgrass bed habitat documented by the MassDEP between 1995 and 2017 and the water quality data collected throughout the AU by the BBC staff/volunteers in 2015-2019. The Estuarine Bioassessments, Total Nitrogen, and Nutrient/Eutrophication Biological Indicators impairments are all being carried forward. An Alert is being identified for low DO in the upper half of the AU based on data collected by BBC at three nearshore stations. and a recommendation will be made to collect additional DO data.

Monitoring Stations

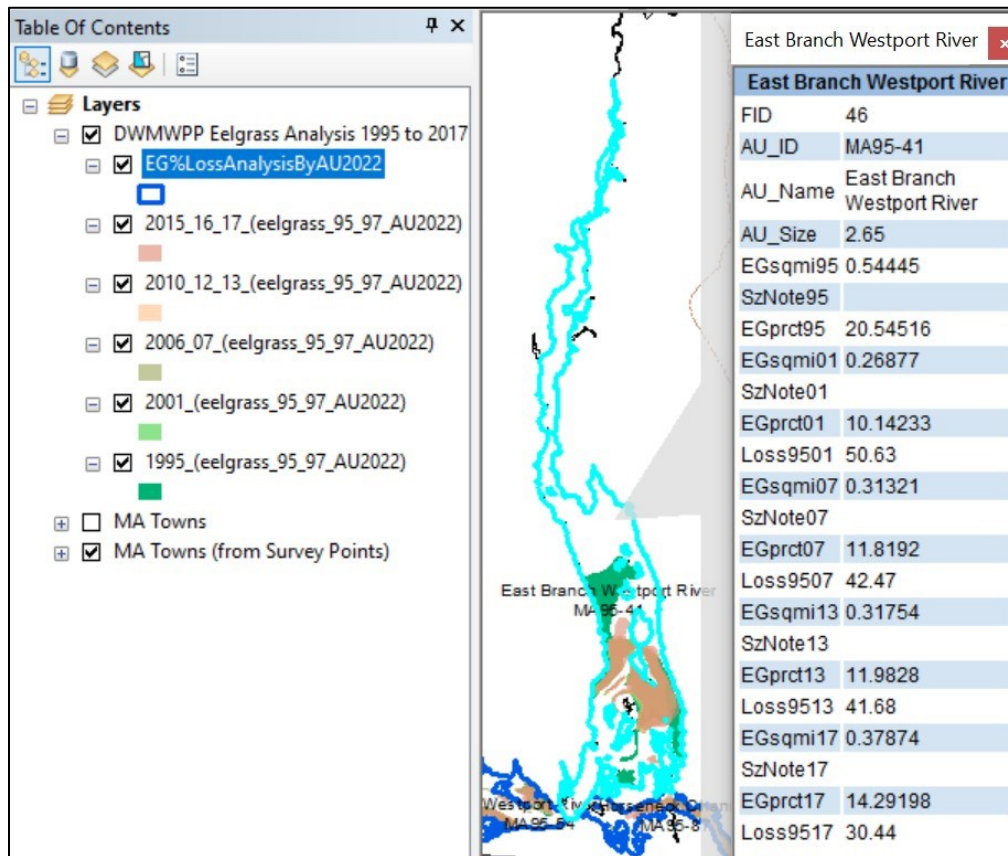
Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_103E	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Upper, Westport	41.569858	-71.071216
BBC_104E	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Inner, Westport	41.558969	-71.064063
BBC_106E	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Inner, Westport	41.556765	-71.055995
BBC_107E	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Outer, Westport	41.523097	-71.065944
BBC_107EA	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Outer, Westport	41.520596	-71.066975
BBC_E30	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Outer, Westport	41.520447	-71.065131
BBC_E33	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Inner, Westport	41.54363	-71.05974

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_E41	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Inner, Westport	41.534193	-71.055323
BBC_E56	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Inner, Westport	41.554533	-71.057051
BBC_E69	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Inner, Westport	41.561934	-71.073583
BBC_N1	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Upper, Westport	41.595589	-71.066481
BBC_N2	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Upper, Westport	41.587717	-71.070316
BBC_N3	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Upper, Westport	41.579965	-71.072034
BBC_N4	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Upper, Westport	41.573925	-71.071982

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for the East Branch Westport River MA95-41 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~30% loss of eelgrass bed habitat in this East Branch Westport River AU (MA95-41) between 1995 and 2017.

*Physico-chemical Water Quality Information***DO, pH, Temperature****Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_103E	05/27/15	09/23/15	0.2	19	5.0	6.9	11	0	0
BBC_103E	05/27/15	09/23/15	1.1	19	5.0	6.9	5	0	0
BBC_103E	05/31/16	09/24/16	0.2	20	4.5	5.8	35	5	0
BBC_103E	05/31/16	09/24/16	1.3	20	4.5	6.0	25	5	0
BBC_103E	05/31/17	09/20/17	0.2	21	4.0	5.5	57	14	0
BBC_103E	05/31/17	09/20/17	1.3	21	4.5	5.4	71	19	0
BBC_103E	05/29/18	09/15/18	0.2	21	3.0	4.6	86	52	19
BBC_103E	05/29/18	09/19/18	1.2	22	3.0	4.6	86	55	23
BBC_103E	06/14/19	07/17/19	0.2	3	5.5	6.2	33	0	0
BBC_103E	05/30/19	09/23/19	1.2	21	5.0	7.2	10	0	0
BBC_104E	06/04/15	09/23/15	0.7	21	5.0	6.3	14	0	0
BBC_104E	05/31/16	09/23/16	0.7	21	4.0	5.1	67	29	0
BBC_104E	05/31/17	09/20/17	0.8	21	5.0	5.9	33	0	0
BBC_104E	05/31/18	09/19/18	0.8	21	5.0	6.3	14	0	0
BBC_104E	07/02/19	09/10/19	0.2	5	5.5	7.8	20	0	0
BBC_104E	05/30/19	09/23/19	0.8	15	5.0	7.6	13	0	0
BBC_106E	06/29/15	12/09/15	0.2	3	6.8	8.2	0	0	0
BBC_106E	05/28/15	09/23/15	0.5	22	5.0	7.3	18	0	0
BBC_106E	01/06/16	06/15/16	0.1	2	7.4	11.0	0	0	0
BBC_106E	05/31/16	09/24/16	0.7	22	4.0	5.9	50	32	0
BBC_106E	03/08/17	08/08/17	0.2	2	5.0	9.5	50	0	0
BBC_106E	06/01/17	09/16/17	0.6	17	4.0	5.4	82	12	0
BBC_106E	06/17/18	09/11/18	0.2	3	5.0	5.5	67	0	0
BBC_106E	05/29/18	09/18/18	0.6	20	5.0	6.0	40	0	0
BBC_106E	05/30/19	09/04/19	0.2	17	6.0	7.0	0	0	0
BBC_106E	06/04/19	09/04/19	0.8	16	5.5	6.8	13	0	0
BBC_107E	07/07/19	07/15/19	0.5	2	7.5	7.8	0	0	0
BBC_107EA	06/27/18	08/21/18	0.2	3	6.0	6.5	0	0	0
BBC_107EA	05/30/18	09/19/18	0.7	16	5.0	7.1	13	0	0
BBC_107EA	09/03/19	09/22/19	0.6	4	5.0	7.0	25	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_103E	05/27/15	09/23/15	0.2	19	16	27.0	23.5	0
BBC_103E	05/27/15	09/23/15	1.1	19	16	27.0	24.0	0
BBC_103E	05/31/16	09/24/16	0.2	20	16	28.0	24.0	0
BBC_103E	05/31/16	09/24/16	1.3	20	16	28.0	24.2	0
BBC_103E	05/31/17	09/20/17	0.2	21	18	27.2	22.1	0
BBC_103E	05/31/17	09/20/17	1.3	21	18	27.0	22.2	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_103E	05/29/18	09/15/18	0.2	21	20	27.4	23.1	0
BBC_103E	05/29/18	09/19/18	1.2	22	20	27.4	23.2	0
BBC_103E	06/14/19	07/17/19	0.2	3	3	26.0	23.3	0
BBC_103E	05/30/19	09/23/19	1.2	22	19	28.0	23.3	0
BBC_104E	06/04/15	09/23/15	0.7	21	19	27.0	23.6	0
BBC_104E	05/31/16	09/23/16	0.7	21	17	29.0	24.6	0
BBC_104E	05/31/17	09/20/17	0.7	21	18	27.0	21.9	0
BBC_104E	05/31/18	09/19/18	0.7	21	19	25.0	21.4	0
BBC_104E	06/20/19	09/10/19	0.2	6	6	25.0	22.9	0
BBC_104E	05/30/19	09/23/19	0.8	14	11	30.0	24.5	1
BBC_106E	06/16/15	12/09/15	0.2	7	3	25.0	22.2	0
BBC_106E	05/28/15	09/23/15	0.6	22	19	27.0	22.7	0
BBC_106E	01/06/16	09/26/16	0.2	9	3	24.0	22.5	0
BBC_106E	05/31/16	09/24/16	0.7	22	18	28.0	23.4	0
BBC_106E	03/08/17	09/19/17	0.2	6	4	22.3	19.7	0
BBC_106E	06/01/17	09/16/17	0.6	17	16	25.3	21.7	0
BBC_106E	06/17/18	09/11/18	0.2	3	3	21.8	20.7	0
BBC_106E	05/29/18	09/18/18	0.6	20	18	26.8	23.6	0
BBC_106E	05/30/19	09/04/19	0.2	17	16	26.0	23.0	0
BBC_106E	06/04/19	09/04/19	0.8	16	16	26.0	23.0	0
BBC_107E	07/07/19	07/26/19	0.5	4	4	25.0	24.3	0
BBC_107EA	06/27/18	08/21/18	0.2	3	3	22.5	20.7	0
BBC_107EA	05/30/18	09/19/18	0.7	15	13	22.5	20.3	0
BBC_107EA	09/03/19	09/22/19	0.6	4	3	22.0	20.7	0
BBC_E30	07/13/15	08/25/15	0.2	4	4	29.0	25.5	0
BBC_E30	07/05/16	08/15/16	0.2	4	4	28.0	24.5	0
BBC_E30	07/06/17	08/17/17	0.2	3	3	24.8	23.9	0
BBC_E30	07/10/18	08/21/18	0.2	4	4	27.0	24.4	0
BBC_E30	07/11/19	08/15/19	0.2	4	4	24.0	23.6	0
BBC_E33	07/13/15	08/25/15	0.2	4	4	29.0	26.0	0
BBC_E33	07/05/16	08/15/16	0.2	4	4	30.0	26.5	1
BBC_E33	07/06/17	08/17/17	0.2	3	3	26.0	25.2	0
BBC_E33	07/10/18	08/21/18	0.2	4	4	27.1	24.8	0
BBC_E33	07/11/19	08/15/19	0.2	4	4	25.7	24.4	0
BBC_E41	07/13/15	08/25/15	0.2	4	4	28.0	26.0	0
BBC_E41	07/05/16	08/15/16	0.2	4	4	28.0	25.0	0
BBC_E41	07/06/17	08/17/17	0.2	3	3	25.3	24.4	0
BBC_E41	07/10/18	08/21/18	0.2	4	4	26.9	24.6	0
BBC_E41	07/11/19	08/15/19	0.2	4	4	24.9	23.9	0
BBC_E56	07/13/15	08/25/15	0.2	4	4	28.0	25.8	0
BBC_E56	07/05/16	08/15/16	0.2	4	4	30.0	27.0	1
BBC_E56	07/06/17	08/17/17	0.2	3	3	26.0	25.3	0
BBC_E56	07/10/18	08/21/18	0.2	4	4	27.5	25.3	0
BBC_E56	07/11/19	08/15/19	0.2	4	4	25.9	24.5	0
BBC_E69	07/13/15	08/25/15	0.2	4	4	29.0	26.3	0
BBC_E69	07/13/15	08/25/15	2.6	4	4	29.0	26.0	0
BBC_E69	07/05/16	08/15/16	0.2	4	4	30.0	27.5	1
BBC_E69	07/05/16	08/15/16	2.1	4	4	30.0	27.5	1
BBC_E69	07/06/17	08/17/17	0.2	3	3	26.2	25.7	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_E69	07/06/17	08/17/17	1.5	3	3	26.1	25.6	0
BBC_E69	07/10/18	08/21/18	0.2	4	4	28.1	25.5	0
BBC_E69	07/10/18	08/21/18	2.1	4	4	27.8	25.6	0
BBC_E69	07/11/19	08/15/19	0.2	4	4	26.5	24.7	0
BBC_N1	07/13/15	08/25/15	0.2	4	4	29.0	25.3	0
BBC_N1	07/05/16	08/15/16	0.2	4	4	30.0	27.3	1
BBC_N1	07/06/17	08/17/17	0.2	3	3	26.0	25.1	0
BBC_N1	07/10/18	08/21/18	0.2	4	4	27.8	25.5	0
BBC_N1	07/11/19	08/15/19	0.2	2	2	26.6	25.9	0
BBC_N2	07/13/15	08/25/15	0.2	4	4	29.0	25.5	0
BBC_N2	07/05/16	08/15/16	0.2	4	4	30.0	27.3	1
BBC_N2	07/06/17	08/17/17	0.2	3	3	26.0	25.4	0
BBC_N2	07/10/18	08/21/18	0.2	4	4	27.5	25.5	0
BBC_N2	07/11/19	08/15/19	0.2	2	2	26.4	25.8	0
BBC_N3	07/13/15	08/25/15	0.2	4	4	28.0	25.8	0
BBC_N3	07/05/16	08/15/16	0.2	4	4	30.0	27.5	1
BBC_N3	07/06/17	08/17/17	0.2	3	3	26.0	25.2	0
BBC_N3	07/10/18	08/21/18	0.2	4	4	27.7	25.7	0
BBC_N3	07/11/19	08/15/19	0.2	3	3	26.5	24.6	0
BBC_N4	07/13/15	08/25/15	0.2	4	4	28.0	25.8	0
BBC_N4	07/05/16	08/15/16	0.2	4	4	30.0	27.5	1
BBC_N4	07/06/17	08/17/17	0.2	3	3	26.0	25.4	0
BBC_N4	07/10/18	08/21/18	0.2	4	4	27.7	25.4	0
BBC_N4	07/11/19	08/15/19	0.2	4	4	26.4	24.5	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_106E	2015	0.2	4	0.45	0.73	0.53	7	1.34	9.28	4.71	4	0
BBC_106E	2016	0.1	4	0.31	0.59	0.47	7	2.49	8.66	4.90	4	0
BBC_106E	2017	0.2	4	0.34	0.67	0.52	5	1.98	4.72	3.24	5	0
BBC_E30	2015	0.2	4	0.40	0.42	0.41	4	2.31	6.28	3.89	3	0
BBC_E30	2016	0.2	4	0.34	0.58	0.43	4	1.55	4.18	2.25	4	0
BBC_E30	2017	0.2	3	0.36	0.68	0.53	3	2.75	8.29	5.27	2	0
BBC_E30	2018	0.2	4	0.31	0.38	0.36	4	1.72	5.11	3.63	3	0
BBC_E30	2019	0.2	4	0.30	0.71	0.42	4	1.15	5.40	2.99	3	0
BBC_E33	2015	0.2	4	0.48	0.86	0.61	4	4.29	13.63	7.97	1	1
BBC_E33	2016	0.2	3	0.45	0.57	0.51	4	1.94	6.42	3.86	3	0
BBC_E33	2017	0.2	3	0.46	0.75	0.61	3	4.30	9.16	6.02	2	0
BBC_E33	2018	0.2	4	0.41	0.56	0.51	4	2.94	6.09	4.31	3	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_E33	2019	0.2	3	0.43	0.90	0.61	4	0.48	7.54	3.94	2	0
BBC_E41	2015	0.2	4	0.41	0.65	0.49	4	2.72	10.11	6.15	2	1
BBC_E41	2016	0.2	3	0.51	0.57	0.54	4	1.95	4.65	3.19	4	0
BBC_E41	2017	0.2	3	0.44	0.69	0.59	3	4.13	8.63	5.75	2	0
BBC_E41	2018	0.2	4	0.37	0.69	0.50	4	2.03	5.02	3.19	4	0
BBC_E41	2019	0.2	4	0.37	0.83	0.50	4	2.80	5.64	4.03	3	0
BBC_E56	2015	0.2	4	0.46	0.72	0.61	4	2.35	23.14	9.61	2	1
BBC_E56	2016	0.2	4	0.50	0.74	0.62	4	3.13	7.66	5.14	2	0
BBC_E56	2017	0.2	3	0.51	0.82	0.65	3	3.32	9.16	6.03	1	0
BBC_E56	2018	0.2	3	0.48	0.73	0.57	4	3.27	8.08	4.96	3	0
BBC_E56	2019	0.2	3	0.50	0.89	0.71	4	7.78	12.03	9.34	0	1
BBC_E69	2015	0.2	4	0.66	0.87	0.76	4	5.23	15.45	8.56	0	1
BBC_E69	2015	2.6	4	0.54	0.68	0.60	4	4.32	10.95	7.47	1	1
BBC_E69	2016	0.2	4	0.72	0.84	0.77	4	2.89	7.42	5.55	2	0
BBC_E69	2016	2.1	4	0.68	0.96	0.83	4	2.48	6.72	4.33	3	0
BBC_E69	2017	0.2	3	0.63	0.89	0.75	3	4.91	12.74	7.53	2	1
BBC_E69	2017	1.5	3	0.59	0.76	0.68	3	4.17	11.68	6.74	2	1
BBC_E69	2018	0.2	4	0.56	0.76	0.64	4	4.25	9.83	6.88	1	0
BBC_E69	2018	2.1	4	0.56	0.73	0.63	4	3.62	8.78	6.43	1	0
BBC_E69	2019	0.2	3	0.55	1.25	0.81	4	7.38	26.78	14.74	0	3
BBC_N1	2015	0.2	4	0.77	1.99	1.18	4	10.36	61.44	35.05	0	4
BBC_N1	2016	0.2	3	0.79	0.99	0.89	4	3.92	5.01	4.44	4	0
BBC_N1	2017	0.2	3	0.66	1.38	1.08	3	9.22	26.68	15.86	0	2
BBC_N1	2018	0.2	4	0.67	1.13	0.85	4	3.29	15.58	7.16	2	1
BBC_N1	2019	0.2	1	0.69	0.69	0.69	2	2.29	15.56	8.93	1	1
BBC_N2	2015	0.2	4	0.67	0.94	0.81	4	6.27	32.16	16.35	0	2
BBC_N2	2016	0.2	4	0.73	0.97	0.84	4	3.37	6.21	4.73	2	0
BBC_N2	2017	0.2	3	0.82	1.18	1.02	3	6.30	10.97	8.65	0	1
BBC_N2	2018	0.2	3	0.60	0.95	0.72	4	3.57	14.76	7.99	1	1
BBC_N2	2019	0.2	2	0.57	0.75	0.66	2	7.38	26.41	16.90	0	1
BBC_N3	2015	0.2	4	0.68	1.03	0.82	4	5.70	26.95	14.00	0	2
BBC_N3	2016	0.2	4	0.63	0.90	0.76	4	2.62	4.58	3.39	4	0
BBC_N3	2017	0.2	3	0.71	0.90	0.81	3	6.17	11.81	8.12	0	1
BBC_N3	2018	0.2	4	0.65	0.81	0.71	4	3.17	10.62	7.19	1	1
BBC_N3	2019	0.2	3	0.59	1.33	0.87	3	2.87	6.29	4.42	2	0
BBC_N4	2015	0.2	4	0.62	0.86	0.74	4	6.32	26.12	14.74	0	3
BBC_N4	2016	0.2	4	0.65	0.82	0.75	4	3.53	6.72	4.83	3	0
BBC_N4	2017	0.2	3	0.74	1.02	0.90	3	5.37	12.65	8.06	0	1
BBC_N4	2018	0.2	3	0.58	1.09	0.81	4	4.17	13.49	7.83	1	1
BBC_N4	2019	0.2	3	0.63	1.39	0.89	4	0.96	21.70	11.94	1	3

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_103E	06/16/15	09/23/15	14	0.7	1.7	1.1
BBC_103E	05/31/16	09/17/16	13	0.9	1.8	1.4
BBC_103E	05/31/17	09/20/17	17	0.7	1.7	1.2
BBC_103E	05/29/18	09/19/18	19	1.1	1.4	1.2
BBC_103E	05/30/19	09/14/19	20	0.4	1.5	0.8
BBC_104E	07/01/15	09/23/15	8	0.7	1.1	0.9
BBC_104E	05/31/16	09/13/16	6	0.8	1.0	0.9
BBC_104E	05/31/17	09/20/17	10	0.5	1.2	0.9
BBC_104E	05/31/18	09/19/18	6	0.4	1.2	0.7
BBC_104E	06/20/19	09/23/19	8	0.5	1.0	0.8
BBC_106E	06/10/15	10/09/15	7	0.3	1.0	0.7
BBC_106E	06/07/16	09/16/16	3	0.8	1.1	0.9
BBC_106E	06/06/17	08/25/17	7	0.5	1.1	0.8
BBC_106E	06/12/18	09/18/18	5	0.7	1.1	0.8
BBC_106E	06/04/19	08/28/19	10	0.6	1.0	0.9
BBC_E30	07/13/15	08/25/15	4	1.8	2.8	2.3
BBC_E30	07/05/16	08/15/16	4	1.5	3.0	2.2
BBC_E30	07/06/17	08/17/17	3	1.6	1.6	1.6
BBC_E30	07/10/18	08/21/18	4	1.6	1.8	1.7
BBC_E30	07/11/19	08/15/19	4	0.9	3.4	2.0
BBC_E33	07/13/15	08/25/15	4	1.4	2.2	1.7
BBC_E33	07/05/16	08/15/16	4	1.7	2.2	1.9
BBC_E33	07/06/17	08/17/17	3	1.4	1.5	1.5
BBC_E33	07/10/18	08/21/18	4	1.0	1.6	1.4
BBC_E33	07/11/19	08/15/19	4	0.8	1.4	1.2
BBC_E41	08/25/15	08/25/15	1	1.5	1.5	1.5
BBC_E41	07/05/16	08/15/16	3	1.4	2.0	1.7
BBC_E41	07/06/17	08/17/17	3	1.5	1.9	1.7
BBC_E41	07/10/18	08/21/18	4	1.4	1.7	1.6
BBC_E41	07/11/19	08/15/19	4	0.8	1.9	1.5
BBC_E56	07/13/15	08/25/15	4	1.3	1.8	1.5
BBC_E56	07/05/16	08/15/16	4	1.0	1.4	1.3
BBC_E56	08/17/17	08/17/17	1	0.8	0.8	0.8
BBC_E56	07/10/18	08/21/18	4	1.1	1.9	1.5
BBC_E56	07/11/19	08/15/19	4	0.8	1.7	1.1
BBC_E69	07/13/15	08/25/15	4	1.0	1.4	1.3
BBC_E69	07/05/16	08/15/16	4	1.2	1.9	1.5
BBC_E69	07/06/17	08/17/17	3	1.1	1.3	1.2
BBC_E69	07/10/18	08/21/18	4	1.0	1.3	1.2
BBC_E69	07/11/19	08/15/19	4	0.5	1.4	0.9
BBC_N1	07/13/15	08/25/15	3	0.5	0.7	0.6
BBC_N1	07/06/17	07/06/17	1	0.5	0.5	0.5
BBC_N1	07/24/18	08/21/18	3	0.6	0.7	0.7
BBC_N1	07/11/19	08/15/19	2	0.5	0.8	0.7

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_N2	07/27/15	08/25/15	3	0.7	1.0	0.8
BBC_N2	07/06/17	08/17/17	2	1.0	1.3	1.2
BBC_N2	08/07/18	08/21/18	2	0.8	0.8	0.8
BBC_N2	08/15/19	08/15/19	1	0.5	0.5	0.5
BBC_N3	07/24/18	07/24/18	1	0.8	0.8	0.8
BBC_N3	07/25/19	08/15/19	2	0.4	0.7	0.6
BBC_N4	07/13/15	08/25/15	3	0.7	1.3	1.0
BBC_N4	07/05/16	08/01/16	3	1.0	1.4	1.2
BBC_N4	08/03/17	08/17/17	2	0.9	1.5	1.2
BBC_N4	07/10/18	08/21/18	4	0.9	1.3	1.1
BBC_N4	07/11/19	08/15/19	4	0.5	1.2	0.8

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_106E	06/16/15	12/09/15	0.2	7	0.018	0.130	0.053
BBC_106E	01/06/16	09/26/16	0.1	8	0.004	0.068	0.024
BBC_106E	03/08/17	09/19/17	0.2	5	0.010	0.043	0.028
BBC_E30	07/13/15	08/25/15	0.2	4	0.016	0.041	0.026
BBC_E30	07/05/16	08/15/16	0.2	4	0.011	0.024	0.017
BBC_E30	07/06/17	08/17/17	0.2	3	0.005	0.008	0.007
BBC_E30	07/10/18	08/21/18	0.2	4	0.005	0.021	0.013
BBC_E30	07/11/19	08/15/19	0.2	4	0.007	0.022	0.014
BBC_E33	07/13/15	08/25/15	0.2	4	0.023	0.054	0.034
BBC_E33	07/05/16	08/15/16	0.2	4	0.010	0.023	0.015
BBC_E33	07/06/17	08/17/17	0.2	3	0.006	0.016	0.011
BBC_E33	07/10/18	08/21/18	0.2	4	0.004	0.029	0.014
BBC_E33	07/11/19	08/15/19	0.2	4	0.004	0.047	0.025
BBC_E41	07/13/15	08/25/15	0.2	4	0.012	0.030	0.018
BBC_E41	07/05/16	08/15/16	0.2	3	0.008	0.014	0.011
BBC_E41	07/06/17	08/17/17	0.2	3	0.006	0.009	0.008
BBC_E41	07/10/18	08/21/18	0.2	4	0.005	0.010	0.007
BBC_E41	07/11/19	08/15/19	0.2	4	0.012	0.041	0.024
BBC_E56	07/13/15	08/25/15	0.2	4	0.009	0.045	0.030
BBC_E56	07/05/16	08/15/16	0.2	4	0.006	0.056	0.022
BBC_E56	07/06/17	08/17/17	0.2	3	0.006	0.022	0.012
BBC_E56	07/10/18	08/21/18	0.2	4	0.004	0.028	0.014
BBC_E56	07/11/19	08/15/19	0.2	4	0.004	0.042	0.016
BBC_E69	07/13/15	08/25/15	0.2	4	0.058	0.117	0.080
BBC_E69	07/13/15	08/25/15	2.6	4	0.062	0.108	0.077
BBC_E69	07/05/16	08/15/16	0.2	4	0.027	0.093	0.061
BBC_E69	07/05/16	08/15/16	2.1	4	0.067	0.238	0.122

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_E69	07/06/17	08/17/17	0.2	3	0.014	0.071	0.038
BBC_E69	07/06/17	08/17/17	1.5	3	0.017	0.070	0.037
BBC_E69	07/10/18	08/21/18	0.2	4	0.022	0.040	0.032
BBC_E69	07/10/18	08/21/18	2.1	4	0.024	0.036	0.032
BBC_E69	07/11/19	08/15/19	0.2	4	0.004	0.059	0.033
BBC_N1	07/13/15	08/25/15	0.2	4	0.025	0.047	0.037
BBC_N1	07/05/16	08/15/16	0.2	4	0.010	0.042	0.019
BBC_N1	07/06/17	08/17/17	0.2	3	0.005	0.024	0.012
BBC_N1	07/10/18	08/21/18	0.2	4	0.005	0.008	0.007
BBC_N1	07/11/19	08/15/19	0.2	2	0.004	0.004	0.004
BBC_N2	07/13/15	08/25/15	0.2	4	0.012	0.049	0.036
BBC_N2	07/05/16	08/15/16	0.2	4	0.011	0.042	0.025
BBC_N2	07/06/17	08/17/17	0.2	3	0.009	0.034	0.019
BBC_N2	07/10/18	08/21/18	0.2	4	0.004	0.009	0.007
BBC_N2	07/11/19	08/15/19	0.2	2	0.004	0.007	0.005
BBC_N3	07/13/15	08/25/15	0.2	4	0.016	0.058	0.034
BBC_N3	07/05/16	08/15/16	0.2	4	0.011	0.061	0.036
BBC_N3	07/06/17	08/17/17	0.2	3	0.009	0.034	0.018
BBC_N3	07/10/18	08/21/18	0.2	4	0.006	0.056	0.023
BBC_N3	07/11/19	08/15/19	0.2	3	0.004	0.073	0.032
BBC_N4	07/13/15	08/25/15	0.2	4	0.025	0.064	0.049
BBC_N4	07/05/16	08/15/16	0.2	4	0.029	0.139	0.069
BBC_N4	07/06/17	08/17/17	0.2	3	0.011	0.166	0.077
BBC_N4	07/10/18	08/21/18	0.2	4	0.004	0.028	0.015
BBC_N4	07/11/19	08/15/19	0.2	4	0.004	0.072	0.025

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this East Branch Westport River AU (MA95-41); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
East Branch Westport River (MA95-41): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 2.552 sq mi (96%). The sum of the approved, conditionally approved, and restricted shellfish growing areas represents 2.235 sq mi (84%). The prohibited shellfish growing area represents 0.317 sq mi (12%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of prohibited and approved, conditionally approved, and/or restricted. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as Not Supporting.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB3.1	Westport Harbor Mooring Area	Conditionally Approved	0.00072	0.0%
BB3.13	Boat Ramp	Prohibited	0.00084	0.0%
BB3.37	Main Road	Conditionally Approved	0.00191	0.1%
BB3.40	West of Route 88 Bridge	Approved	0.03352	1.3%
BB4.0	Horseneck Channel & The Let	Approved	0.16694	6.3%
BB4.1	Boiling Brook	Prohibited	0.00378	0.1%
BB4.11	Cadman Cove Brook	Prohibited	0.00152	0.1%
BB4.15	Lakes Island	Conditionally Approved	0.29038	10.9%
BB4.2	Northern End of the River	Prohibited	0.30797	11.6%
BB4.25	Wings Brook	Prohibited	0.00053	0.0%
BB4.27	Julius Way Mooring Area	Conditionally Approved	0.00851	0.3%
BB4.5	Pierce Brook	Prohibited	0.00111	0.0%
BB4.6	Lees Brook	Prohibited	0.00128	0.0%
BB4.7	Lower River	Conditionally Approved	0.83240	31.4%
BB4.8	Middle River	Conditionally Approved	0.62396	23.5%
BB4.9	Cadman Neck	Conditionally Approved	0.27664	10.4%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this East Branch Westport River AU (MA95-41) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
<p>Prior to 2011, bacteria data were collected by MassDEP staff (with assistance from the Westport River Association) for the purposes of bacteria source tracking (BST) in this East Branch Westport River AU (MA95-41). Samples were collected at 18 sites, with <i>Enterococcus</i> concentrations ranging from 10 to 563MPN and the highest concentration documented in a cove receiving discharge from a small pond (locally known as Allen Pond). Expanding on this work, additional BST samples were collected in 2011 to 2013, from a series of unnamed tributaries discharging to a targeted reach of the AU (i.e., the stretch between Old County Road and Hix bridge). <i>Enterococcus</i> concentrations in Everett Cove were found to range from 63 to 148MPN and a maximum of 359MPN was documented in an unnamed cove further downstream. Small salt marsh drainage ditches were noted to be bacteria contributors, in particular one such ditch a short distance downstream of County Rd documented a maximum of 809MPN. The highest concentrations in the watershed were documented in an unnamed tributary at Pine Hill Rd (upstream of Allen Pond) (maximum of 1,986MPN). No correctable sources were found.</p> <p>Too limited bacteria data are available to evaluate the Primary Contact Recreational Use for this East Branch Westport River AU (MA95-41) so it will continue to be assessed as Not Supporting with the Fecal Coliform impairment being carried forward. An Alert is being identified due to the elevated <i>Enterococcus</i> concentrations documented in two coves along the AU (Everett Cove and one unnamed) by the MassDEP BST staff.</p>	

Bacteria Data

MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019 (MassDEP Undated2)

Summary
Prior to 2011, BST work was conducted (with assistance from the Westport River Association) at 18 sites on the East Branch Westport River AU (MA95-41), with Enterococcus concentrations ranging 10 to 563MPN and the highest concentration noted in a cove receiving discharge from a small pond (locally known as Allen Pond). Expanding on this work, additional BST samples were collected in 2011 to 2013, from a series of unnamed tributaries discharging to a targeted reach of the AU (i.e., the stretch between Old County Road and Hix bridge). Enterococcus concentrations in Everett Cove were found to range 63 to 148MPN and a max of 359MPN was noted in an unnamed cove further downstream. Small salt marsh drainage ditches were noted to be bacteria contributors, in particular one such ditch a short distance downstream of County Rd noted a max of 809MPN. Samples taken on an unnamed tributary at Pine Hill Rd (upstream of Allen Pond) indicated the highest concentrations found in the watershed, with a max of 1,986MPN. No correctable sources were found in the watershed.

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
East Branch Westport River (MA95-41): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 2.552 sq mi (96%). The approved shellfish growing area represents 0.2005 sq mi (8%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>Prior to 2011, bacteria data were collected by MassDEP staff (with assistance from the Westport River Association) for the purposes of bacteria source tracking (BST) in this East Branch Westport River AU (MA95-41). Samples were collected at 18 sites, with Enterococcus concentrations ranging from 10 to 563MPN and the highest concentration documented in a cove receiving discharge from a small pond (locally known as Allen Pond). Expanding on this work, additional BST samples were collected in 2011 to 2013, from a series of unnamed tributaries discharging to a targeted reach of the AU (i.e., the stretch between Old County Road and Hix bridge). Enterococcus concentrations in Everett Cove were found to range from 63 to 148MPN and a maximum of 359MPN was documented in an unnamed cove further downstream. Small salt marsh drainage ditches were noted to be bacteria contributors, in particular one such ditch a short distance downstream of County Rd documented a maximum of 809MPN. The highest concentrations in the watershed were documented in an unnamed tributary at Pine Hill Rd (upstream of Allen Pond) (maximum of 1,986MPN). No correctable sources were found.</p> <p>Too limited bacteria data are available to evaluate the Secondary Contact Recreational Use for this East Branch Westport River AU (MA95-41) so it will continue to be assessed as Not Supporting with the Fecal Coliform impairment being carried forward.</p>	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
East Branch Westport River (MA95-41): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 2.552 sq mi (96%). The approved shellfish growing area represents 0.2005 sq mi (8%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

East Head Pond (MA95177)

Location:	Carver/Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	92 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Recommendations

2022 Recommendations
ALU: Conduct an aquatic macrophyte survey in East Head Pond (MA95177) when flowering heads are present to determine if any non-native species of <i>Myriophyllum</i> are infesting the pond.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
As was previously reported, MassDEP staff noted the presence of <i>Myriophyllum</i> sp. in East Head Pond (MA95177) during a July 1995 synoptic survey. Too limited data are available to assess the Aquatic Life Use for East Head Pond (MA95177) so it is Not Assessed. The prior Alert for the presence of <i>Myriophyllum</i> sp. (potentially a non-native species) is being carried forward with a recommendation to conduct an aquatic macrophyte survey.	

Biological Monitoring Information

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995)

Summary Statement	Assessment Recommendation
As was previously reported, MassDEP staff noted the presence of <i>Myriophyllum</i> sp. in East Head Pond during a July 1995 synoptic survey. An aquatic macrophyte survey should be conducted to determine whether any of the non-native species of <i>Myriophyllum</i> are present in the pond and the prior Alert should be retained.	Conduct an aquatic macrophyte survey in East Head Pond when flowering heads are present to determine if any non-native species of <i>Myriophyllum</i> are infesting the pond.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
Although fish toxics sampling was done in East Head Pond in 1989, no site-specific fish consumption advisory was issued by DPH. The Fish Consumption Use for East Head Pond (MA95177) is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for East Head Pond (MA95177) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for East Head Pond (MA95177) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for East Head Pond (MA95177) so it is Not Assessed.	

East River (MA95-95)

Location:	From Main Avenue, Wareham to Onset Bay, including Broad Cove, Wareham.
AU Type:	ESTUARY
AU Size:	0.12 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	5	Estuarine Bioassessments		Added
--	5	Fecal Coliform		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary <p>The MassDEP Eelgrass Mapping Project documented a ~98% loss of eelgrass bed habitat in the East River between 1995 and 2017; the last time any eelgrass beds were documented in the upper section of the AU was during the 2006-2007 surveys. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at two locations in the East River, Wareham (MA95-95) in the summers of 2015-2019 as follows: on the west side of the AU at the downstream edge of an area locally known as Broad-Muddy Cove at the Main Ave bridge (BBC_BD1) and close to the seaward end off a dock just upstream of the Onset Ave bridge (BBC_ER1). Monitoring was conducted in the surface waters at both locations, as well as deeper in the water column (at average depths ranging from 1.0 to 1.8m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 25.5°C (n=276). The minimum dissolved oxygen (DO) was 5.0mg/L (n=276); <6.0mg/L 22 times (~8% of the measurements overall). Total nitrogen sampling (n=28, maximum 0.59mg/L) during ebb tides in July and August documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.3-0.39mg/L, with the higher concentrations more commonly documented at Broad-Muddy Cove (BBC_BD1). The maximum Chlorophyll <i>a</i> concentration was 9.34µg/L (n=38); >5µg/L 15 times. Secchi disk depths ranged from 1.0 to 2.3m (n=74). Ammonia-nitrogen concentrations were low (0.004 to 0.02mg/L, n=38), though TUs could not be calculated (lack of quality assured pH and salinity data). Despite the generally good water quality conditions documented in the East River by BBC, the Aquatic Life Use for East River (MA95-95) is assessed as Not Supporting based on the decrease in eelgrass bed habitat documented by the MassDEP mapping project between 1995 and 2017. An impairment for Estuarine Bioassessments is being added.</p>	

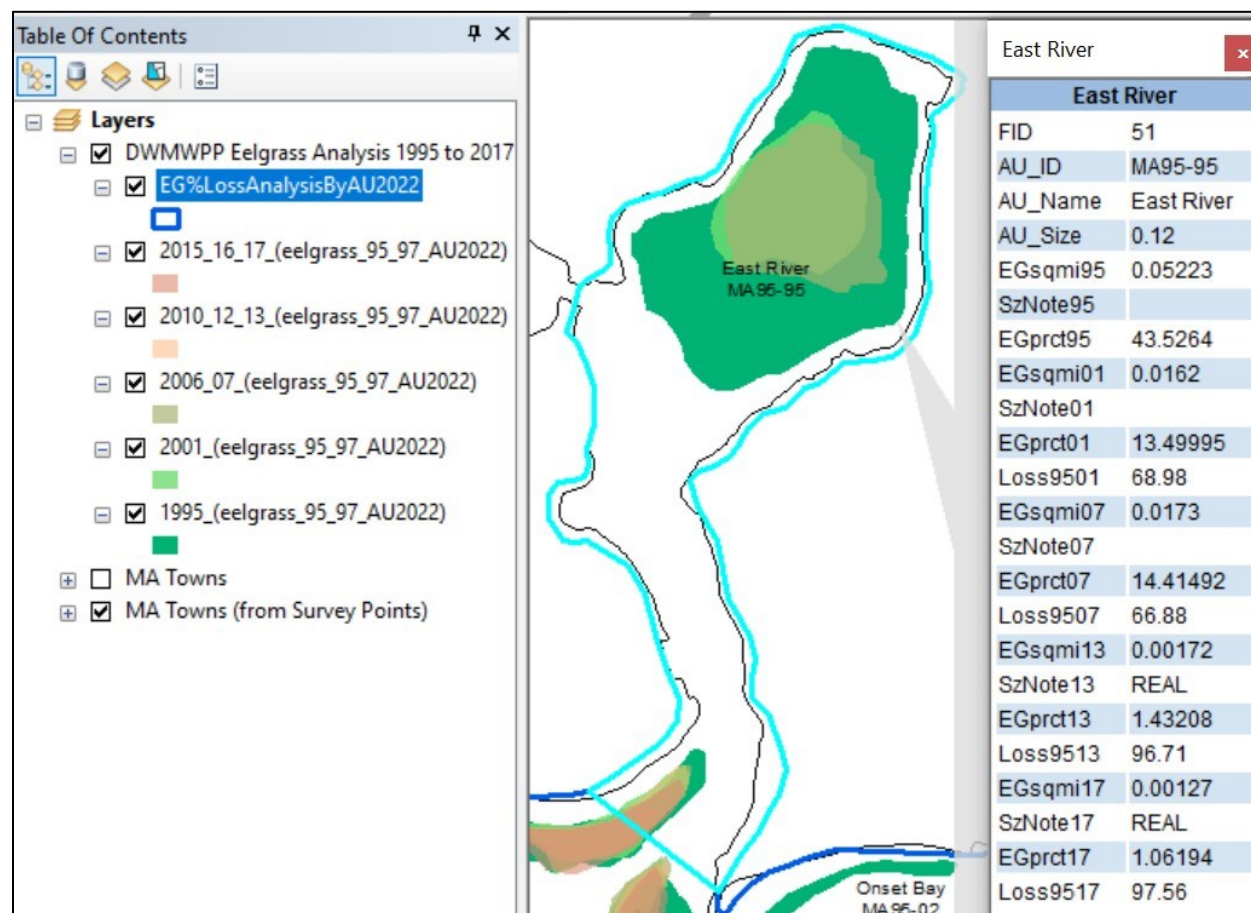
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_BD1	Buzzards Bay Coalition	Water Quality	Onset Bay	Broad-Muddy Cove, Wareham	41.747914	-70.65591
BBC_ER1	Buzzards Bay Coalition	Water Quality	Onset Bay	Onset Bay East River, Wareham	41.742743	-70.6539

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for East River MA95-95 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~98% loss of eelgrass bed habitat in the East River between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_BD1	09/15/15	09/15/15	0.2	1	6.5	6.5	0	0	0
BBC_BD1	09/15/15	09/15/15	1.3	1	6.4	6.4	0	0	0
BBC_BD1	06/01/16	09/17/16	0.2	13	5.5	6.6	8	0	0
BBC_BD1	06/01/16	09/21/16	1.2	15	5.0	6.4	13	0	0
BBC_BD1	05/31/17	09/01/17	0.2	9	6.0	7.1	0	0	0
BBC_BD1	05/31/17	09/13/17	1.3	11	6.0	6.8	0	0	0
BBC_BD1	07/09/18	09/19/18	0.2	6	6.0	6.8	0	0	0
BBC_BD1	06/17/18	09/19/18	1.0	9	5.5	6.6	22	0	0
BBC_BD1	06/15/19	09/14/19	0.2	6	7.0	8.2	0	0	0
BBC_BD1	06/15/19	09/22/19	1.0	13	6.0	7.6	0	0	0
BBC_ER1	06/04/15	09/24/15	0.2	20	5.0	6.8	10	0	0
BBC_ER1	06/04/15	09/24/15	1.7	20	5.5	7.0	10	0	0
BBC_ER1	06/07/16	09/20/16	0.2	20	5.5	6.7	5	0	0
BBC_ER1	06/07/16	09/20/16	1.7	20	5.0	6.8	10	0	0
BBC_ER1	06/12/17	09/21/17	0.2	20	6.0	6.5	0	0	0
BBC_ER1	06/12/17	09/21/17	1.8	20	6.0	6.6	0	0	0
BBC_ER1	06/16/18	09/19/18	0.2	19	5.5	6.3	26	0	0
BBC_ER1	06/16/18	09/19/18	1.8	19	5.5	6.4	16	0	0
BBC_ER1	06/12/19	09/24/19	0.2	17	5.5	6.7	12	0	0
BBC_ER1	06/12/19	09/24/19	1.7	17	6.0	6.8	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_BD1	07/13/15	09/15/15	0.2	5	5	23.0	21.3	0
BBC_BD1	09/15/15	09/15/15	1.3	1	1	19.3	19.3	0
BBC_BD1	06/01/16	09/17/16	0.2	17	16	25.5	21.8	0
BBC_BD1	06/01/16	09/21/16	1.3	14	12	24.0	20.7	0
BBC_BD1	05/31/17	09/01/17	0.2	13	12	24.5	21.3	0
BBC_BD1	05/31/17	09/13/17	1.3	11	10	23.0	20.0	0
BBC_BD1	07/09/18	09/19/18	0.2	9	8	24.9	22.5	0
BBC_BD1	06/17/18	09/19/18	1.0	9	8	23.5	20.9	0
BBC_BD1	06/15/19	09/14/19	0.2	9	9	24.2	21.2	0
BBC_BD1	06/15/19	09/22/19	1.0	13	12	24.8	21.6	0
BBC_ER1	06/04/15	09/24/15	0.2	24	23	23.0	20.1	0
BBC_ER1	06/04/15	09/24/15	1.6	20	19	23.5	19.6	0
BBC_ER1	06/07/16	09/20/16	0.2	24	22	25.0	20.9	0
BBC_ER1	06/07/16	09/20/16	1.7	20	18	24.0	20.4	0
BBC_ER1	06/12/17	09/21/17	0.2	24	22	24.2	20.4	0
BBC_ER1	06/12/17	09/21/17	1.8	19	17	22.8	19.9	0
BBC_ER1	06/16/18	09/19/18	0.2	19	17	25.1	21.9	0
BBC_ER1	06/16/18	09/19/18	1.8	16	14	24.6	21.3	0
BBC_ER1	06/12/19	09/24/19	0.2	20	17	25.0	21.9	0
BBC_ER1	06/12/19	09/24/19	1.7	17	14	24.5	21.4	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_BD1	2015	0.2	3	0.27	0.41	0.32	4	3.83	9.33	7.18	1	0
BBC_BD1	2016	0.2	4	0.32	0.43	0.37	4	3.72	4.95	4.18	4	0
BBC_BD1	2017	0.2	2	0.33	0.59	0.46	4	3.86	6.04	5.24	1	0
BBC_BD1	2018	0.2	3	0.34	0.41	0.38	4	4.25	9.34	6.34	2	0
BBC_BD1	2019	0.2	2	0.35	0.47	0.41	3	3.93	7.30	5.35	2	0
BBC_ER1	2015	0.2	4	0.26	0.36	0.30	4	3.54	8.84	7.02	1	0
BBC_ER1	2016	0.2	4	0.27	0.36	0.32	4	2.92	4.94	3.78	4	0
BBC_ER1	2017	0.2	1	0.30	0.30	0.30	4	3.30	5.39	4.43	3	0
BBC_ER1	2018	0.2	3	0.34	0.43	0.39	4	3.23	5.64	4.34	3	0
BBC_ER1	2019	0.2	2	0.41	0.42	0.41	3	2.63	5.27	4.10	2	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_BD1	07/27/15	07/27/15	1	1.6	1.6	1.6
BBC_BD1	06/01/16	09/07/16	6	1.3	1.8	1.5
BBC_BD1	06/21/17	08/16/17	4	1.7	1.9	1.8
BBC_BD1	07/09/18	08/07/18	3	1.4	1.7	1.5
BBC_BD1	06/27/19	09/14/19	3	1.6	1.9	1.7
BBC_ER1	06/30/15	09/14/15	10	1.0	2.3	1.8
BBC_ER1	06/16/16	08/31/16	12	1.5	2.1	1.9
BBC_ER1	06/22/17	09/21/17	15	1.6	2.2	1.9
BBC_ER1	06/22/18	09/19/18	13	1.7	2.2	2.0
BBC_ER1	07/02/19	09/16/19	7	1.5	2.2	2.0

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_BD1	07/13/15	08/25/15	0.2	4	0.009	0.012	0.010
BBC_BD1	07/05/16	08/15/16	0.2	4	0.006	0.013	0.009
BBC_BD1	07/06/17	08/16/17	0.2	4	0.004	0.008	0.006
BBC_BD1	07/10/18	08/21/18	0.2	4	0.004	0.006	0.005
BBC_BD1	07/11/19	08/08/19	0.2	3	0.005	0.017	0.010
BBC_ER1	07/13/15	08/25/15	0.2	4	0.007	0.020	0.013
BBC_ER1	07/05/16	08/15/16	0.2	4	0.009	0.014	0.012

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_ER1	07/06/17	08/16/17	0.2	4	0.004	0.015	0.007
BBC_ER1	07/10/18	08/21/18	0.2	4	0.004	0.013	0.008
BBC_ER1	07/11/19	08/08/19	0.2	3	0.004	0.011	0.007

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in East River (MA95-95); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
East River (MA95-95): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1092 sq mi (88%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications, a fecal coliform impairment is being added.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB40.3	Town Pier Mooring Area	Conditionally Approved	0.01241	10.1%
BB40.4	Onset Ave Bridge	Prohibited	0.00092	0.7%
BB42.2	East River/Broad Cove	Conditionally Approved	0.09491	76.9%
BB42.3	Muddy Cove	Conditionally Approved	0.00087	0.7%
BB42.4	East River Boat Ramp	Prohibited	0.00007	0.1%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for East River (MA95-95) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There are three beaches in East River, Wareham (MA95-95); the names and ID codes for the beaches named from up to downstream are as follows: Riverside (ID 3183), East Boulevard (ID 3190), and Onset (ID 3184). The beaches were either rarely or never posted with advisories for swimming between 2014 and 2019. The Primary Contact Recreational Use for East River (MA95-95) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the Riverside, East Boulevard, or Onset beaches between 2014 and 2019.	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
3183	Riverside Avenue/Wareham	41.74803	-70.65580	41.75058	-70.65250	3%	0%	0%	0%	0%	0%	0
3184	Onset/Wareham	41.73845	-70.66390	41.74233	-70.65410	2%	0%	0%	0%	0%	0%	0
3190	East Boulevard/Wareham	41.74513	-70.65650	41.74417	-70.65510	3%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
East River (MA95-95): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1092 sq mi (88%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There are three beaches in East River, Wareham (MA95-95); the names and ID codes for the beaches named from up to downstream are as follows: Riverside (ID 3183), East Boulevard (ID 3190), and Onset (ID 3184). The beaches were either rarely or never posted with advisories for swimming between 2014 and 2019. The Secondary Contact Recreational Use for East River (MA95-95) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the Riverside, East Boulevard, or Onset beaches between 2014 and 2019.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
East River (MA95-95): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1092 sq mi (88%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Eel Pond (MA95-48)

Location:	Salt water pond that discharges to the Back River, Bourne.
AU Type:	ESTUARY
AU Size:	0.03 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			

Recommendations

2022 Recommendations
ALU: Conduct total nitrogen sampling (at least three times per season at mid-ebb tide) as well as primary producer biological screening and DO measurements, in addition to benthic macroinvertebrate sampling at the six MEP locations sampled in Fall 2003, to better evaluate the nature and extent of possible nutrient enrichment impairments for this Eel Pond AU (MA95-48).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at four locations in Eel Pond, Bourne (MA95-48) in the summers of 2015-2019 as follows; from shore at the south end (BBC_EP1), in the middle of the pond towards the south end (BBC_EP1A), from shore on the west side (BBC_EP2), and in the middle towards the north end (limited sampling in 2015)(BBC_EP2A). Monitoring was conducted most frequently in surface waters at all locations, and less often at average depths ranging from 0.3-0.5m and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 28.0°C (n=167). The minimum dissolved oxygen (DO) was 3.5mg/L (n=148); <6.0mg/L ~49% of the measurements overall and <5.0mg/L ~21% of the measurements overall. Total nitrogen sampling (n=20, maximum measurement 0.74mg/L) during ebb tides in July and August documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.35-0.6mg/L, just once >0.5mg/L. The maximum chlorophyll *a* was 53.08µg/L (n=36); >5µg/L 31 times and >10µg/L 13 times (most often at BBC_EP2). Secchi disk depths at BBC_EP1A ranged from 0.7-1.9m (n=6). Ammonia-nitrogen concentrations ranged from 0.004 to 0.03mg/L (n=36), though TUs could not be calculated (lack of quality assured pH and salinity data). It is being noted here that these conditions were similar to those documented during MEP studies conducted 2002-2004 and that benthic macroinvertebrate sampling data (Fall 2003) were indicative of a generally healthy infaunal community for the Eel Pond habitat (generally good number of species and individuals, mollusks and crustaceans accounted for 34% of the species and deeper burrowing forms were observed) (Howes, Kelley, et al. 2006).

The Aquatic Life Use of Eel Pond (MA95-48) will continue to be assessed as Fully Supporting based on the generally good water quality conditions (consistent with those of a relatively deep drowned kettle pond with a narrow tidal channel connection to lower Back River) as documented by the BBC staff/volunteers in 2015-2019. An Alert is being identified due to some evidence of nutrient enrichment documented by the BBC between 2015-2019 (i.e., elevated chlorophyll *a* and intermittently elevated total nitrogen). Recommendations will be made for additional monitoring including benthic sampling to better evaluate the nature of any possible impairments. It is noted, however, that this AU does have a TMDL for Total Nitrogen (with a secondary target of 0.45mg/L for this waterbody) as part of the Phinneys Harbor Embayment System Total Maximum Daily Loads for Total Nitrogen report CN#247.0.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_EP1	Buzzards Bay Coalition	Water Quality	Eel Pond, Bourne	Eel Pond, Bourne, Bourne	41.72285	-70.608434
BBC_EP1A	Buzzards Bay Coalition	Water Quality	Eel Pond, Bourne	Eel Pond, Bourne, Bourne	41.724678	-70.609326
BBC_EP2	Buzzards Bay Coalition	Water Quality	Eel Pond, Bourne	Eel Pond, Bourne, Bourne	41.725442	-70.610754
BBC_EP2A	Buzzards Bay Coalition	Water Quality	Eel Pond, Bourne	Eel Pond, Bourne, Bourne	41.726479	-70.609989

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_EP1	06/10/15	09/23/15	0.2	19	4.5	6.7	16	5	0
BBC_EP1	07/20/16	08/20/16	0.2	2	4.0	4.3	100	100	0
BBC_EP1	05/31/16	09/24/16	0.3	19	3.5	6.2	53	11	5
BBC_EP1	06/17/17	09/21/17	0.2	12	4.5	5.5	75	25	0
BBC_EP1	06/06/17	08/07/17	0.3	9	4.0	5.6	33	33	0
BBC_EP1	05/30/18	09/19/18	0.2	20	4.0	5.5	55	25	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_EP1	09/11/18	09/11/18	0.5	1	5.0	5.0	100	0	0
BBC_EP2	06/10/15	08/20/15	0.2	8	4.1	5.4	63	38	0
BBC_EP2	07/22/17	09/19/17	0.2	11	4.0	5.0	91	36	0
BBC_EP2	08/02/17	08/08/17	0.3	2	4.5	6.0	50	50	0
BBC_EP2	05/30/18	09/04/18	0.2	19	3.5	5.9	42	26	5
BBC_EP2	05/30/19	09/13/19	0.2	20	4.5	6.2	45	10	0
BBC_EP2	08/22/19	08/22/19	0.4	1	6.0	6.0	0	0	0
BBC_EP2A	06/25/15	06/25/15	0.2	1	11.0	11.0	0	0	0
BBC_EP2A	06/05/15	07/01/15	0.4	4	8.5	9.9	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_EP1	06/10/15	09/23/15	0.2	19	17	25.0	22.5	0
BBC_EP1	07/20/16	08/20/16	0.2	2	2	22.0	22.0	0
BBC_EP1	05/31/16	09/24/16	0.3	19	16	22.5	20.5	0
BBC_EP1	06/17/17	09/21/17	0.2	12	10	23.3	20.8	0
BBC_EP1	06/06/17	08/07/17	0.3	9	9	25.2	20.9	0
BBC_EP1	05/30/18	09/19/18	0.2	20	18	28.0	22.5	0
BBC_EP1	09/11/18	09/11/18	0.5	1	1	20.0	20.0	0
BBC_EP1	07/11/19	08/15/19	0.2	4	4	26.0	24.5	0
BBC_EP1A	07/13/15	08/25/15	0.2	4	4	24.0	21.9	0
BBC_EP1A	07/05/16	08/15/16	0.2	3	3	27.0	24.5	0
BBC_EP1A	07/06/17	08/17/17	0.2	4	4	26.0	24.2	0
BBC_EP1A	07/10/18	08/07/18	0.2	3	3	28.0	26.2	0
BBC_EP2	06/10/15	08/25/15	0.2	12	12	26.0	23.6	0
BBC_EP2	07/05/16	08/15/16	0.2	3	3	28.0	24.8	0
BBC_EP2	07/06/17	09/19/17	0.2	15	13	26.0	22.7	0
BBC_EP2	08/02/17	08/08/17	0.3	2	2	23.5	22.7	0
BBC_EP2	05/30/18	08/27/18	0.2	18	17	27.8	22.6	0
BBC_EP2	05/30/19	09/13/19	0.2	24	23	26.6	22.1	0
BBC_EP2	08/22/19	08/22/19	0.4	1	1	24.5	24.5	0
BBC_EP2A	05/29/15	06/25/15	0.2	2	1	20.0	20.0	0
BBC_EP2A	06/05/15	07/01/15	0.3	4	4	20.0	18.3	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_EP1	2019	0.2	4	0.34	0.74	0.47	4	5.27	6.33	5.66	0	0
BBC_EP1A	2015	0.2	3	0.29	0.43	0.35	4	3.31	7.45	5.94	1	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_EP1A	2016	0.2	--	--	--	--	3	6.54	10.96	8.07	0	1
BBC_EP1A	2017	0.2	1	0.39	0.39	0.39	4	1.79	53.08	17.03	2	2
BBC_EP1A	2018	0.2	1	0.36	0.36	0.36	3	3.10	7.25	4.79	2	0
BBC_EP2	2015	0.2	3	0.35	0.56	0.46	4	7.74	12.28	9.46	0	1
BBC_EP2	2016	0.2	1	0.69	0.69	0.69	3	8.31	13.43	11.06	0	2
BBC_EP2	2017	0.2	1	0.50	0.50	0.50	4	8.89	18.45	11.96	0	2
BBC_EP2	2018	0.2	3	0.57	0.64	0.60	3	11.58	13.22	12.29	0	3
BBC_EP2	2019	0.2	3	0.35	0.51	0.46	4	5.36	16.44	10.10	0	2

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_EP1A	07/13/15	08/25/15	3	1.2	1.9	1.6
BBC_EP1A	07/20/17	08/03/17	2	1.0	1.5	1.3
BBC_EP1A	07/24/18	07/24/18	1	0.7	0.7	0.7

Toxics and other pollutants (metals, ammonia, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_EP1	07/11/19	08/15/19	0.2	4	0.009	0.034	0.019
BBC_EP1A	07/13/15	08/25/15	0.2	4	0.006	0.014	0.011
BBC_EP1A	07/05/16	08/15/16	0.2	3	0.004	0.007	0.005
BBC_EP1A	07/06/17	08/17/17	0.2	4	0.004	0.008	0.005
BBC_EP1A	07/10/18	08/07/18	0.2	3	0.004	0.006	0.005
BBC_EP2	07/13/15	08/25/15	0.2	4	0.009	0.018	0.013
BBC_EP2	07/05/16	08/15/16	0.2	3	0.005	0.012	0.008
BBC_EP2	07/06/17	08/17/17	0.2	4	0.004	0.008	0.006
BBC_EP2	07/10/18	08/07/18	0.2	3	0.004	0.009	0.007
BBC_EP2	07/11/19	08/15/19	0.2	4	0.004	0.012	0.006

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Eel Pond (MA95-48); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Eel Pond (MA95-48): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0267 sq mi (84%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB47.2	Back River and Eel Pond	Conditionally Approved	0.02673	83.5%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Eel Pond (MA95-48) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Eel Pond (MA95-48) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Eel Pond (MA95-48): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0267 sq mi (84%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Eel Pond (MA95-48) so it is Not Assessed.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Eel Pond (MA95-48): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0267 sq mi (84%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Eel Pond (MA95-61)

Location:	Coastal pond at the head of Mattapoisett Harbor, Mattapoisett.
AU Type:	ESTUARY
AU Size:	0.04 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Dissolved Oxygen		Added
5	5	Fecal Coliform	36172	Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)	X					

Recommendations

2022 Recommendations
ALU: Collect additional total nitrogen and chlorophyll <i>a</i> sampling on ebb tides in Eel Pond (MA95-61) to confirm continued nutrient enrichment conditions.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring in the surface waters of Eel Pond, Mattapoissett (MA95-61) at two locations; one in the main basin at Godspeed Island Rd Bridge (BBC_EL1) and one slightly outside the AU to the south, within what now appears to be a channel that connects the pond to Mattapoissett Harbor (BBC_EL2). Monitoring was conducted in the surface waters, as well as at depths ranging 0.4-0.6m and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature in the main basin at BBC_EL1 was 29.0°C, twice measured >29.4 at BBC_EL2 (n=247 overall). The dissolved oxygen (DO) concentrations were often low throughout the water column at both locations (n=236, minimum 2mg/L), frequently measuring <6.0mg/L (72% of all measurements), with severe excursions (i.e., <5.0mg/L) also occurring frequently (51% of all measurements). Nutrient sampling efforts (ebb tides in May-September) documented seasonal average total nitrogen concentrations at the two sites (n=25, maximum 1.24mg/L) for sites/year with n>2 samples between 0.40-0.58mg/L, >0.5mg/L 3/6 times at both locations in 2017 and at just BBC_EL1 in 2018. Chlorophyll *a* concentrations were higher in the main basin (BBC_EL1) where the maximum was 20.5µg/L (n=19) on 15 occasions >5µg/L and exceeded the 10µg/L threshold at least once a year (three times in 2015) than at the channel location (BBC_EL2) (maximum 10.9µg/L (n=19), eight times >5µg/L and exceeded the 10µg/L threshold just once). Secchi disk depth at BBC_EL1 (n=7), were indicative of consistently low transparency (range 0.5-0.7m). Ammonia-nitrogen concentrations ranged from 0.004 to 0.05mg/L (n=39), but TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for this Eel Pond AU (MA95-61) will continue to be assessed as Not Supporting based on the water quality data collected by the BBC staff/volunteers in 2015-2019, which were indicative of enriched conditions. The impairment for Nutrient/Enrichment Biological Indicators is being carried forward and a new impairment is being added for Dissolved Oxygen.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_EL1	Buzzards Bay Coalition	Water Quality	Eel Pond, Mattapoissett	Eel Pond, Mattapoissett, Mattapoissett	41.657605	-70.819502
BBC_EL2	Buzzards Bay Coalition	Water Quality	Eel Pond, Mattapoissett	Eel Pond, Mattapoissett, Mattapoissett	41.655337	-70.821956

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_EL1	05/29/15	09/19/15	0.2	14	2.0	4.9	79	64	14
BBC_EL1	05/29/15	09/23/15	0.5	14	2.0	4.2	86	71	50
BBC_EL1	05/31/16	09/16/16	0.2	21	2.0	4.4	81	62	33
BBC_EL1	05/31/16	09/24/16	0.5	17	2.0	4.3	94	65	24
BBC_EL1	06/13/17	09/16/17	0.2	18	2.0	4.2	94	61	22
BBC_EL1	06/13/17	09/16/17	0.5	17	2.0	4.0	94	65	35
BBC_EL1	05/30/18	09/20/18	0.2	17	2.0	4.5	76	53	41
BBC_EL1	05/30/18	09/20/18	0.4	18	2.0	4.3	83	56	39
BBC_EL1	08/08/19	08/15/19	0.2	3	4.6	5.8	67	33	0
BBC_EL1	05/30/19	09/23/19	0.5	19	2.5	5.1	58	37	11
BBC_EL2	06/05/15	09/01/15	0.2	7	2.1	5.6	57	29	14
BBC_EL2	06/05/15	09/01/15	0.6	14	2.0	5.9	36	21	7
BBC_EL2	06/07/16	07/17/16	0.2	5	4.0	5.2	60	60	0
BBC_EL2	06/17/16	06/17/16	0.4	1	6.1	6.1	0	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_EL2	06/12/17	09/11/17	0.2	7	3.6	5.4	57	29	14
BBC_EL2	06/27/17	09/06/17	0.6	2	3.5	5.1	50	50	50
BBC_EL2	07/14/18	07/14/18	0.1	1	7.0	7.0	0	0	0
BBC_EL2	05/31/18	09/19/18	0.4	20	2.0	4.2	90	65	45
BBC_EL2	06/14/19	08/15/19	0.2	2	7.0	7.4	0	0	0
BBC_EL2	05/30/19	09/23/19	0.5	19	3.5	6.2	26	16	5

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_EL1	05/29/15	09/19/15	0.2	18	16	26.5	22.2	0
BBC_EL1	05/29/15	09/23/15	0.5	14	12	25.4	22.5	0
BBC_EL1	05/31/16	09/16/16	0.2	26	24	29.0	23.4	0
BBC_EL1	05/31/16	09/24/16	0.5	18	15	26.0	22.7	0
BBC_EL1	06/13/17	09/16/17	0.2	21	20	25.5	21.7	0
BBC_EL1	06/13/17	09/16/17	0.4	17	16	24.3	21.3	0
BBC_EL1	05/30/18	09/20/18	0.2	21	18	26.0	22.0	0
BBC_EL1	05/30/18	09/20/18	0.4	18	15	27.0	21.7	0
BBC_EL1	07/11/19	08/15/19	0.2	5	5	25.3	23.2	0
BBC_EL1	05/30/19	09/23/19	0.5	19	16	25.0	21.5	0
BBC_EL2	06/05/15	09/01/15	0.2	11	11	26.5	22.9	0
BBC_EL2	06/05/15	09/01/15	0.6	14	14	25.1	21.6	0
BBC_EL2	06/07/16	08/15/16	0.2	9	9	29.5	25.0	1
BBC_EL2	06/17/16	06/17/16	0.4	1	1	20.8	20.8	0
BBC_EL2	06/12/17	09/11/17	0.2	10	10	26.0	21.7	0
BBC_EL2	06/27/17	09/06/17	0.6	2	2	20.9	20.8	0
BBC_EL2	07/10/18	08/21/18	0.1	5	5	27.0	23.8	0
BBC_EL2	05/31/18	09/19/18	0.4	20	18	22.0	19.6	0
BBC_EL2	06/14/19	08/15/19	0.2	4	4	29.9	23.5	1
BBC_EL2	05/30/19	09/23/19	0.5	19	16	25.0	20.9	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_EL1	2015	0.2	3	0.33	0.63	0.44	4	7.13	13.05	10.44	0	3
BBC_EL1	2016	0.2	1	0.64	0.64	0.64	4	4.42	20.50	10.91	1	2
BBC_EL1	2017	0.2	4	0.46	0.70	0.58	4	3.16	14.66	7.71	1	1
BBC_EL1	2018	0.2	3	0.49	0.57	0.54	3	7.41	15.65	10.56	0	1
BBC_EL1	2019	0.2	2	0.59	1.24	0.91	4	2.62	12.51	6.83	2	1

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_EL2	2015	0.2	4	0.32	0.58	0.46	4	4.79	8.01	6.65	1	0
BBC_EL2	2016	0.2	1	0.46	0.46	0.46	4	3.86	10.90	6.15	2	1
BBC_EL2	2017	0.2	3	0.45	0.62	0.53	4	4.41	8.76	5.73	2	0
BBC_EL2	2018	0.2	3	0.36	0.44	0.40	4	3.25	4.75	4.06	4	0
BBC_EL2	2019	0.2	1	0.76	0.76	0.76	3	3.89	7.94	5.39	2	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_EL1	05/31/16	07/16/16	4	0.5	0.6	0.5
BBC_EL1	06/17/17	06/17/17	1	0.7	0.7	0.7
BBC_EL1	06/26/19	08/08/19	2	0.6	0.7	0.6

Toxics and other pollutants (metals, ammonia, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_EL1	07/13/15	08/25/15	0.2	4	0.008	0.050	0.020
BBC_EL1	07/05/16	08/15/16	0.2	4	0.004	0.008	0.006
BBC_EL1	07/06/17	08/17/17	0.2	4	0.008	0.015	0.011
BBC_EL1	07/10/18	08/21/18	0.2	4	0.004	0.010	0.006
BBC_EL1	07/11/19	08/15/19	0.2	4	0.004	0.043	0.017
BBC_EL2	07/13/15	08/25/15	0.2	4	0.011	0.030	0.019
BBC_EL2	07/05/16	08/15/16	0.2	4	0.004	0.012	0.007
BBC_EL2	07/06/17	08/17/17	0.2	4	0.004	0.022	0.012
BBC_EL2	07/10/18	08/21/18	0.2	4	0.004	0.012	0.007
BBC_EL2	07/11/19	08/15/19	0.2	3	0.004	0.049	0.020

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Eel Pond (MA95-61); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

Eel Pond (MA95-61): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0293 sq mi (73%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0293 sq mi (73%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB25.11	Town Docks	Prohibited	0.00000	0.0%
BB25.2	Mattapoissett Inner Harbor	Conditionally Approved	0.00000	0.0%
BB27.0	Eel Pond	Prohibited	0.02925	72.6%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Eel Pond AU (MA95-61) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for this Eel Pond AI (MA95-61) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Eel Pond (MA95-61): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0293 sq mi (73%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for this Eel Pond AU (MA95-61) so it is Not Assessed.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Eel Pond (MA95-61): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0293 sq mi (73%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Ezekiel Pond (MA95051)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	36 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	5	Mercury in Fish Tissue		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Mercury in Fish Tissue	Atmospheric Deposition (N)		X			

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aquatic Life Use for Ezekiel Pond (MA95051) so it is Not Assessed.	

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP biologists conducted fish toxics sampling at Ezekiel Pond in Plymouth in May 2018 as part of the probabilistic lake surveys (MAP2). Because of elevated mercury measured in chain pickerel and largemouth bass fillets, MassDPH issued the following fish consumption advisory:</p> <ul style="list-style-type: none"> <i>"Children younger than 12 years of age, pregnant women, women of childbearing age who may become pregnant, and nursing mothers should not eat any of the affected fish species (chain pickerel, largemouth bass) from this water body."</i> <i>"The general public should limit consumption of affected fish species (chain pickerel, largemouth bass) to two meals per month."</i> <p>Since there is a site-specific DPH advisory for elevated mercury in fish tissue, the Fish Consumption Use for Ezekiel Pond (MA95051) is assessed as Not Supporting. An impairment for Mercury in Fish Tissue is being added. The likely source, although not confirmed, is Atmospheric Deposition.</p>	

MassDEP fish toxics sampling information (2018-2020) and MassDPH Fish Consumption Advisory information (2019-2021) (MassDPH 2021, MassDEP 2018, MassDEP Undated11)

MassDEP biologists conducted fish toxics sampling at Ezekiel Pond in Plymouth in May 2018 as part of the probabilistic lake surveys (MAP2). Because of elevated mercury measured in chain pickerel and largemouth bass fillets, MassDPH issued the following fish consumption advisories:

- *"Children younger than 12 years of age, pregnant women, women of childbearing age who may become pregnant, and nursing mothers should not eat any of the affected fish species (chain pickerel, largemouth bass) from this water body."*
- *"The general public should limit consumption of affected fish species (chain pickerel, largemouth bass) to two meals per month."*

Since there is a site specific DPH advisory for elevated mercury in fish tissue, the Fish Consumption Use for Ezekiel Pond (MA95051) is assessed as Not Supporting. The likely source, although not confirmed, is atmospheric deposition.

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Ezekiel Pond (MA95051) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for Ezekiel Pond (MA95051) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Ezekiel Pond (MA95051) so it is Not Assessed.	

Fawn Pond (MA95053)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	44 ACRES
Classification/Qualifier:	B

No usable data were available for Fawn Pond (MA95053) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Fearing Pond (MA95054)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	23 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	2	None		Unchanged

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aquatic Life Use for Fearing Pond (MA95054) so it is Not Assessed.	

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Fearing Pond (MA95054); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Fearing Pond (MA95054) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There is one beach in Fearing Pond, Plymouth (MA95054) known as Fearing Pond (DCR) (ID 4632). This beach was either rarely or never posted with advisories for swimming between 2014 and 2019. The Primary Contact Recreational Use for Fearing Pond (MA95054) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the Fearing Pond (DCR) beach between 2014 and 2019.	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
4632	Fearing Pond (DCR)/Plymouth	41.82857	-70.66530	41.82950	-70.66350	0%	1%	0%	1%	0%	0%	0

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There is one beach in Fearing Pond, Plymouth (MA95054) known as Fearing Pond (DCR) (ID 4632). This beach was either rarely or never posted with advisories for swimming between 2014 and 2019.</p> <p>The Secondary Contact Recreational Use for Fearing Pond (MA95054) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the Fearing Pond (DCR) beach between 2014 and 2019.</p>	

Federal Pond (MA95055)

Location:	Carver/Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	122 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added
4c	4c	(Non-Native Aquatic Plants*)		Unchanged
4c	4c	(Swollen Bladderwort*)		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fanwort*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X		X	X	X
(Non-Native Aquatic Plants*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
(Swollen Bladderwort*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>As was previously reported, MassDEP staff identified infestations of the non-native aquatic macrophytes, fanwort (<i>Cabomba caroliniana</i>) and variable milfoil (<i>Myriophyllum heterophyllum</i>), in Federal Pond during a July 1995 synoptic survey. Additionally, MassDCR's database of non-native species observations includes a record of MassDFG Natural Heritage staff identifying swollen bladderwort (<i>Utricularia inflata</i>) in the pond.</p> <p>The Aquatic Life Use for Federal Pond (MA95055) will continue to be assessed as Not Supporting. The Non-Native Aquatic Plants impairment (for <i>Myriophyllum heterophyllum</i>) is being carried forward and new impairments for the non-native aquatic macrophyte species Fanwort and Swollen Bladderwort are being added.</p>	

Biological Monitoring Information

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995, MassDCR 2008)

Summary Statement

As was previously reported, MassDEP staff identified infestations of the non-native aquatic macrophytes, fanwort (*Cabomba caroliniana*) and variable milfoil (*Myriophyllum heterophyllum*), in Federal Pond during a July 1995 synoptic survey. Additionally, MassDCR's database of non-native species observations includes a record of MassDFG Natural Heritage staff identifying swollen bladderwort (*Utricularia inflata*) in the pond.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Federal Pond (MA95055); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
As was previously reported, MassDEP staff described the surface water of Federal Pond as very densely covered with the non-native aquatic macrophyte fanwort (<i>Cabomba caroliniana</i>) during a July 1995 synoptic survey (MassDEP 2003). The Aesthetic Use for Federal Pond (MA95055) will continue to be assessed as Not Supporting because of the very dense infestation of the non-native aquatic macrophyte fanwort (<i>C. caroliniana</i>). The generic Non-Native Aquatic Plants impairment for this use is being clarified to Fanwort.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
As was previously reported, MassDEP staff described the surface water of Federal Pond as very densely covered with the non-native aquatic macrophyte fanwort (<i>Cabomba caroliniana</i>) during a July 1995 synoptic survey (MassDEP 2003). The Primary Contact Recreational Use for Federal Pond (MA95055) will continue to be assessed as Not Supporting because of the very dense infestation of the non-native aquatic macrophyte fanwort (<i>C. caroliniana</i>). The generic Non-Native Aquatic Plants impairment for this use is being clarified to Fanwort.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
As was previously reported, MassDEP staff described the surface water of Federal Pond as very densely covered with the non-native aquatic macrophyte fanwort (<i>Cabomba caroliniana</i>) during a July 1995 synoptic survey (MassDEP 2003). The Secondary Contact Recreational Use for Federal Pond (MA95055) will continue to be assessed as Not Supporting because of the very dense infestation of the non-native aquatic macrophyte fanwort (<i>C. caroliniana</i>). The generic Non-Native Aquatic Plants impairment for this use is being clarified to Fanwort.	

Fiddlers Cove (MA95-79)

Location:	cove south off Megansett Harbor, Falmouth.
AU Type:	ESTUARY
AU Size:	0.01 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Dissolved Oxygen	R1_MA_2018_02	Changed
5	5	Estuarine Bioassessments	R1_MA_2018_02	Changed
5	5	Fecal Coliform		Unchanged
5	5	Nitrogen, Total	R1_MA_2018_02	Changed
5	5	Nutrient/Eutrophication Biological Indicators	R1_MA_2018_02	Changed

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Golf Courses (Y)	X					
Dissolved Oxygen	Impervious Surface/Parking Lot Runoff (Y)	X					
Dissolved Oxygen	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Dissolved Oxygen	Residential Districts (Y)	X					
Estuarine Bioassessments	Golf Courses (Y)	X					
Estuarine Bioassessments	Impervious Surface/Parking Lot Runoff (Y)	X					
Estuarine Bioassessments	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Estuarine Bioassessments	Residential Districts (Y)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Golf Courses (Y)	X					
Nitrogen, Total	Impervious Surface/Parking Lot Runoff (Y)	X					
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nitrogen, Total	Residential Districts (Y)	X					
Nutrient/Eutrophication Biological Indicators	Golf Courses (Y)	X					
Nutrient/Eutrophication Biological Indicators	Impervious Surface/Parking Lot Runoff (Y)	X					
Nutrient/Eutrophication Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nutrient/Eutrophication Biological Indicators	Residential Districts (Y)	X					

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Dissolved Oxygen	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Fiddlers Cove and Rands Harbor Embayment Systems for Nitrogen (Total) (Report CN 394.1, approved 2018-02-13, ATTAINS Action ID: R1_MA_2018_02)
Nitrogen, Total	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Fiddlers Cove and Rands Harbor Embayment Systems for Nitrogen (Total) (Report CN 394.1, approved 2018-02-13, ATTAINS Action ID: R1_MA_2018_02)
Nutrient/Eutrophication Biological Indicators	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Fiddlers Cove and Rands Harbor Embayment Systems for Nitrogen (Total) (Report CN 394.1, approved 2018-02-13, ATTAINS Action ID: R1_MA_2018_02)
Estuarine Bioassessments	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Fiddlers Cove and Rands Harbor Embayment Systems for Nitrogen (Total) (Report CN 394.1, approved 2018-02-13, ATTAINS Action ID: R1_MA_2018_02)

Recommendations

2022 Recommendations
AES: Conduct monitoring in Fiddlers Cove (MA95-79) to better evaluate aesthetics quality conditions making specific notes on odors, deposits, growths, and turbidity.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in Fiddlers Cove, Falmouth (MA95-79) in the summers 2015 to 2019 as follows: at the inside end of the cove (BBC_FC3), from a dock halfway down/out of the cove (BBC_FC1X), and from a dock near the mouth of the cove (BBC_FC1N). Monitoring was conducted in the surface waters at all locations as well as deeper in the water column at BBC_FC1X (at average depths ranging from 2.1 to 2.4m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 26.5°C (n=181). The minimum dissolved oxygen (DO) was 4.0mg/L (n=189): <6.0mg/L 46 times (~24% of the measurements overall) and <5.0mg/L eight times (~4% of the measurements overall). Total nitrogen sampling (n=30, maximum 3.05mg/L) during ebb tides in July and August documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.33-0.87mg/L (three of eight seasonal average calculations were >0.5mg/L at the most upstream site (BBC_FC3)). The maximum Chlorophyll <i>a</i> was 197.37µg/L (n=32); >5µg/L 16 times and >10µg/L four times (13%). Secchi disk depths throughout the AU ranged from 1.2 to 2.9m (n=103). Ammonia-nitrogen concentrations were low (range 0.004 to 0.081mg/L, n=32), but TUs could not be calculated (lack of quality assured pH and salinity data).</p> <p>The Aquatic Life Use for Fiddlers Cove (MA95-79) will continue to be assessed as Not Supporting based on the data collected by BBC staff/volunteers in the summers of 2015 through 2019. The Dissolved Oxygen, Estuarine Bioassessments, Total Nitrogen, and Nutrient Eutrophication Biological Indicators impairments are all being carried forward.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_FC1N	Buzzards Bay Coalition	Water Quality	Fiddlers Cove	Fiddlers Cove, Falmouth	41.647978	-70.636003
BBC_FC1X	Buzzards Bay Coalition	Water Quality	Fiddlers Cove	Fiddlers Cove, Falmouth	41.645791	-70.636772
BBC_FC3	Buzzards Bay Coalition	Water Quality	Fiddlers Cove	Fiddlers Cove, Falmouth	41.644052	-70.635648

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_FC1N	07/05/16	08/15/16	0.2	3	5.8	6.3	33	0	0
BBC_FC1N	07/06/17	08/17/17	0.2	4	4.6	6.5	50	25	0
BBC_FC1N	07/10/18	08/21/18	0.2	3	6.6	6.7	0	0	0
BBC_FC1N	07/11/19	08/15/19	0.2	4	5.8	6.7	25	0	0
BBC_FC1X	05/28/15	09/23/15	0.2	22	4.5	6.9	9	5	0
BBC_FC1X	05/28/15	09/23/15	2.4	22	4.0	7.2	5	5	0
BBC_FC1X	06/01/16	08/21/16	0.2	13	5.0	6.0	23	0	0
BBC_FC1X	06/01/16	08/21/16	2.1	14	6.0	6.8	0	0	0
BBC_FC1X	07/26/17	09/06/17	0.2	7	4.8	5.8	71	14	0
BBC_FC1X	07/26/17	09/06/17	2.3	7	4.7	5.7	43	14	0
BBC_FC1X	05/30/18	09/19/18	0.2	20	5.0	6.2	50	0	0
BBC_FC1X	05/30/18	09/15/18	2.2	19	5.0	6.4	21	0	0
BBC_FC1X	05/30/19	09/23/19	0.2	20	5.0	6.5	15	0	0
BBC_FC1X	05/30/19	09/23/19	2.3	20	5.5	6.4	25	0	0
BBC_FC3	08/15/16	08/15/16	0.2	1	4.7	4.7	100	100	0
BBC_FC3	07/06/17	08/17/17	0.2	3	4.6	5.8	67	33	0
BBC_FC3	07/10/18	08/21/18	0.2	3	6.3	7.1	0	0	0
BBC_FC3	07/11/19	08/15/19	0.2	4	4.8	6.0	50	25	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_FC1N	07/13/15	08/10/15	0.2	3	3	26.0	24.3	0
BBC_FC1N	07/05/16	08/15/16	0.2	4	4	26.5	25.4	0
BBC_FC1N	07/06/17	08/17/17	0.2	4	4	24.7	23.7	0
BBC_FC1N	07/10/18	08/21/18	0.2	4	4	26.3	24.0	0
BBC_FC1N	07/11/19	08/15/19	0.2	4	4	24.3	24.0	0
BBC_FC1X	05/28/15	09/23/15	0.2	22	19	25.0	21.6	0
BBC_FC1X	05/28/15	09/23/15	2.4	22	19	26.5	22.3	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_FC1X	06/01/16	08/21/16	0.2	13	13	26.0	20.7	0
BBC_FC1X	06/01/16	08/21/16	2.1	14	14	26.0	21.4	0
BBC_FC1X	07/26/17	09/06/17	0.2	7	7	23.6	21.6	0
BBC_FC1X	07/26/17	09/06/17	2.3	7	7	23.6	22.3	0
BBC_FC1X	05/30/18	09/19/18	0.2	20	18	25.8	21.9	0
BBC_FC1X	05/30/18	09/19/18	2.2	20	18	26.3	22.5	0
BBC_FC1X	05/30/19	09/23/19	0.2	20	17	25.5	21.2	0
BBC_FC1X	05/30/19	09/23/19	2.3	20	17	26.4	21.8	0
BBC_FC3	08/01/16	08/15/16	0.2	2	2	26.0	25.4	0
BBC_FC3	07/06/17	08/17/17	0.2	3	3	24.6	23.4	0
BBC_FC3	07/10/18	08/21/18	0.2	4	4	26.3	24.0	0
BBC_FC3	07/11/19	08/15/19	0.2	4	4	24.4	23.5	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_FC1N	2015	0.2	3	0.26	0.41	0.33	3	2.21	7.04	4.59	2	0
BBC_FC1N	2016	0.2	4	0.37	0.44	0.40	4	3.47	5.48	4.09	3	0
BBC_FC1N	2017	0.2	4	0.34	0.56	0.43	4	1.91	9.34	4.34	3	0
BBC_FC1N	2018	0.2	4	0.28	0.46	0.37	4	3.53	5.07	4.33	3	0
BBC_FC1N	2019	0.2	4	0.25	0.55	0.39	4	3.44	11.79	6.47	1	1
BBC_FC3	2016	0.2	2	0.53	3.05	1.79	2	2.53	197.37	99.95	1	1
BBC_FC3	2017	0.2	3	0.48	0.57	0.53	3	2.50	8.33	5.47	1	0
BBC_FC3	2018	0.2	3	0.54	1.48	0.87	4	3.18	85.70	25.41	2	1
BBC_FC3	2019	0.2	3	0.43	1.02	0.69	4	6.20	22.29	11.13	0	1

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_FC1N	07/13/15	08/10/15	3	2.2	2.4	2.3
BBC_FC1N	07/05/16	08/15/16	4	1.9	2.4	2.2
BBC_FC1N	07/06/17	08/03/17	3	1.5	2.5	2.1
BBC_FC1N	07/10/18	08/21/18	4	2.3	2.8	2.6
BBC_FC1N	07/11/19	08/15/19	4	1.6	2.5	2.1
BBC_FC1X	05/28/15	09/14/15	19	1.8	2.7	2.2
BBC_FC1X	06/01/16	08/21/16	13	1.4	2.9	2.1
BBC_FC1X	07/26/17	09/06/17	6	1.8	2.3	2.0
BBC_FC1X	05/30/18	09/19/18	17	1.8	2.4	2.0

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_FC1X	05/30/19	09/23/19	20	1.6	2.8	2.0
BBC_FC3	08/15/16	08/15/16	1	2.0	2.0	2.0
BBC_FC3	07/06/17	07/20/17	2	1.2	2.1	1.7
BBC_FC3	07/10/18	08/07/18	3	1.8	1.9	1.9
BBC_FC3	07/11/19	08/15/19	4	1.6	2.2	1.9

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_FC1N	07/13/15	08/10/15	0.2	3	0.014	0.081	0.049
BBC_FC1N	07/05/16	08/15/16	0.2	4	0.015	0.022	0.019
BBC_FC1N	07/06/17	08/17/17	0.2	4	0.006	0.039	0.020
BBC_FC1N	07/10/18	08/21/18	0.2	4	0.005	0.022	0.012
BBC_FC1N	07/11/19	08/15/19	0.2	4	0.004	0.012	0.009
BBC_FC3	08/01/16	08/15/16	0.2	2	0.018	0.039	0.028
BBC_FC3	07/06/17	08/17/17	0.2	3	0.010	0.040	0.025
BBC_FC3	07/10/18	08/21/18	0.2	4	0.004	0.037	0.020
BBC_FC3	07/11/19	08/15/19	0.2	4	0.004	0.022	0.010

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Fiddlers Cove (MA95-79); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Fiddlers Cove (MA95-79): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0119 sq mi (82%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is <100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB50.1	Fiddlers Cove	Conditionally Approved	0.01189	82.1%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Fiddlers Cove (MA95-79) so it is Not Assessed. An Alert is being identified, however, due to intermittent observations of “very green or brown water or lots of particles”, noted in Fiddlers Cove by BBC staff/volunteers between 2015 and 2019.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Fiddlers Cove (MA95-79) so it is Not Assessed. An Alert is being identified, however, due to intermittent observations of “very green or brown water or lots of particles”, noted in Fiddlers Cove by BBC staff/volunteers between 2015 and 2019.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Fiddlers Cove (MA95-79): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0119 sq mi (82%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Fiddlers Cove (MA95-79) so it is Not Assessed. An Alert is being identified, however, due to intermittent observations of “very green or brown water or lots of particles”, noted in Fiddlers Cove by BBC staff/volunteers between 2015 and 2019.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Fiddlers Cove (MA95-79): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0119 sq mi (82%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Five Mile Pond (MA95056)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	22 ACRES
Classification/Qualifier:	B

No usable data were available for Five Mile Pond (MA95056) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Flax Pond (MA95-96087)

Location:	Bourne (formerly reported as 2010 segment: Flax Pond MA96087).
AU Type:	FRESHWATER LAKE
AU Size:	20 ACRES
Classification/Qualifier:	B

No usable data were available for Flax Pond (MA95-96087) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Fresh Meadow Pond (MA95174)

Location:	Carver/Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	59 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added
4c	4c	(Non-Native Aquatic Plants*)		Removed

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fanwort*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Non-Native Aquatic Plants	Clarification of listing cause	The generic Non-Native Aquatic Plants impairment code is being removed since the species-specific Fanwort impairment is being added.

Non-Native Aquatic Plants

The generic “Non-Native Aquatic Plants” impairment is being removed since the specific macrophyte Fanwort (*Cabomba caroliniana*) impairment is being added

Recommendations

2022 Recommendations
ALU: Conduct an aquatic macrophyte survey in Fresh Meadow Pond (MA95174) when flowering heads are present to confirm the presence of the non-native <i>Myriophyllum heterophyllum</i> in the pond (confirmation of any non-native species should be made by a qualified state agency/taxonomist).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	

As was previously reported, MassDEP staff conducting a July 1995 synoptic survey of Fresh Meadow Pond noted an infestation of the non-native aquatic macrophyte, fanwort (*Cabomba caroliniana*), as well as *Myriophyllum* sp. "(likely *heterophyllum*)."

The Aquatic Life Use for Fresh Meadow Pond will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment is being removed since the species-specific Fanwort impairment is being added. An Alert is being identified due to the possible presence of *M. heterophyllum* and a recommendation to conduct an aquatic macrophyte survey of the pond is being made.

Biological Monitoring Information

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995)

Summary Statement	Assessment Recommendation
As was previously reported, MassDEP staff conducting a July 1995 synoptic survey of Fresh Meadow Pond noted an infestation of the non-native aquatic macrophyte, fanwort (<i>Cabomba caroliniana</i>), as well as <i>Myriophyllum</i> sp. "(likely <i>heterophyllum</i>)."	Conduct an aquatic macrophyte survey in Fresh Meadow Pond when flowering heads are present to confirm the presence of the non-native <i>Myriophyllum heterophyllum</i> in the pond.
An aquatic macrophyte survey should be conducted to confirm the presence of variable milfoil (<i>Myriophyllum heterophyllum</i>) in the pond. In the interim, an Alert should be issued (it is unclear whether the prior Non-Native Aquatic Plants impairment was issued for just <i>Cabomba caroliniana</i> or for both <i>C. caroliniana</i> and <i>M. heterophyllum</i> but it is preferable that no impairment be made for the latter until there is confirmation of its presence).	

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Fresh Meadow Pond (MA95174); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Fresh Meadow Pond (MA95174) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for Fresh Meadow Pond (MA95174) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Fresh Meadow Pond (MA95174) so it is Not Assessed.	

Gallows Pond (MA95059)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	49 ACRES
Classification/Qualifier:	B

No usable data were available for Gallows Pond (MA95059) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Giles Creek (MA95-89)

Location:	From Demarest Lloyd Memorial State Park, Dartmouth to mouth at Slocums River, Dartmouth.
AU Type:	ESTUARY
AU Size:	0.06 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	3	None		Unchanged

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
No new/recent data are available to assess the Aquatic Life Use for Giles Creek (MA95-89) so it is Not Assessed. The Alert previously identified due to the presence of drift algae (Ulva) is being carried forward.	

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Giles Creek (MA95-89); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Insufficient Information	YES
2022 Use Attainment Summary	
Giles Creek (MA95-89): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0551 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0551 sq mi (91%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB8.0	Slocum's River	Prohibited	0.05507	90.9%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Giles Creek (MA95-89) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Giles Creek (MA95-89) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Giles Creek (MA95-89): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0551 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Giles Creek (MA95-89) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Giles Creek (MA95-89): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0551 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Glen Charlie Pond (MA95061)

Location:	Wareham.
AU Type:	FRESHWATER LAKE
AU Size:	157 ACRES
Classification/Qualifier:	B: WWF, HQW

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Recommendations

2022 Recommendations
ALU: Conduct an aquatic macrophyte survey of Glen Charlie Pond when flowering heads are present to determine if any non-native species of <i>Myriophyllum</i> or <i>Najas</i> are infesting the pond (confirmation of any non-native species should be made by a qualified state agency/taxonomist).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Insufficient Information	YES
2022 Use Attainment Summary	
<p>DMF biologists note two potential barriers providing adequate passage to diadromous fish into Glen Charlie Pond (MA95061), between the pond and the downstream Mill Pond AU (MA95105) (note: the small stretch of Agawam River immediately downstream of the pond upstream of Maple Park Road is not an AU). The targeted species in this area are river herring and American eel. The Glen Charlie Pond Dam (NATID# MA00028) (with existing Denil fishway), was given a passage score of "0", on a 0-10 scale (not an obstruction). DMF biologists noted that passage at the Denil fishway is adequate and the population score at this location was 5. The Maple Park Dam (NATID# MA02234) at Maple Park Main Road in Wareham, was given a passage score of "2" (minor obstruction) and the population score was 6. DMF biologists also noted that a barrier screen was installed at the fishway in 2002, but that installation of a hard structure diversion wall would be an improvement.</p> <p>As was previously reported, MassDEP staff noted the presence of <i>Myriophyllum</i> sp. (possibly heterophyllum) in Glen Charlie Pond during a July 1995 synoptic survey.</p> <p>Too limited data are available to assess the Aquatic Life Use for Glen Charlie Pond (MA95061), so it is assessed as having Insufficient Information. The prior Alert identified for the possible presence of <i>Myriophyllum</i> sp. is being carried forward and a recommendation is being made to conduct an aquatic macrophyte survey.</p>	

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary

DMF biologists note two potential barriers providing adequate passage at the downstream end of the Glen Charlie Pond AU for diadromous fish between the Pond and the Mill Pond AU (MA95105) a little way downstream (note: the stretch of Agawam River immediately downstream of the pond (i.e., upstream of Maple Park Road) is not a registered AU). The targeted species are river herring and American eel. The Glen Charlie Pond Dam (NATID# MA00028) (with existing Denil fishway), was given a passage score of "0", on a 0-10 scale (not an obstruction). DMF biologists noted that passage at the Denil fishway is adequate and the population score at this location was noted to be "5". The Maple Park Dam (NATID# MA02234) at Maple Park Main Road in Wareham, was given a passage score of "2" (minor obstruction) and the population score was noted to be "6" at this location. DMF biologists also noted that a barrier screen was installed at the fishway in 2002 and that installation of a hard structure diversion wall would be an improvement.

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995)

Summary Statement	Assessment Recommendation
As was previously reported, MassDEP staff noted the presence of <i>Myriophyllum</i> sp. (possibly heterophyllum) in Glen Charlie Pond during a July 1995 synoptic survey. An aquatic macrophyte survey should be conducted to determine whether any of the non-native species of <i>Myriophyllum</i> are present in the pond and the prior Alert should be retained.	Conduct an aquatic macrophyte survey of Glen Charlie Pond when flowering heads are present to determine if any non-native species of <i>Myriophyllum</i> or <i>Najas</i> are infesting the pond.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
Although fish toxics sampling was done in Glen Charlie Pond in 1995, no site-specific fish consumption advisory was issued by DPH. Since no site-specific advisory has been issued by MA DPH, the Fish Consumption Use for Glen Charlie Pond (MA95061) is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Glen Charlie Pond (MA95061) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for Glen Charlie Pond (MA95061) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Glen Charlie Pond (MA95061) so it is Not Assessed.	

Great Sippewisset Creek (MA95-23)

Location:	From the outlet of Beach Pond in Great Sippewisset Marsh, Falmouth to the mouth at Buzzards Bay, Falmouth (including Quahog Pond and the unnamed tributary from the outlet of Fresh Pond).
AU Type:	ESTUARY
AU Size:	0.03 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aquatic Life Use for Great Sippewisset Creek (MA95-23) so it is Not Assessed.	

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Great Sippewisset Creek (MA95-23); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

Great Sippewisset Creek (MA95-23): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0168 sq mi (51%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0168 sq mi (51%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB56.0	Great Sippewisset Marsh	Prohibited	0.01682	50.9%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Great Sippewisset Creek (MA95-23) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Great Sippewisset Creek (MA95-23) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Great Sippewisset Creek (MA95-23): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0168 sq mi (51%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Great Sippewisset Creek (MA95-23) so it is Not Assessed.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Great Sippewisset Creek (MA95-23): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0168 sq mi (51%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Halfway Pond (MA95178)

Location:	Plymouth (formerly reported as 1996 segment: Halfway Pond MA94057).
AU Type:	FRESHWATER LAKE
AU Size:	215 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Harmful Algal Blooms		Unchanged
5	5	Mercury in Fish Tissue		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Harmful Algal Blooms	Agriculture (N)			X	X	X
Harmful Algal Blooms	Source Unknown (N)			X	X	X
Mercury in Fish Tissue	Atmospheric Deposition (N)		X			

Recommendations

2022 Recommendations
ALU: Conduct an aquatic macrophyte survey of Halfway Pond (MA95178) when flowering heads are present to determine if any non-native species of <i>Myriophyllum</i> are infesting the pond (confirmation of any non-native species should be made by a qualified state agency/taxonomist).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
As was previously reported, MassDEP staff noted the presence of <i>Myriophyllum</i> sp. in Halfway Pond (MA95178) during a July 1995 synoptic survey. No recent data are available to assess the Aquatic Life Use for Halfway Pond (MA95178), so it is Not Assessed. The prior Alert for the presence of <i>Myriophyllum</i> sp. (possibly a non-native species) is being carried forward and a recommendation to conduct an aquatic macrophyte survey is being made.	

Biological Monitoring Information

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995)

Summary Statement	Assessment Recommendation
As was previously reported, MassDEP staff noted the presence of <i>Myriophyllum</i> sp. in Halfway Pond during a July 1995 synoptic survey. An aquatic macrophyte survey should be conducted to determine whether any of the non-native species of <i>Myriophyllum</i> are present in the pond and the prior Alert should be retained.	Conduct an aquatic macrophyte survey of Halfway Pond when flowering heads are present to determine if any non-native species of <i>Myriophyllum</i> are infesting the pond.

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP biologists conducted fish toxics sampling at Halfway Pond in Plymouth in May 2018 as part of the probabilistic lake surveys (MAP2). Because of elevated mercury measured in fish fillets, MassDPH issued the following fish consumption advisories:</p> <ul style="list-style-type: none"> "Children younger than 12 years of age, pregnant women, women of childbearing age who may become pregnant, and nursing mothers should not eat any fish from this water body." "The general public should limit consumption of all fish from this water body to two meals per month." <p>Since there is a site-specific DPH advisory for elevated mercury in fish tissue, the Fish Consumption Use for Halfway Pond (MA95178) is assessed as Not Supporting. A Mercury in Fish Tissue impairment is being added. The likely source, although not confirmed, is atmospheric deposition.</p>	

MassDEP fish toxics sampling information (2018-2020) and MassDPH Fish Consumption Advisory information (2019-2021) (MassDPH 2021, MassDEP 2018, MassDEP Undated11)

MassDEP biologists conducted fish toxics sampling at Halfway Pond in Plymouth in May 2018 as part of the probabilistic lake surveys (MAP2). Because of elevated mercury measured in fish fillets, MassDPH issued the following fish consumption advisories:

- "Children younger than 12 years of age, pregnant women, women of childbearing age who may become pregnant, and nursing mothers should not eat any fish from this water body."
- "The general public should limit consumption of all fish from this water body to two meals per month."

Since there is a site specific DPH advisory for elevated mercury in fish tissue, the Fish Consumption Use for Halfway Pond (MA95178) is assessed as Not Supporting. The likely source, although not confirmed, is atmospheric deposition.

Aesthetic

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>C-HAB postings for Halfway Pond (MA95178) were reported to MassDPH for 78 days in 2018 and 29 days in 2019. The Aesthetics Use for Halfway Pond (MA95178) will continue to be assessed as Not Supporting. The Harmful Algal Blooms impairment is being carried forward since blooms >20 days in duration were reported in two recent years.</p>	

Algal Bloom Information

Cyanobacteria Harmful Algal Bloom (C-HAB) Summary Statements for 2015-2019 MassDPH Data (Bailey, Logan April 15, 2021) (MassDEP Undated4)

C-HAB Summary Statement

C-HAB postings for Halfway Pond (MA95178) were reported to MassDPH for 78 days in 2018, and 29 days in 2019. Since blooms >20 days in duration were reported in two years, the Primary/Secondary Contact Recreational Uses and Aesthetics Use are assessed as Not Supporting.

Cyanobacteria Harmful Algal Bloom (C-HAB) Data (2015-2019) Provided by MassDPH (Bailey, Logan April 15, 2021)

Waterbody	Sample Analysis Used in Issuing Advisory	Bloom Days, 2015	Bloom Days, 2016	Bloom Days, 2017	Bloom Days, 2018	Bloom Days, 2019	# Years with >20 Days of Closure	>1 Posting Per Year
Halfway Pond	Not issued or confirmed by sampling				78	29	2	no

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
C-HAB postings for Halfway Pond (MA95178) were reported to MassDPH for 78 days in 2018 and 29 days in 2019. The Primary Contact Recreation Use for Halfway Pond (MA95178) will continue to be assessed as Not Supporting. The Harmful Algal Blooms impairment is being carried forward since blooms >20 days in duration were reported in two recent years.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
C-HAB postings for Halfway Pond (MA95178) were reported to MassDPH for 78 days in 2018 and 29 days in 2019. The Secondary Contact Recreation Use for Halfway Pond (MA95178) will continue to be assessed as Not Supporting. The Harmful Algal Blooms impairment is being carried forward since blooms >20 days in duration were reported in two recent years.	

Hammett Cove (MA95-56)

Location:	Borders Sippican Harbor (along a line from the southwestern most point of Little Neck to the end of the seawall on the opposite point), Marion.
AU Type:	ESTUARY
AU Size:	0.07 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Estuarine Bioassessments		Unchanged
5	5	Fecal Coliform	36172	Unchanged
5	5	Nitrogen, Total		Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Source Unknown (N)	X					
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)	X					

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an ~91% loss of eelgrass bed habitat in Hammett Cove between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in Hammett Cove, Marion (MA95-56) in the summers of 2015-2019, from inner to outer as follows: from shore in the inner eastern finger of the AU (BBC_HM1), from a dock in the inner western finger (BBC_HM0 only in 2016), and close to the outer edge of the AU (just north of gravel island) (BBC_HM3). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at BBC_HM1 and HM3 (average depth of 0.6-0.8m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 29°C (n=131); however, the minimum dissolved oxygen (DO) (the majority measured at BBC_HM1) was 2.0mg/L (n=108) and was <6.0mg/L 68 times (63% of the measurements overall, including measurements taken at the surface and at an average depth of 0.7m) and <5.0mg/L 25 times (23% of the measurements overall). The one measurement taken at BBC_HM3 in 2016 was 6.1mg/L, which suggests that conditions may improve moving further out into the cove. Nutrient sampling efforts (ebb tides in July and August at BBC_HM1 and HM3, n=27 with a maximum of 1.26mg/L at BBC_HM1 in 2018) documented seasonal average total nitrogen concentrations between 0.47-0.88mg/L. Chlorophyll *a* concentrations (n=39) were often >10µg/L at BBC_HM1 (60% of the samples at that location), with a maximum of 51.14µg/L in 2018; though only once was >10µg/L at BBC_HM3 (where the maximum was 16.01µg/L in 2018), which again suggests an improvement in conditions moving further out into the cove. Secchi disk depth average depths ranged from 0.6-1.0m for the “inner finger” areas of the AU but improved to a range of 1.3-1.4m further out into the cove (at BBC_HM3). Ammonia-nitrogen concentrations were generally low, (range 0.004 to 0.03mg/L (n=39)), though TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for Hammett Cove (MA95-56) will continue to be assessed as Not Supporting, based on the loss of eelgrass bed habitat documented by the MassDEP between 1995 and 2017 and the water quality data collected by the BBC staff/volunteers in 2015-2019 which are indicative of poor conditions; with the Estuarine Bioassessments and Total Nitrogen impairments being carried forward. A new impairment for Nutrient/Eutrophication Biological Indicators is being added due to the elevated chlorophyll *a* (an additional primary producer biological screening parameter) and low dissolved oxygen concentrations (both additional evidence of nutrient enrichment), documented in the inner cove by the BBC in 2015-2019.

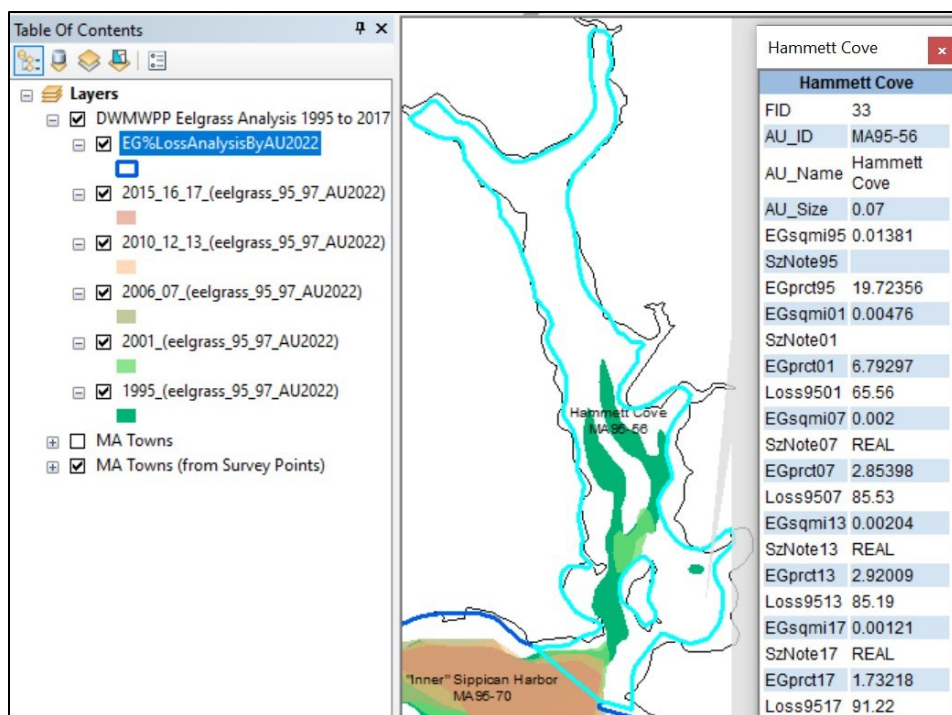
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_HM0	Buzzards Bay Coalition	Water Quality	Sippican Harbor	Hammett Cove, Marion	41.720546	-70.758981
BBC_HM1	Buzzards Bay Coalition	Water Quality	Sippican Harbor	Hammett Cove, Marion	41.721208	-70.756305
BBC_HM3	Buzzards Bay Coalition	Water Quality	Sippican Harbor	Hammett Cove, Marion	41.713394	-70.756277

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Hammett Cove MA95-56 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~91% loss of eelgrass bed habitat in Hammett Cove between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_HM0	07/05/16	07/05/16	0.2	1	5.4	5.4	100	0	0
BBC_HM1	05/28/15	09/23/15	0.1	18	2.0	5.0	72	33	11
BBC_HM1	06/16/15	09/14/15	0.8	11	3.3	5.1	91	36	9
BBC_HM1	05/31/16	09/21/16	0.2	12	2.0	5.4	42	25	8
BBC_HM1	06/06/16	09/17/16	0.6	13	3.5	5.4	69	23	8
BBC_HM1	06/21/17	09/13/17	0.2	10	2.5	4.7	100	40	10
BBC_HM1	06/07/17	09/21/17	0.7	10	4.0	5.4	70	20	0
BBC_HM1	06/11/18	09/16/18	0.2	9	4.5	5.6	56	11	0
BBC_HM1	06/11/18	09/19/18	0.7	5	5.0	6.1	20	0	0
BBC_HM1	06/15/19	09/19/19	0.2	7	5.0	6.0	29	0	0
BBC_HM1	06/04/19	09/19/19	0.6	11	4.5	6.2	45	18	0
BBC_HM3	07/05/16	07/05/16	0.2	1	6.1	6.1	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_HM0	07/05/16	07/05/16	0.2	1	1	24.3	24.3	0
BBC_HM1	05/28/15	09/23/15	0.1	22	20	28.0	23.7	0
BBC_HM1	06/16/15	09/14/15	0.8	11	11	26.2	23.3	0
BBC_HM1	05/31/16	09/21/16	0.2	15	12	28.5	23.2	0
BBC_HM1	06/06/16	09/17/16	0.6	12	11	27.0	23.2	0
BBC_HM1	06/21/17	09/13/17	0.2	14	14	27.0	23.0	0
BBC_HM1	06/07/17	09/21/17	0.7	10	9	27.0	21.1	0
BBC_HM1	06/11/18	09/16/18	0.2	11	10	27.0	23.9	0
BBC_HM1	06/11/18	09/19/18	0.8	6	5	27.0	23.4	0
BBC_HM1	06/15/19	09/19/19	0.2	11	10	26.0	24.3	0
BBC_HM1	06/04/19	09/19/19	0.6	11	10	29.0	24.4	0
BBC_HM3	07/13/15	08/25/15	0.2	4	4	28.0	24.8	0
BBC_HM3	07/05/16	08/15/16	0.2	4	4	28.0	26.4	0
BBC_HM3	07/06/17	08/17/17	0.2	4	4	27.0	24.2	0
BBC_HM3	07/24/18	08/21/18	0.2	2	2	26.0	24.5	0
BBC_HM3	07/11/19	08/15/19	0.2	4	4	26.0	25.3	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_HM1	2015	0.2	2	0.49	0.70	0.60	4	8.01	16.21	11.93	0	3
BBC_HM1	2016	0.2	4	0.56	0.75	0.65	4	6.07	17.75	10.50	0	2
BBC_HM1	2017	0.2	3	0.56	0.67	0.64	4	4.98	16.12	8.83	1	1
BBC_HM1	2018	0.2	3	0.69	1.26	0.88	4	11.11	51.14	30.19	0	4
BBC_HM1	2019	0.2	4	0.45	0.67	0.58	4	7.57	13.97	10.18	0	2
BBC_HM3	2015	0.2	1	0.59	0.59	0.59	4	5.99	6.82	6.22	0	0
BBC_HM3	2016	0.2	2	0.59	0.60	0.60	4	4.17	6.42	5.38	2	0
BBC_HM3	2017	0.2	3	0.45	0.55	0.48	4	3.42	8.29	5.34	2	0
BBC_HM3	2018	0.2	2	0.45	0.46	0.46	3	6.54	16.01	9.76	0	1
BBC_HM3	2019	0.2	3	0.46	0.50	0.47	4	5.77	8.14	7.23	0	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_HM0	07/05/16	07/05/16	1	0.6	0.6	0.6
BBC_HM1	06/16/15	09/14/15	8	0.6	1.3	0.9
BBC_HM1	06/06/16	08/31/16	6	0.5	1.2	0.8
BBC_HM1	07/21/17	09/21/17	5	0.6	1.2	1.0
BBC_HM1	06/28/18	08/07/18	4	0.6	1.1	0.9

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_HM1	06/15/19	09/11/19	4	0.8	1.2	1.0
BBC_HM3	07/13/15	08/25/15	3	1.2	1.4	1.3
BBC_HM3	07/05/16	08/15/16	4	1.2	1.5	1.4
BBC_HM3	07/06/17	08/17/17	4	1.2	1.6	1.4
BBC_HM3	07/24/18	08/21/18	3	1.2	1.5	1.3
BBC_HM3	08/08/19	08/15/19	2	1.2	1.4	1.3

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_HM1	07/13/15	08/25/15	0.2	4	0.010	0.013	0.012
BBC_HM1	07/05/16	08/15/16	0.2	4	0.007	0.031	0.015
BBC_HM1	07/06/17	08/17/17	0.2	4	0.004	0.027	0.013
BBC_HM1	07/10/18	08/21/18	0.2	4	0.004	0.014	0.008
BBC_HM1	07/11/19	08/15/19	0.2	4	0.009	0.019	0.013
BBC_HM3	07/13/15	08/25/15	0.2	4	0.009	0.019	0.012
BBC_HM3	07/05/16	08/15/16	0.2	4	0.006	0.016	0.011
BBC_HM3	07/06/17	08/17/17	0.2	4	0.004	0.010	0.006
BBC_HM3	07/24/18	08/21/18	0.2	3	0.004	0.006	0.005
BBC_HM3	07/11/19	08/15/19	0.2	4	0.004	0.014	0.007

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Hammett Cove (MA95-56); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Hammett Cove (MA95-56): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0701 sq mi (95%). The approved shellfish growing area represents 0.0538 sq mi (73%). The prohibited shellfish growing area represents 0.0162 sq mi (22%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area \geq 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as Not Supporting.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB32.01	Point Road/Hammett's Cove	Approved	0.05381	73.0%
BB32.3	Hammetts Cove	Prohibited	0.01625	22.1%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Hammett Cove (MA95-56) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
One Marion beach (Oakdale Avenue (ID 2946) was almost never posted for swimming between 2014 and 2019. The Primary Contact Recreational Use for Hammett Cove (MA95-56) is assessed as Fully Supporting, since there were few if any swimming advisory postings at the Oakdale Avenue beach between 2014 and 2019.	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2946	Oakdale Avenue/Marion	41.71926	-70.75860	41.71908	-70.75860	2%	0%	1%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Hammett Cove (MA95-56): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0701 sq mi (95%). The approved shellfish growing area represents 0.0538 sq mi (73%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	

One Marion beach (Oakdale Avenue (ID 2946) was almost never posted for swimming between 2014 and 2019. The Secondary Contact Recreational Use for Hammett Cove (MA95-56) is assessed as Fully Supporting, since there were few if any swimming advisory postings at the Oakdale Avenue beach between 2014 and 2019.

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary

Hammett Cove (MA95-56): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0701 sq mi (95%). The approved shellfish growing area represents 0.0538 sq mi (73%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Harbor Head (MA95-46)

Location:	The semi-enclosed body of water south of the confluence with West Falmouth Harbor, south of Chappaquoit Road, Falmouth.
AU Type:	ESTUARY
AU Size:	0.02 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Estuarine Bioassessments	34284	Unchanged
4a	4a	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Impervious Surface/Parking Lot Runoff (Y)	X					
Estuarine Bioassessments	Municipal Point Source Discharges (Y)	X					
Estuarine Bioassessments	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Estuarine Bioassessments	Residential Districts (Y)	X					
Fecal Coliform	Source Unknown (N)			X			

Recommendations

2022 Recommendations
ALU: Conduct additional monitoring for nutrient enrichment indicators on summer ebb tides for the Harbor Head AU (MA95-46) including at least three samples per year for total nitrogen, so seasonal averages can be calculated as per CALM requirements as well as additional DO monitoring.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at one location in Harbor Head, Falmouth (MA95-46) in the summers of 2015 to 2019, near the most seaward end of the AU near Chapoquidit Road (BBC_WF4N). Monitoring was conducted in surface waters usually weekly (between the hours of 6 and 9am). The maximum temperature was 27.7°C (n=17). The minimum dissolved oxygen (DO) was 3.5mg/L (n=16); <6.0mg/L 12 times (~75% of the measurements overall) and <5.0mg/L four times (~25% of the measurements overall). Total nitrogen sampling (n=9, maximum 0.59mg/L) during ebb tides in July and August documented a seasonal average total nitrogen concentration of 0.48mg/L in 2015 (the only year when n≥3). The maximum Chlorophyll *a* was 13.6µg/L (n=17); >5µg/L 14 times and >10µg/L three times (18%). Secchi disk depths in the summers of 2015, 2017, 2018, and 2019 ranged from 1.2 to 1.7m (n=8) and ammonia-nitrogen concentrations were low (range 0.004 to 0.03mg/L, n=17), but TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for Harbor Head (MA95-46) will continue to be assessed as Not Supporting with the Estuarine Bioassessments impairment being carried forward. An Alert for low DO is being added.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_WF4N	Buzzards Bay Coalition	Water Quality	West Falmouth Harbor	West Falmouth Mid-Harbor, Falmouth	41.59831	-70.64239

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_WF4N	07/13/15	08/25/15	0.2	4	3.5	4.7	100	50	25
BBC_WF4N	07/05/16	08/15/16	0.2	4	5.4	6.7	50	0	0
BBC_WF4N	07/06/17	08/17/17	0.2	3	4.9	6.0	67	33	0
BBC_WF4N	07/10/18	08/21/18	0.2	3	4.8	5.5	67	33	0
BBC_WF4N	07/25/19	08/15/19	0.2	2	5.8	5.8	100	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_WF4N	07/13/15	08/25/15	0.2	4	4	25.5	24.1	0
BBC_WF4N	07/05/16	08/15/16	0.2	4	4	27.7	26.0	0
BBC_WF4N	07/06/17	08/17/17	0.2	3	3	26.0	24.8	0
BBC_WF4N	07/10/18	08/21/18	0.2	4	4	25.1	24.3	0
BBC_WF4N	07/25/19	08/15/19	0.2	2	2	24.2	24.0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_WF4N	2015	0.2	3	0.43	0.52	0.48	4	3.23	13.60	9.63	1	2
BBC_WF4N	2016	0.2	2	0.35	0.45	0.40	4	5.07	8.60	6.48	0	0
BBC_WF4N	2017	0.2	2	0.47	0.48	0.48	3	3.50	8.03	6.21	1	0
BBC_WF4N	2018	0.2	1	0.54	0.54	0.54	4	3.53	10.64	8.16	1	1
BBC_WF4N	2019	0.2	1	0.59	0.59	0.59	2	6.98	8.58	7.78	0	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_WF4N	07/27/15	08/10/15	2	1.4	1.5	1.4
BBC_WF4N	08/17/17	08/17/17	1	1.2	1.2	1.2
BBC_WF4N	07/24/18	08/21/18	3	1.3	1.7	1.5
BBC_WF4N	07/25/19	08/15/19	2	1.2	1.5	1.4

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_WF4N	07/13/15	08/25/15	0.2	4	0.007	0.030	0.014
BBC_WF4N	07/05/16	08/15/16	0.2	4	0.004	0.007	0.006
BBC_WF4N	07/06/17	08/17/17	0.2	3	0.004	0.008	0.006
BBC_WF4N	07/10/18	08/21/18	0.2	4	0.004	0.006	0.004
BBC_WF4N	07/25/19	08/15/19	0.2	2	0.004	0.004	0.004

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Harbor Head (MA95-46); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

Harbor Head (MA95-46): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0172 sq mi (78%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is <100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB54.2	West Falmouth Harbor	Restricted	0.01715	78.0%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Harbor Head (MA95-46) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Harbor Head (MA95-46) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Harbor Head (MA95-46): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0172 sq mi (78%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Harbor Head (MA95-46) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Harbor Head (MA95-46): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0172 sq mi (78%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Herring Brook (MA95-21)

Location:	Estuarine portion northeast of Dale Drive and west of Route 28A, Falmouth to the mouth at Buzzards Bay, Falmouth.
AU Type:	ESTUARY
AU Size:	0.01 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Chlorophyll-a		Unchanged
5	5	Fecal Coliform	36172	Unchanged
5	5	Nitrogen, Total		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Chlorophyll-a	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Source Unknown (N)	X					

Recommendations

2022 Recommendations
AES: Conduct monitoring in Herring Brook (MA95-21) to better evaluate aesthetics quality conditions making specific notes on odors, deposits, growths, and turbidity.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in Herring Brook, Falmouth (MA95-21) in the summers 2015 to 2019 as follows: at the uppermost reach area (BBC_HB4), midway on the southern shore (BBC_HB3), and just downstream of Quaker Rd near the mouth of the brook (BBC_HB2). Monitoring was conducted in the surface waters at all locations as well as deeper in the water column at BBC_HB2 (at average depths ranging from 0.4 to 0.9m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 27°C (n=126). The minimum dissolved oxygen (DO) (most data at BBC_HB2) was 2.0mg/L (n=114); <6.0mg/L 35 times (~31% of the measurements overall with the excursions spread fairly evenly throughout the AU at the surface and at depth) and <5.0mg/L 19 times (~17% of the measurements overall). These low DO concentrations are likely related to natural conditions consistent with those of a shallow salt marsh tidal creek. Total nitrogen sampling (n=43, maximum 1.49mg/L) during ebb tides in July and August documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.39-1.05mg/L (eight of 10 of the seasonal average calculations were >0.5mg/L, with highest averages documented at furthest upstream (BBC_HB4)). The maximum chlorophyll *a* was 103.52µg/L (n=32); >5µg/L 19 times and >10µg/L seven times (22%). The Secchi disk depth at BBC_HB2 was 1.3m. Ammonia-nitrogen concentrations ranged from 0.004 to 0.122mg/L (n=44), but TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for Herring Brook (MA95-21) will continue to be assessed as Not Supporting based on the data collected by BBC staff/volunteers in the summers of 2015 through 2019 with the Chlorophyll *a* and Total Nitrogen impairments both being carried forward. The low DO is considered to be related to natural conditions consistent with those of a shallow salt marsh tidal creek.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_HB2	Buzzards Bay Coalition	Water Quality	Herring Brook	Herring Brook, Falmouth	41.623896	-70.639078
BBC_HB3	Buzzards Bay Coalition	Water Quality	Herring Brook Marsh	Herring Brook Marsh, Falmouth	41.623028	-70.633754
BBC_HB4	Buzzards Bay Coalition	Water Quality	Herring Brook Marsh	Herring Brook Marsh, Falmouth	41.622537	-70.63095

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_HB2	06/09/15	09/22/15	0.1	12	2.0	6.3	33	33	17
BBC_HB2	06/16/15	08/29/15	0.4	4	5.0	6.8	25	0	0
BBC_HB2	06/07/16	09/01/16	0.2	15	3.4	6.4	20	7	7
BBC_HB2	07/21/16	09/20/16	0.7	4	6.2	6.6	0	0	0
BBC_HB2	06/06/17	09/06/17	0.2	11	4.0	6.1	55	36	0
BBC_HB2	06/06/17	09/06/17	0.5	13	5.0	6.4	46	0	0
BBC_HB2	06/05/18	09/11/18	0.2	14	3.0	7.1	14	7	7
BBC_HB2	06/11/18	09/20/18	0.5	8	4.8	7.3	13	13	0
BBC_HB2	06/27/19	09/05/19	0.2	11	3.6	5.7	55	45	9
BBC_HB2	07/03/19	09/23/19	0.5	7	5.3	6.6	14	0	0
BBC_HB3	07/05/16	08/01/16	0.2	2	5.7	6.0	50	0	0
BBC_HB3	07/06/17	08/17/17	0.1	2	5.8	7.5	50	0	0
BBC_HB4	07/05/16	08/01/16	0.2	2	5.9	6.3	50	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_HB4	07/06/17	08/17/17	0.1	3	6.4	9.0	0	0	0
BBC_HB4	07/10/18	08/21/18	0.1	4	2.1	9.1	25	25	25
BBC_HB4	07/25/19	08/08/19	0.2	2	4.7	5.6	50	50	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_HB2	06/09/15	09/22/15	0.1	16	14	26.0	22.3	0
BBC_HB2	06/16/15	08/29/15	0.4	4	4	25.5	22.4	0
BBC_HB2	06/07/16	09/01/16	0.1	16	16	27.0	22.4	0
BBC_HB2	07/21/16	09/20/16	0.9	4	3	25.6	24.7	0
BBC_HB2	06/06/17	09/06/17	0.1	11	11	24.7	21.0	0
BBC_HB2	06/06/17	09/06/17	0.5	13	13	24.7	21.4	0
BBC_HB2	06/05/18	09/11/18	0.2	15	15	25.6	21.6	0
BBC_HB2	06/11/18	09/20/18	0.5	9	8	24.2	21.0	0
BBC_HB2	06/27/19	09/05/19	0.2	12	12	25.1	20.9	0
BBC_HB2	07/03/19	09/23/19	0.5	7	6	25.1	22.3	0
BBC_HB3	07/27/15	08/10/15	0.1	2	2	20.0	19.5	0
BBC_HB3	07/05/16	08/01/16	0.1	3	3	21.6	21.4	0
BBC_HB3	07/06/17	08/17/17	0.1	2	2	20.2	18.5	0
BBC_HB4	07/13/15	08/25/15	0.1	4	4	20.0	18.0	0
BBC_HB4	07/05/16	08/01/16	0.1	3	3	21.8	19.9	0
BBC_HB4	07/06/17	08/17/17	0.1	3	3	18.3	15.8	0
BBC_HB4	07/10/18	08/21/18	0.1	4	4	21.2	17.9	0
BBC_HB4	07/11/19	08/08/19	0.2	3	3	18.9	18.5	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)
Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_HB2	2015	0.1	4	0.34	0.45	0.39	4	4.20	6.11	5.23	2	0
BBC_HB2	2016	0.1	4	0.35	0.80	0.54	4	2.59	6.60	4.53	3	0
BBC_HB2	2017	0.2	4	0.44	0.66	0.52	4	2.32	10.62	5.99	2	1
BBC_HB2	2018	0.1	4	0.48	0.63	0.53	4	2.21	7.79	4.21	3	0
BBC_HB2	2019	0.1	4	0.45	0.90	0.61	4	2.85	9.38	5.08	3	0
BBC_HB3	2015	0.1	2	0.51	0.58	0.54	2	4.36	10.30	7.33	1	1
BBC_HB3	2016	0.1	3	0.40	0.60	0.48	3	2.63	5.60	3.72	2	0
BBC_HB3	2017	0.1	2	0.56	0.59	0.58	2	3.14	7.17	5.16	1	0
BBC_HB4	2015	0.1	4	0.68	1.49	1.05	4	7.46	62.38	29.98	0	3

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_HB4	2016	0.1	3	0.40	0.65	0.52	3	3.14	4.83	3.81	3	0
BBC_HB4	2017	0.1	3	0.72	1.49	1.00	3	2.52	103.52	36.61	2	1
BBC_HB4	2018	0.1	4	0.70	0.78	0.74	4	4.49	12.19	7.35	1	1
BBC_HB4	2019	0.2	2	0.71	0.88	0.79	3	1.19	8.10	4.16	2	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_HB2	09/06/17	09/06/17	1	1.3	1.3	1.3

Toxics and other pollutants (metals, ammonia, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_HB2	07/13/15	08/25/15	0.1	4	0.021	0.034	0.025
BBC_HB2	07/05/16	08/15/16	0.1	4	0.018	0.061	0.036
BBC_HB2	07/06/17	08/17/17	0.2	4	0.014	0.057	0.030
BBC_HB2	07/10/18	08/21/18	0.1	4	0.026	0.043	0.033
BBC_HB2	07/11/19	08/15/19	0.1	4	0.011	0.040	0.026
BBC_HB3	07/27/15	08/10/15	0.1	2	0.029	0.072	0.051
BBC_HB3	07/05/16	08/01/16	0.1	3	0.025	0.122	0.061
BBC_HB3	07/06/17	08/17/17	0.1	2	0.044	0.057	0.051
BBC_HB4	07/13/15	08/25/15	0.1	4	0.010	0.053	0.023
BBC_HB4	07/05/16	08/01/16	0.1	3	0.020	0.034	0.026
BBC_HB4	07/06/17	08/17/17	0.1	3	0.004	0.029	0.015
BBC_HB4	07/10/18	08/21/18	0.1	4	0.008	0.030	0.022
BBC_HB4	07/11/19	08/08/19	0.2	3	0.004	0.042	0.028

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Herring Brook (MA95-21); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

Herring Brook (MA95-21): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.006 sq mi (49%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.006 sq mi (49%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting. The Alert for bacteria is not needed so is being removed.

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB51.0	North Falmouth Outer Harbor	Approved	0.00001	0.1%
BB53.0	Herring Brook	Prohibited	0.00603	48.9%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Herring Brook (MA95-21) so it is Not Assessed. An Alert is being identified, however, due to intermittent observations of “rusty red water or lots of particles”, noted at the innermost sampling site in Herring Brook by BBC staff/volunteers between 2015 and 2019.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Herring Brook (MA95-21) so it is Not Assessed. An Alert is being identified, however, due to intermittent observations of “rusty red water or lots of particles”, noted at the innermost sampling site in Herring Brook by BBC staff/volunteers between 2015 and 2019.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Herring Brook (MA95-21): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.006 sq mi (49%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Herring Brook (MA95-21) so it is Not Assessed. An Alert is being identified, however, due to intermittent observations of “rusty red water or lots of particles”, noted at the innermost sampling site in Herring Brook by BBC staff/volunteers between 2015 and 2019.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Herring Brook (MA95-21): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.006 sq mi (49%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Hiller Cove (MA95-10)

Location:	The water landward of a line drawn between Joes Point, Mattapoisett and the second boat dock northeast of Hiller Cove Lane, Mattapoisett.
AU Type:	ESTUARY
AU Size:	0.04 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	5	Estuarine Bioassessments		Added
4a	5	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			

Recommendations

2022 Recommendations
ALU: Conduct additional monitoring for nutrient enrichment indicators on summer ebb tides for the Hiller Cove AU (MA95-10). Be sure to get at least three samples per year for total nitrogen so seasonal averages can be calculated as per CALM requirements.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an ~38% loss of eelgrass bed habitat in Hiller Cove between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at two locations in Hiller Cove (MA95-10) in the summers of 2015-2019, from the inner to outer cove as follows: BBC_HL2X and BBC_HL2N, both within a few hundred feet of Aucoot Beach. Monitoring was conducted in the surface water at BBC_HL2X and at an average depth of 0.7m at BBC_HL2N and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 29.0°C (n=110) and though the minimum dissolved oxygen (DO) was 4.8mg/L (n=110), the measurements were <6.0mg/L only 6 times (5.5% of the measurements overall) and <5.0mg/L only once at BBC_HL2N in 2016. The BBC typically scheduled chlorophyll *a* sampling efforts for ebb tides in July and August at BBC_HL2N (no total nitrogen data were collected for this AU) and though the data were limited (n=16), the maximum concentration was 5.9µg/L. The BBC also measured Secchi disk depth (0.7 to 1.3m, n=4). Ammonia-nitrogen concentrations were generally low, (range 0.004 to 0.06mg/L (n=16)), but TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for Hiller Cove (MA95-10) is assessed as Not Supporting based on the loss of Eelgrass Bed habitat documented by the MassDEP Eelgrass Mapping Project between 1995 and 2017. An impairment for Estuarine Bioassessments is being added.

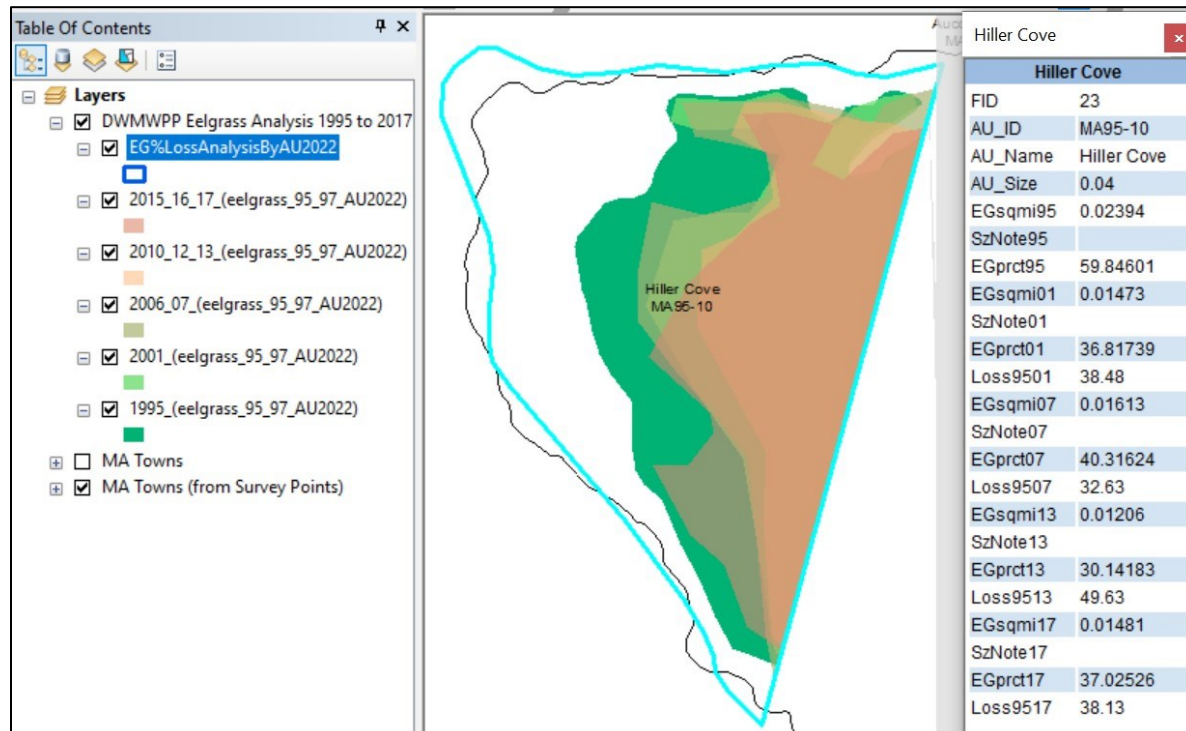
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_HL2N	Buzzards Bay Coalition	Water Quality	Hillers Cove	Hillers Cove, Mattapoisett	41.666483	-70.761257
BBC_HL2X	Buzzards Bay Coalition	Water Quality	Hillers Cove	Hillers Cove, Mattapoisett	41.666972	-70.761957

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Hiller Cove MA95-10 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~38% loss of eelgrass bed habitat in Hiller Cove between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_HL2N	08/15/16	08/15/16	0.2	1	4.8	4.8	100	100	0
BBC_HL2X	05/27/15	09/23/15	0.7	22	5.5	7.0	5	0	0
BBC_HL2X	05/31/16	09/25/16	0.7	22	5.5	6.9	5	0	0
BBC_HL2X	05/31/17	09/21/17	0.7	21	6.0	7.0	0	0	0
BBC_HL2X	05/29/18	09/20/18	0.7	22	5.0	6.8	14	0	0
BBC_HL2X	05/31/19	09/23/19	0.7	22	6.5	7.8	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_HL2N	07/13/15	08/25/15	0.2	3	3	25.0	23.8	0
BBC_HL2N	08/15/16	08/15/16	0.2	1	1	25.9	25.9	0
BBC_HL2N	07/06/17	08/17/17	0.2	4	4	25.0	23.7	0
BBC_HL2N	07/10/18	08/21/18	0.2	4	4	29.0	24.8	0
BBC_HL2N	07/11/19	08/15/19	0.2	4	4	22.0	21.9	0
BBC_HL2X	05/27/15	09/23/15	0.7	22	19	25.0	20.9	0
BBC_HL2X	05/31/16	09/25/16	0.7	22	18	27.0	23.0	0
BBC_HL2X	05/31/17	09/21/17	0.7	22	19	26.0	22.2	0
BBC_HL2X	05/29/18	09/20/18	0.7	22	19	26.0	22.2	0
BBC_HL2X	05/31/19	09/23/19	0.7	22	19	26.0	22.0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_HL2N	2015	0.2	--	--	--	--	3	1.76	2.93	2.50	3	0
BBC_HL2N	2016	0.2	--	--	--	--	1	1.29	1.29	1.29	1	0
BBC_HL2N	2017	0.2	--	--	--	--	4	2.40	3.49	3.11	4	0
BBC_HL2N	2018	0.2	--	--	--	--	4	1.40	4.14	3.06	4	0
BBC_HL2N	2019	0.2	--	--	--	--	4	1.33	5.90	4.19	2	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_HL2N	07/24/18	07/24/18	1	1.3	1.3	1.3
BBC_HL2N	08/08/19	08/15/19	2	0.8	1.0	0.9
BBC_HL2X	09/05/17	09/05/17	1	0.7	0.7	0.7

Toxics and other pollutants (metals, ammonia, chlorine)**Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_HL2N	07/13/15	08/25/15	0.2	3	0.009	0.010	0.009
BBC_HL2N	08/15/16	08/15/16	0.2	1	0.004	0.004	0.004
BBC_HL2N	07/06/17	08/17/17	0.2	4	0.004	0.066	0.020
BBC_HL2N	07/10/18	08/21/18	0.2	4	0.004	0.004	0.004
BBC_HL2N	07/11/19	08/15/19	0.2	4	0.004	0.004	0.004

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Hiller Cove (MA95-10); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Hiller Cove (MA95-10): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0372 sq mi (95%). The approved shellfish growing area represents 0.0327 sq mi (84%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications**MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB30.0	Hiller Cove	Approved	0.03272	83.5%
BB30.1	Hiller Cove Brook	Conditionally Approved	0.00445	11.4%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	

No data are available to assess the status of the Aesthetic Use for Hiller Cove (MA95-10) so it is Not Assessed.

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There is one beach in Hiller Cove, Mattapoisett (MA95-10) known as "Aucoot" (ID 5412) and it was never posted for swimming between 2014 and 2019.</p> <p>The Primary Contact Recreational Use for Hiller Cove (MA95-10) is assessed as Fully Supporting, since there were no swimming advisory postings at the Aucoot Beach between 2014 and 2019.</p>	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
5412	Aucoot/Mattapoisett	41.66610	-70.76220	41.66750	-70.76190	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
<p>Hiller Cove (MA95-10): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0372 sq mi (95%). The approved shellfish growing area represents 0.0327 sq mi (84%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.</p>

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There is one beach in Hiller Cove, Mattapoisett (MA95-10) known as "Aucoot" (ID 5412) and it was never posted for swimming between 2014 and 2019.</p> <p>The Secondary Contact Recreational Use for Hiller Cove (MA95-10) is assessed as Fully Supporting, since there were no swimming advisory postings at the Aucoot Beach between 2014 and 2019.</p>	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
<p>Hiller Cove (MA95-10): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0372 sq mi (95%). The approved shellfish growing area represents 0.0327 sq mi (84%). Because the total of all shellfish growing area classifications is anything less than "approved", the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.</p>

Horseneck Channel (MA95-87)

Location:	From the outlet of The Let to the confluence with the East Branch Westport River (east of Route 88), Westport.
AU Type:	ESTUARY
AU Size:	0.24 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	2	None		Unchanged

Designated Use Attainment Decisions

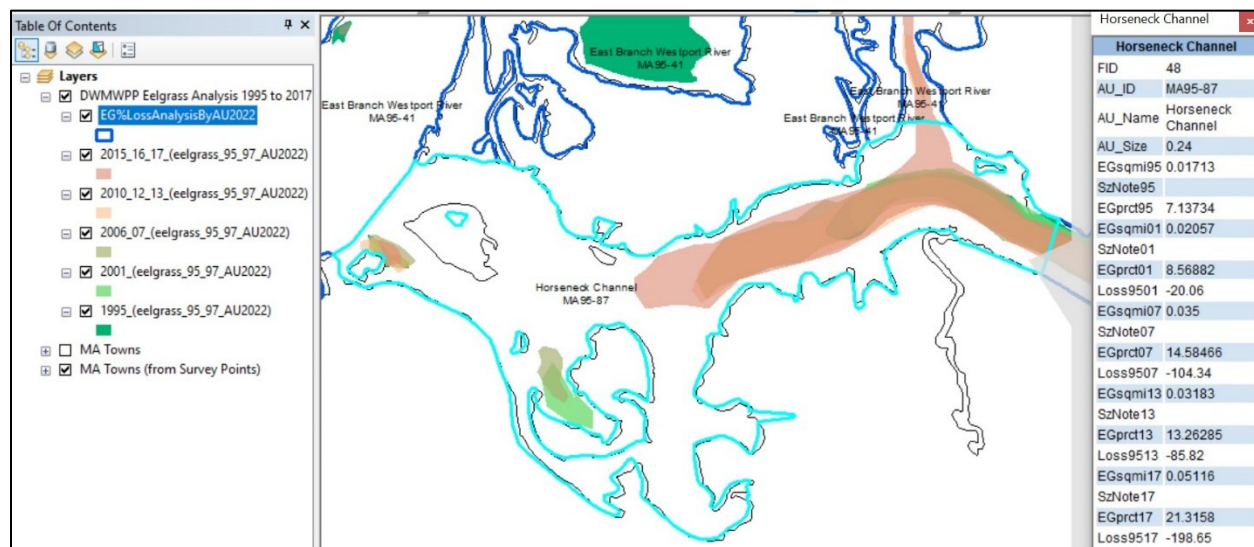
Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary The MassDEP Eelgrass Mapping Project documented an increase (~200%) of eelgrass bed habitat in Horseneck Channel between 1995 and 2017 (0.017 miles ² to 0.05 miles ² , respectively). The Aquatic Life Use for Horseneck Channel (MA95-87) will continue to be assessed as Fully Supporting based on the increase of eelgrass bed habitat documented between 1995 and 2017.	

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Horseneck Channel MA95-87 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an increase of eelgrass bed habitat in Horseneck Channel between 1995 and 2017 (0.017 miles² to 0.05 miles², respectively).

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Horseneck Channel (MA95-87); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
Horseneck Channel (MA95-87): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2138 sq mi (91%). The approved shellfish growing area represents 0.2138 sq mi (91%). The Shellfish Harvesting Use is assessed as fully supporting because the growing area (normalized to the AU area) is classified as 100% approved.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB4.0	Horseneck Channel & The Let	Approved	0.21380	90.9%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Horseneck Channel (MA95-87) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within Horseneck Channel (MA95-87) is 0.2138 sq mi (91%). The approved shellfish growing area represents 0.2138 sq mi (91%). The Primary Contact Recreational Use for Horseneck Channel is assessed as Fully Supporting since the shellfish growing area (normalized to the AU area) is classified as 100% approved.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Horseneck Channel (MA95-87): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2138 sq mi (91%). The approved shellfish growing area represents 0.2138 sq mi (91%). The Primary Contact Recreational Use is assessed as fully supporting because the growing area (normalized to the AU area) is classified as 100% approved, unless other data are available that contradict this use attainment decision.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within Horseneck Channel (MA95-87) is 0.2138 sq mi (91%). The approved shellfish growing area represents 0.2138 sq mi (91%).</p> <p>The Secondary Contact Recreational Use for Horseneck Channel is assessed as Fully Supporting since the shellfish growing area (normalized to the AU area) is classified as 100% approved.</p>	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
<p>Horseneck Channel (MA95-87): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2138 sq mi (91%). The approved shellfish growing area represents 0.2138 sq mi (91%). The Secondary Contact Recreational use is assessed as fully supporting because the growing area (normalized to the AU area) is classified as 100% approved, unless other data are available that contradict this use attainment decision.</p>

Horseshoe Pond (MA95075)

Location:	Wareham.
AU Type:	FRESHWATER LAKE
AU Size:	59 ACRES
Classification/Qualifier:	B: WWF, HQW

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Insufficient Information	YES
2022 Use Attainment Summary	
According to DMF biologists, one structure in Horseshoe Pond was noted to be of minimal impact to the passage of the targeted species, river herring and rainbow smelt (population score 5) between the pond and the downstream Weweantic River AU (MA95-05). The remnants of the Horseshoe Pond Dam (NATID# MA00026) (dam removed in 2020), located just upstream of Station Street, was given a passage score of "0" on a 0-10 scale (with 10 equating to no possible passage). This score indicates that the remnants of the dam are not an obstruction to the passage of diadromous fish. Too limited data are available to evaluate the Aquatic Life Use for Horseshoe Pond (MA95075) so it is assessed as having Insufficient Information. The prior Alert identified due to the presence of <i>M. heterophyllum</i> in the Tremont Hill impoundment of the Weweantic River (1995 synoptic survey) as well as the somewhat elevated total phosphorus concentrations documented in the river just upstream from Horseshoe Pond (2005 data) is being carried forward.	

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
According to DMF biologists, one structure in Horseshoe Pond was noted to be of minimal impact to the passage of the targeted species, river herring and rainbow smelt (population score of "5") between the pond and the downstream Weweantic River AU (MA95-05). The remnants of the Horseshoe Pond Dam (NATID# MA00026), located just upstream of Station Street, was given a passage score of "0" on a 0-10 scale (with 10 equating to no possible passage). This score indicates that the remnants of the dam are not an obstruction to the passage of diadromous fish. DMF biologists noted that the dam had been removed in 2020.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Horseshoe Pond (MA95075); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Horseshoe Pond (MA95075) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for Horseshoe Pond (MA95075) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Horseshoe Pond (MA95075) so it is Not Assessed.	

Kings Pond (MA95078)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	22 ACRES
Classification/Qualifier:	B

No usable data were available for Kings Pond (MA95078) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

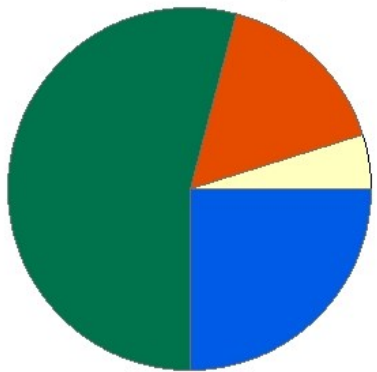
2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Kirby Brook (MA95-82)

Location:	Headwaters just south of Old County Road, Westport to the mouth at East Branch Westport River, Westport.
AU Type:	RIVER
AU Size:	2 MILES
Classification/Qualifier:	B

KIRBY BROOK - MA95-82

Watershed Area: 3.83 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.83	3.79	1.45	1.45
Agriculture	4.8%	4.9%	2.6%	2.6%
Developed	16%	16.2%	8.3%	8.3%
Natural	54.2%	53.7%	49.9%	49.9%
Wetland	25%	25.2%	39.2%	39.2%
Impervious Cover	6.2%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Enterococcus		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Enterococcus	Source Unknown (N)				X	

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	

MassDEP staff did not observe any dense film or filamentous algae in Kirby Brook at Drift Rd Westport (W1374) during either summer survey conducted in summer 2012 as part of the MassDEP Bacteria Source Tracking (BST) project. There are insufficient data available to evaluate the Aquatic Life Use for Kirby Brook so it is assessed as having Insufficient Information.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1374	MassDEP	Water Quality	Kirby Brook	[Drift Road, Westport]	41.600502	-71.073371

Physico-chemical Water Quality Information

Nutrients (Primary Producer Screening, Physico-chemical Screening)

MassDEP Nutrient Enrichment Indicator Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	Delta DO Max (mg/L)	Delta DO Avg (mg/L)	DO Sat Max (%)	pH Max (SU)	Count Algal Obsv.	Dense/V. Dense Film/Fila. Algae
W1374	2012	--	--	--	--	--	--	--	--	2	0

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Kirby Brook (MA95-82); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	
MassDEP staff surveyed Kirby Brook at Drift Rd, Westport (W1374) during the summer of 2012 as part of the BST project (n=2): No objectionable conditions (i.e., odors, deposits, growths, or turbidity) were observed during either of the surveys. Too limited data are available to evaluate the Aesthetics Use for Kirby Brook so it is assessed as having Insufficient Information.	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1374	MassDEP	Water Quality	Kirby Brook	[Drift Road, Westport]	41.600502	-71.073371

Aesthetic Observations

Aesthetics Summary Statements for MassDEP Stations (2011-2018) (MassDEP Undated6)

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W1374	Kirby Brook	2012	2	MassDEP aesthetics observations for station W1374 on Kirby Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2012. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2).

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W1374	2012	2	2	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W1374	Kirby Brook	2012	Color	None	2	2
W1374	Kirby Brook	2012	Objectionable Deposits	Not Applicable (N/A)	2	2
W1374	Kirby Brook	2012	Odor	None	2	2
W1374	Kirby Brook	2012	Scum	Not Applicable (N/A)	2	2
W1374	Kirby Brook	2012	Turbidity	None	1	2
W1374	Kirby Brook	2012	Turbidity	Slightly Turbid	1	2

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>UMass Dartmouth volunteers collected <i>Enterococci</i> bacteria data and MassDEP staff collected <i>E. coli</i> bacteria data (as part of the BST project) on this Kirby Brook AU (MA95-82) just upstream of Drift Road, Westport (UMassD_12) between June and September 2019 (n=15) and just downstream of Drift Road, Westport (W1374) between June and September 2012 (n=2). Analysis of the UMass dataset (single year high frequency <i>Enterococcus</i>) indicated that 75% of the intervals at site UMassD_12 had GMs >35 cfu/100 ml, however the available <i>E. coli</i> data at W1374 were too limited to assess the Primary Contact Recreational Use according to the CALM "Use Attainment Impairment Decision Schema".</p> <p>The Primary Contact Recreation Use for Kirby Brook (MA95-82) will continue to be assessed as Not Supporting based on the elevated <i>Enterococci</i> bacteria concentrations documented at Drift Rd by UMass Dartmouth in 2019. The <i>Enterococcus</i> impairment is being carried forward.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1374	MassDEP	Water Quality	Kirby Brook	[Drift Road, Westport]	41.600502	-71.073371
UMassD_12	UMass Dartmouth	Water Quality	Kirby Brook	420 Drift Road, Westport, MA.	41.600612	-71.073411

*Bacteria Data***Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (MassDEP

Undated11) (MassDEP Undated6) (UMass-Dartmouth 2019) (MassDEP Undated4)

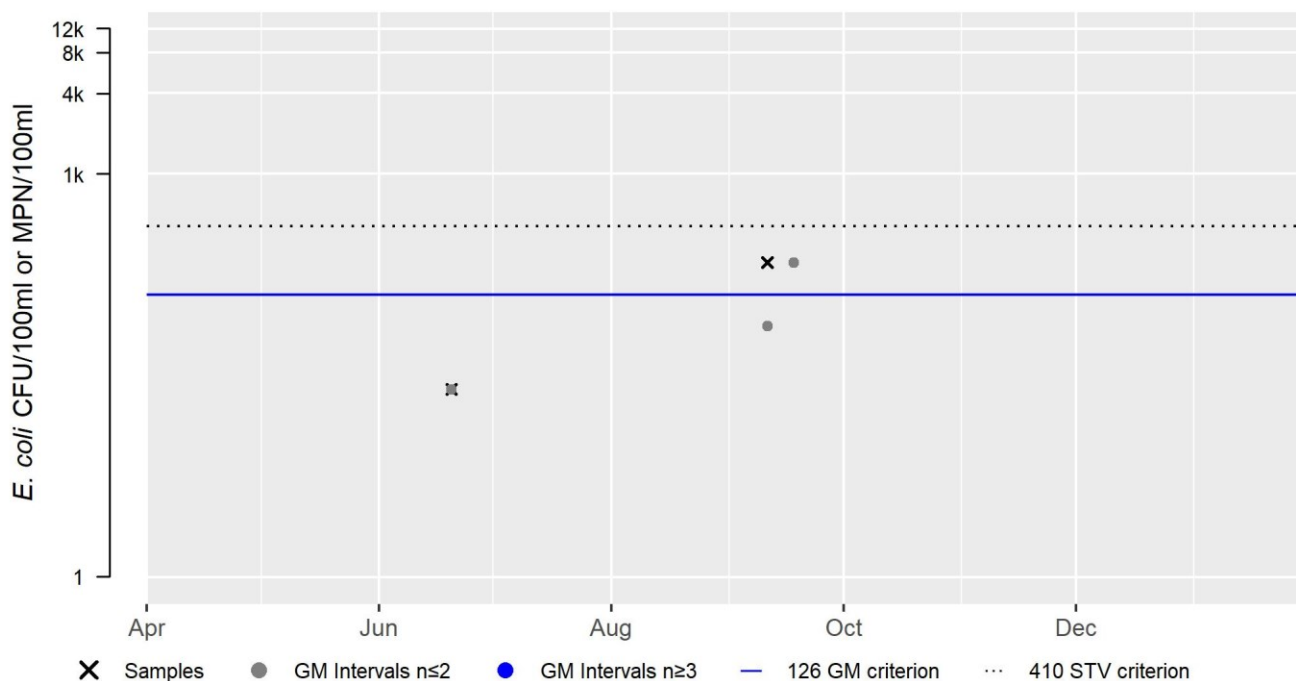
[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
W1374	MassDEP	E. coli	06/20/12	09/11/12	2	25	219	74
UMassD_12	UMass Dartmouth	Enterococci	06/18/19	09/23/19	15	1	1046	93

W1374 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	74
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

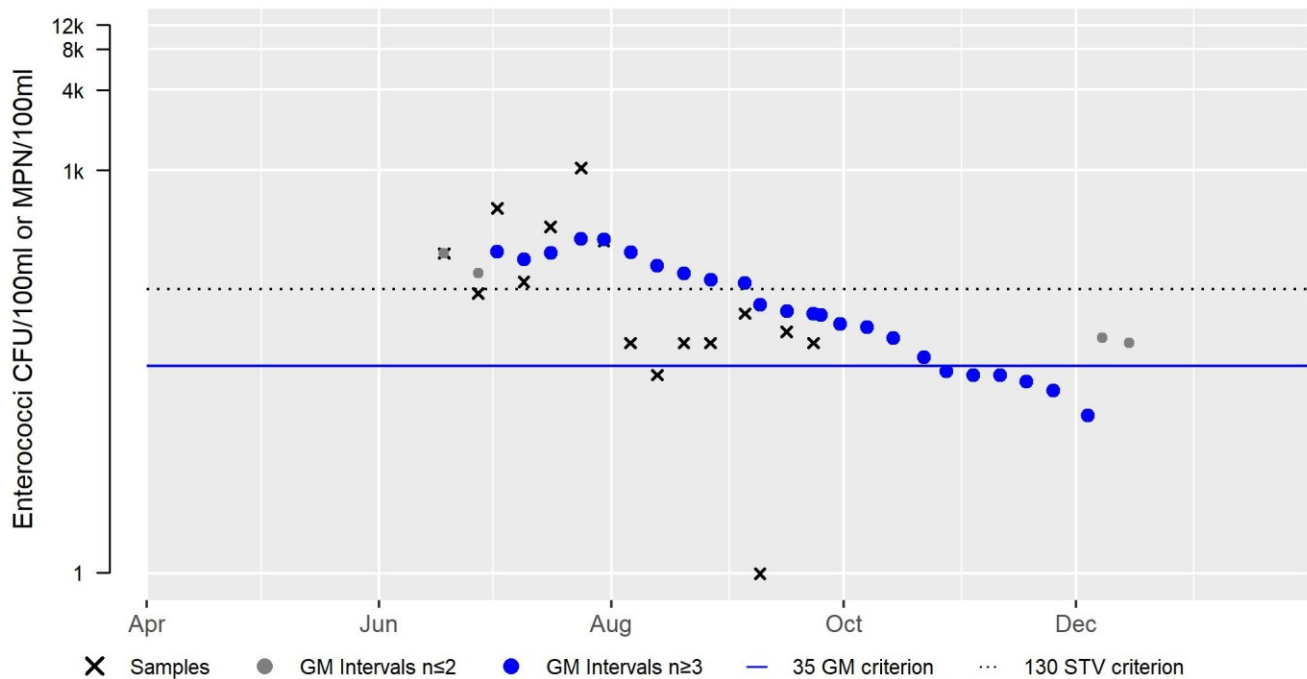
2012

UMassD_12 Enterococci (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	15
SeasGM	93
#GMI	24
#GMI Ex	18
%GMI Ex	75
n>STV	6
%n>STV	40

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2019



Secondary Contact Recreation

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	
MassDEP staff collected <i>E. coli</i> bacteria data (as part of the BST project) on this Kirby Brook AU (MA95-82) just downstream of Drift Road, Westport (W1374) between June and September 2012 (n=2). Too limited <i>E. coli</i> data are available to evaluate the Secondary Contact Recreational Use for Kirby Brook so it is assessed as having Insufficient Information.	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W1374	MassDEP	Water Quality	Kirby Brook	[Drift Road, Westport]	41.600502	-71.073371

*Bacteria Data***Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (MassDEP

Undated11) (MassDEP Undated6)

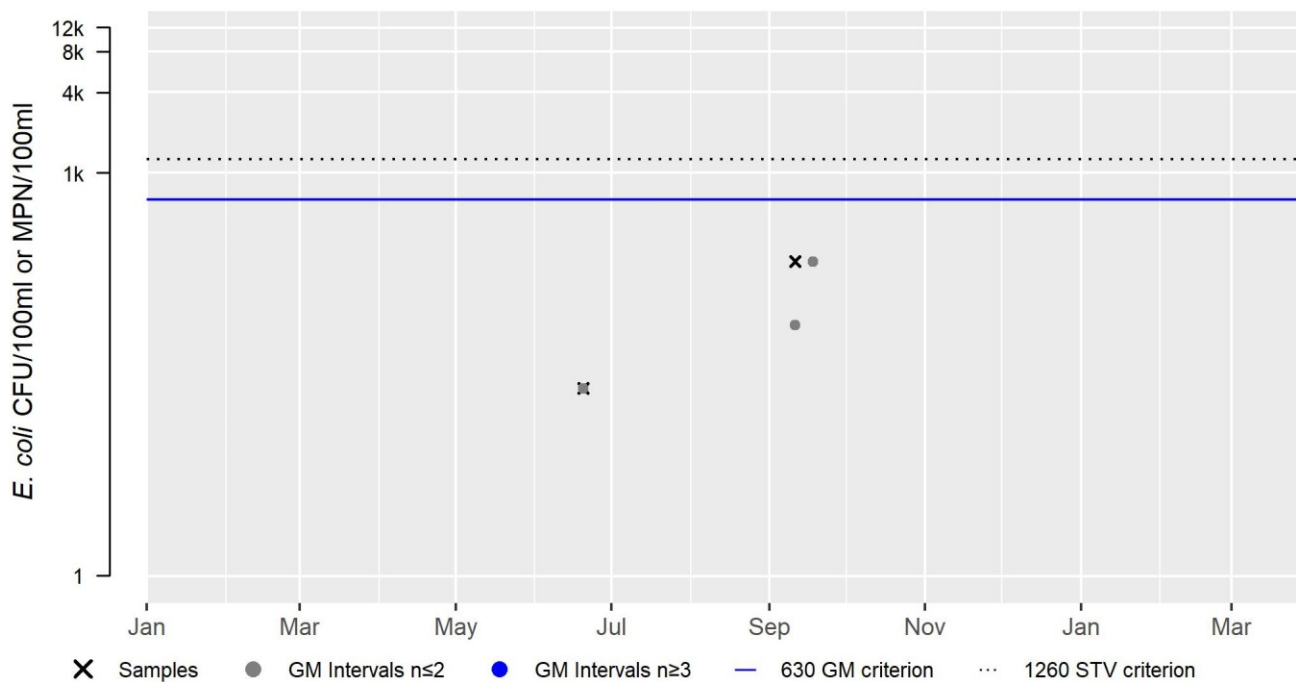
[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
W1374	MassDEP	E. coli	06/20/12	09/11/12	2	25	219	74

W1374 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	74
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2012

Leonards Pond (MA95080)

Location:	Rochester.
AU Type:	FRESHWATER LAKE
AU Size:	49 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Aquatic Plants (Macrophytes)*)		Unchanged
5	5	(Curly-leaf Pondweed*)		Added
5	5	(Non-Native Aquatic Plants*)		Unchanged
5	5	Chlorophyll-a		Unchanged
5	5	Transparency / Clarity		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Aquatic Plants (Macrophytes)*)	Agriculture (N)			X	X	X
(Aquatic Plants (Macrophytes)*)	Source Unknown (N)			X	X	X
(Curly-leaf Pondweed*)	Introduction of Non-native Organisms (Accidental or Intentional) (N)	X				
(Non-Native Aquatic Plants*)	Introduction of Non-native Organisms (Accidental or Intentional) (N)	X				
Chlorophyll-a	Agriculture (N)	X		X	X	X
Chlorophyll-a	Source Unknown (N)	X		X	X	X
Transparency / Clarity	Agriculture (N)	X		X	X	X
Transparency / Clarity	Source Unknown (N)	X		X	X	X

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

DMF biologists note one potential barrier providing adequate passage to the passage of diadromous fish between Leonards Pond and the downstream Sippican River AU (MA95-06). The Leonards Pond Dam (NATID# MA00369) (with existing fishway) was given a passage score of "2", on a 0-10 scale, indicating that the dam is only a minor obstruction to the passage of the targeted species, river herring and American eel. The population score was 2. DMF noted that construction of the fishway was completed in 2011. MassDEP staff reported infestations of the non-native aquatic macrophytes, variable milfoil (*Myriophyllum heterophyllum*) and curly-leaf pondweed (*Potamogeton crispus*), in Leonards Pond during the 2005 field season.

The Aquatic Life Use for Leonards Pond (MA95080) will continue to be assessed as Not Supporting. Since no new/recent information is available to reevaluate the chlorophyll *a* and transparency/clarity impairments are being carried forward. The Non-Native Aquatic Plants impairment (for *Myriophyllum heterophyllum*) is also being carried forward (due to the infestation of variable milfoil) and a Curly-leaf Pondweed impairment for is being added.

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note one potential barrier providing adequate passage to the passage of diadromous fish between Leonards pond and the downstream Sippican river (MA95-06). The Leonards Pond Dam (NATID# MA00369) (with existing fishway) was given a passage score of "2", on a 0-10 scale, indicating that the dam is only a minor obstruction to the passage of the targeted species, river herring and American eel. The population score was noted to be "2". DMF noted that construction of the fishway was completed in 2011.

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP Undated1)

Summary Statement
MassDEP staff reported infestations of the non-native aquatic macrophytes, variable milfoil (<i>Myriophyllum heterophyllum</i>) and curly-leaf pondweed (<i>Potamogeton crispus</i>), in Leonards Pond during the 2005 field season.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Leonards Pond (MA95080); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No new data are available to assess the status of the Aesthetic Use for Leonards Pond (MA95080), so it will continue to be assessed as Not Supporting with the Aquatic Plants (Macrophytes), Chlorophyll- <i>a</i> , and Transparency/Clarity impairments all being carried forward.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

No *Enterococci* or *E.coli* bacteria data are available to assess the status of the Primary Contact Recreation Use for Leonards Pond (MA95080) so it will continue to be assessed as Not Supporting, with the Aquatic Plants (Macrophytes), Chlorophyll-*a*, and Transparency/Clarity impairments all being carried forward.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the status of the Secondary Contact Recreation Use for Leonards Pond (MA95080) so it will continue to be assessed as Not Supporting with the Aquatic Plants (Macrophytes), Chlorophyll- <i>a</i> , and Transparency/Clarity impairments all being carried forward.	

Little Bay (MA95-64)

Location:	From the confluence with the Nasketucket River, Fairhaven south to the confluence with Nasketucket Bay at a line from the southernmost tip of Mirey Neck, Fairhaven (~latitude 41.625702, ~longitude 70.854045) to a point of land near Shore Drive (~latitude 41.621994, ~longitude 70.855415), Fairhaven.
AU Type:	ESTUARY
AU Size:	0.33 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary <p>The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at six locations throughout Little Bay, Fairhaven (MA95-64) in the summers of 2015 to 2019, from inner to outer as follows: BBC_LT1X, LT1N, LT3, LT2A, LT2N, and LT2X. Three sample stations, BBC_LT1X, LT2A, and LT2X, were close to shore (from jetties, docks, or beaches) while the other three sites were further out into the bay. Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at most stations (at average depths ranging 0.4m at BBC_LT1X to 1.3m at BBC_LT3) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 28.0°C (n=191). The minimum dissolved oxygen (DO) was 4.0mg/L (n=197); <6.0mg/L 32 times (16% of the measurements overall usually ~1-3 times per year throughout the bay) and <5.0mg/L only once. Total nitrogen sampling (n=18, maximum 0.72mg/L at BBC_LT2X in 2019) during ebb tides in June through September documented seasonal average total nitrogen concentrations for sites/year with n>2 samples of 0.29 and 0.55mg/L at BBC_LT2X, in 2017 and 2019, respectively (note this site is very near shore so has limited spatial representation for the AU overall and was also where both concentrations >0.5mg/L were documented). The maximum chlorophyll <i>a</i> was 18.4µg/L (n=46); >5µg/L 15 times and >10µg/L twice. Secchi disk depths ranged from 1.2 to 3.4m throughout the bay (n=13). Ammonia-nitrogen concentrations ranged from 0.004 to 0.1mg/L (n=47), though TUs could not be calculated (lack of quality assured pH and salinity data).</p> <p>The Aquatic Life Use for Little Bay (MA95-64) will continue to be assessed as Fully Supporting based on the water quality data collected by BBC staff/volunteers throughout the Bay between 2015 and 2019 which are indicative of generally good conditions although an Alert for DO is being identified.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_LT1N	Buzzards Bay Coalition	Water Quality	Little Bay	Little Bay, Fairhaven	41.632461	-70.863239
BBC_LT1X	Buzzards Bay Coalition	Water Quality	Little Bay	Little Bay, Fairhaven	41.63315	-70.866716
BBC_LT2A	Buzzards Bay Coalition	Water Quality	Little Bay	Little Bay, Fairhaven	41.624726	-70.860701
BBC_LT2N	Buzzards Bay Coalition	Water Quality	Little Bay	Little Bay, Fairhaven	41.625011	-70.857531
BBC_LT2X	Buzzards Bay Coalition	Water Quality	Little Bay	Little Bay, Fairhaven	41.623808	-70.859209
BBC_LT3	Buzzards Bay Coalition	Water Quality	Little Bay	Little Bay, Fairhaven	41.627439	-70.860331

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_LT1N	07/13/15	08/25/15	0.2	4	5.6	5.8	50	0	0
BBC_LT1N	07/13/15	08/25/15	0.8	4	5.5	5.8	75	0	0
BBC_LT1N	07/18/16	07/18/16	0.2	1	6.2	6.2	0	0	0
BBC_LT1X	06/04/15	09/18/15	0.2	16	5.5	7.6	6	0	0
BBC_LT1X	06/04/15	09/14/15	0.4	12	5.0	7.4	8	0	0
BBC_LT1X	07/20/16	08/02/16	0.2	2	6.0	6.5	0	0	0
BBC_LT1X	06/06/16	09/17/16	0.4	11	6.0	7.0	0	0	0
BBC_LT1X	07/03/17	09/16/17	0.2	8	5.0	6.4	13	0	0
BBC_LT1X	06/06/17	09/20/17	0.6	7	5.0	6.0	14	0	0
BBC_LT1X	06/14/18	09/19/18	0.2	5	5.5	6.3	40	0	0
BBC_LT1X	05/30/18	09/12/18	0.5	10	5.5	6.7	20	0	0
BBC_LT1X	06/20/19	09/24/19	0.2	5	6.5	7.1	0	0	0
BBC_LT1X	05/30/19	09/14/19	0.5	11	6.0	7.2	0	0	0
BBC_LT2A	06/01/16	09/26/16	0.2	4	6.0	7.0	0	0	0
BBC_LT2A	01/09/17	09/18/17	0.2	3	7.4	8.9	0	0	0
BBC_LT2N	07/13/15	08/25/15	0.2	4	5.7	6.2	50	0	0
BBC_LT2N	07/13/15	08/25/15	1.0	4	5.7	6.2	75	0	0
BBC_LT2N	07/18/16	07/18/16	0.2	1	6.7	6.7	0	0	0
BBC_LT2X	06/16/15	09/24/15	0.1	19	4.0	7.7	11	5	0
BBC_LT2X	01/06/16	08/31/16	0.2	10	6.0	7.8	0	0	0
BBC_LT2X	06/06/17	09/05/17	0.2	15	6.5	7.0	0	0	0
BBC_LT2X	07/09/18	09/01/18	0.2	10	5.5	6.2	20	0	0
BBC_LT2X	05/31/19	09/22/19	0.2	21	5.0	6.8	14	0	0
BBC_LT2X	07/01/19	07/01/19	0.5	1	6.0	6.0	0	0	0
BBC_LT3	07/13/15	08/25/15	0.2	4	5.9	6.2	50	0	0
BBC_LT3	07/13/15	08/25/15	1.3	4	5.8	6.1	75	0	0
BBC_LT3	07/18/16	07/18/16	0.2	1	6.6	6.6	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_LT1N	07/13/15	08/25/15	0.2	4	4	26.3	24.6	0
BBC_LT1N	07/13/15	08/25/15	0.8	4	4	26.3	24.6	0
BBC_LT1N	07/18/16	08/15/16	0.2	2	2	28.0	27.5	0
BBC_LT1N	07/06/17	07/06/17	0.2	1	1	25.1	25.1	0
BBC_LT1N	07/06/17	07/06/17	0.8	1	1	25.3	25.3	0
BBC_LT1N	07/10/18	08/07/18	0.2	2	2	27.3	25.4	0
BBC_LT1X	06/04/15	09/18/15	0.2	16	15	25.0	22.3	0
BBC_LT1X	06/04/15	09/14/15	0.5	11	11	25.0	21.9	0
BBC_LT1X	07/20/16	08/02/16	0.2	2	2	25.0	23.8	0
BBC_LT1X	06/06/16	09/17/16	0.4	11	10	27.0	23.0	0
BBC_LT1X	07/03/17	09/16/17	0.2	8	7	26.3	23.0	0
BBC_LT1X	06/06/17	09/20/17	0.5	7	6	24.0	21.0	0
BBC_LT1X	06/14/18	09/19/18	0.2	5	4	26.9	23.8	0
BBC_LT1X	05/30/18	09/12/18	0.5	9	8	26.8	22.8	0
BBC_LT1X	06/20/19	09/24/19	0.1	5	3	26.0	22.0	0
BBC_LT1X	05/30/19	09/14/19	0.5	11	10	26.0	20.9	0
BBC_LT2A	06/01/16	09/26/16	0.2	4	3	23.3	20.5	0
BBC_LT2A	01/09/17	09/18/17	0.2	3	1	14.4	14.4	0
BBC_LT2N	07/13/15	08/25/15	0.2	4	4	26.1	24.4	0
BBC_LT2N	07/13/15	08/25/15	1.0	4	4	26.0	24.3	0
BBC_LT2N	07/18/16	08/15/16	0.2	2	2	27.0	26.4	0
BBC_LT2N	07/06/17	07/06/17	0.2	1	1	24.3	24.3	0
BBC_LT2N	07/10/18	08/07/18	0.2	2	2	27.1	25.1	0
BBC_LT2X	06/16/15	09/24/15	0.1	19	16	26.0	23.6	0
BBC_LT2X	01/06/16	08/31/16	0.2	10	8	27.0	24.5	0
BBC_LT2X	06/06/17	09/05/17	0.2	15	15	24.0	21.0	0
BBC_LT2X	07/09/18	09/01/18	0.2	10	10	25.8	23.8	0
BBC_LT2X	05/31/19	09/22/19	0.2	23	21	26.5	22.0	0
BBC_LT2X	07/01/19	07/01/19	0.5	1	1	20.8	20.8	0
BBC_LT3	07/13/15	08/25/15	0.2	4	4	26.4	24.5	0
BBC_LT3	07/13/15	08/25/15	1.3	4	4	26.3	24.5	0
BBC_LT3	07/18/16	08/15/16	0.2	2	2	27.0	26.5	0
BBC_LT3	07/06/17	07/06/17	0.2	1	1	24.5	24.5	0
BBC_LT3	07/10/18	08/07/18	0.2	2	2	27.3	25.3	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)**Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_LT1N	2015	0.2	2	0.33	0.47	0.40	4	3.45	5.89	4.86	2	0
BBC_LT1N	2015	1.0	--	--	--	--	1	4.86	4.86	4.86	1	0
BBC_LT1N	2016	0.2	--	--	--	--	2	5.01	18.38	11.70	1	1
BBC_LT1N	2017	0.2	--	--	--	--	1	5.24	5.24	5.24	0	0
BBC_LT1N	2017	0.8	--	--	--	--	1	6.77	6.77	6.77	0	0
BBC_LT1N	2018	0.2	2	0.44	0.48	0.46	2	3.01	6.22	4.62	1	0
BBC_LT2A	2016	0.2	1	0.30	0.30	0.30	4	1.87	4.36	2.76	4	0
BBC_LT2A	2017	0.2	1	0.33	0.33	0.33	3	2.43	2.81	2.63	3	0
BBC_LT2N	2015	0.2	--	--	--	--	3	3.78	4.39	4.16	3	0
BBC_LT2N	2015	1.1	--	--	--	--	1	6.10	6.10	6.10	0	0
BBC_LT2N	2016	0.2	1	0.35	0.35	0.35	2	5.24	7.89	6.57	0	0
BBC_LT2N	2017	0.2	--	--	--	--	1	6.64	6.64	6.64	0	0
BBC_LT2N	2018	0.2	1	0.35	0.35	0.35	2	2.84	4.76	3.80	2	0
BBC_LT2X	2015	0.2	3	0.23	0.33	0.29	3	4.17	5.45	4.60	2	0
BBC_LT2X	2016	0.2	--	--	--	--	1	1.57	1.57	1.57	1	0
BBC_LT2X	2017	0.2	2	0.48	0.70	0.59	3	2.59	4.92	4.09	3	0
BBC_LT2X	2019	0.2	3	0.37	0.72	0.55	3	3.99	12.35	8.28	1	1
BBC_LT3	2015	0.2	1	0.31	0.31	0.31	4	3.47	7.52	5.01	3	0
BBC_LT3	2016	0.2	--	--	--	--	2	3.30	4.19	3.75	2	0
BBC_LT3	2017	0.2	--	--	--	--	1	5.71	5.71	5.71	0	0
BBC_LT3	2018	0.2	1	0.37	0.37	0.37	2	3.34	4.86	4.10	2	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_LT1N	07/18/16	07/18/16	1	1.7	1.7	1.7
BBC_LT2A	06/01/16	09/12/16	2	2.4	2.8	2.6
BBC_LT2A	01/09/17	09/18/17	2	3.1	3.4	3.3
BBC_LT2N	07/18/16	07/18/16	1	2.0	2.0	2.0
BBC_LT2N	07/10/18	07/10/18	1	1.2	1.2	1.2
BBC_LT2X	06/16/15	09/24/15	3	1.5	2.3	2.0
BBC_LT3	08/25/15	08/25/15	1	1.8	1.8	1.8
BBC_LT3	07/18/16	07/18/16	1	2.3	2.3	2.3
BBC_LT3	07/10/18	07/10/18	1	1.2	1.2	1.2

Toxics and other pollutants (metals, ammonia, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_LT1N	07/13/15	08/25/15	0.2	4	0.006	0.012	0.009
BBC_LT1N	08/25/15	08/25/15	1.0	1	0.014	0.014	0.014
BBC_LT1N	07/18/16	08/15/16	0.2	2	0.004	0.005	0.005
BBC_LT1N	07/06/17	07/06/17	0.2	1	0.005	0.005	0.005
BBC_LT1N	07/06/17	07/06/17	0.8	1	0.004	0.004	0.004
BBC_LT1N	07/10/18	08/07/18	0.2	2	0.008	0.023	0.015
BBC_LT2A	06/01/16	09/26/16	0.2	4	0.004	0.006	0.005
BBC_LT2A	01/09/17	09/18/17	0.2	3	0.004	0.011	0.008
BBC_LT2N	07/13/15	08/25/15	0.2	3	0.007	0.010	0.008
BBC_LT2N	07/27/15	07/27/15	1.1	1	0.006	0.006	0.006
BBC_LT2N	07/18/16	08/15/16	0.2	2	0.006	0.007	0.006
BBC_LT2N	07/06/17	07/06/17	0.2	1	0.005	0.005	0.005
BBC_LT2N	07/10/18	08/07/18	0.2	2	0.004	0.005	0.004
BBC_LT2X	06/16/15	09/24/15	0.2	3	0.005	0.010	0.009
BBC_LT2X	01/06/16	03/08/16	0.2	2	0.007	0.009	0.008
BBC_LT2X	06/06/17	09/05/17	0.2	3	0.004	0.105	0.041
BBC_LT2X	07/25/19	08/15/19	0.2	3	0.004	0.018	0.009
BBC_LT3	07/13/15	08/25/15	0.2	4	0.006	0.012	0.010
BBC_LT3	07/18/16	08/15/16	0.2	2	0.004	0.007	0.005
BBC_LT3	07/06/17	07/06/17	0.2	1	0.007	0.007	0.007
BBC_LT3	07/10/18	08/07/18	0.2	2	0.004	0.007	0.005

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Little Bay (MA95-64); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Little Bay (MA95-64): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.324 sq mi (98%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is <100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB22.1	Nasketucket River and Approach	Prohibited	0.01695	5.1%
BB22.2	Ashley Island Road North	Conditionally Approved	0.04290	12.9%
BB22.3	Little Bay	Conditionally Approved	0.26419	79.7%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Little Bay (MA95-64) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There are two beaches in Little Bay, Fairhaven (MA95-64); the names and ID codes for the beaches are as follows: Sandy Beach (Raymond Street) (ID 2821) and Knollmere (ID 5210). The beaches were either rarely or never posted with advisories for swimming between 2014 and 2019.</p> <p>The Primary Contact Recreational Use for Little Bay (MA95-64) is assessed as Fully Supporting since there were rarely, if any, swimming advisory postings at either the Sandy (Raymond Street) or Knollmere beaches between 2014 and 2019.</p>	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2821	Sandy Beach (Raymond Street)/Fairhaven	41.62368	-70.85930	41.62368	-70.85810	0%	0%	0%	0%	0%	1%	0
5210	Knollmere/Fairhaven	41.63453	-70.86020	41.63413	-70.85930	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
<p>Little Bay (MA95-64): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.324 sq mi (98%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.</p>

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There are two beaches in Little Bay, Fairhaven (MA95-64); the names and ID codes for the beaches are as follows: Sandy Beach (Raymond Street) (ID 2821) and Knollmere (ID 5210). The beaches were either rarely or never posted with advisories for swimming between 2014 and 2019.</p> <p>The Secondary Contact Recreational Use for Little Bay (MA95-64) is assessed as Fully Supporting since there were rarely, if any, swimming advisory postings at either the Sandy (Raymond Street) or Knollmere beaches between 2014 and 2019.</p>	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Little Bay (MA95-64): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.324 sq mi (98%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Little Buttermilk Bay (MA95-76)

Location:	off of Buttermilk Bay, Bourne.
AU Type:	ESTUARY
AU Size:	0.16 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Estuarine Bioassessments		Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)	X					

Recommendations

2022 Recommendations
ALU: Continue to conduct total nitrogen sampling (at least three times per season at mid-ebb tide) as well as primary producer biological screening and DO measurements, to confirm the extent of continuing nutrient enrichment impairments for this Little Buttermilk Bay AU (MA95-76). Monitor the AU for improvements.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented a complete loss of ~0.066mi² of eelgrass bed habitat in Little Buttermilk Bay after 1995 (none mapped since). The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at two locations in Little Buttermilk Bay, Bourne (MA95-76) in the summers of 2015 to 2019, from inner to outer as follows: close to the middle of the bay (BBC_LB2N) and close to shore at the north end of the bay near “Head of the Bay Rd” (BBC_LB2X). Monitoring was conducted in the surface waters at both locations, as well as deeper in the water column at BBC_LB2X (at average depths ranging from 1.3 to 1.5m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 27°C (n=193). The minimum dissolved oxygen (DO), only monitored at BBC_LB2X, was 5.0mg/L (n=205); <6.0mg/L primarily in 2016 and 2017 though infrequently. Total nitrogen sampling (n=10, maximum 0.74mg/L in 2019) during ebb tides in July and/or August documented a seasonal average total nitrogen concentration for sites/year with n>2 samples of 0.44mg/L (in 2015 at BBC_LB2N). The maximum chlorophyll *a* was 14.87µg/L (n=19); >5µg/L 15 times and >10µg/L usually once a year. Secchi disk depths (at both locations) ranged from 0.9 to 1.8m and ammonia-nitrogen concentrations were low (range 0.004 to 0.03mg/L, n=19), but TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for Little Buttermilk Bay (MA95-76) will continue to be assessed as Not Supporting. Given the loss of eelgrass bed habitat documented by the MassDEP Eelgrass Mapping Project between since 1995 and the water quality data collected by BBC staff/volunteers in 2015-2019, the Estuarine Bioassessments and Nutrient/Eutrophication Biological Indicators impairments are both being carried forward.

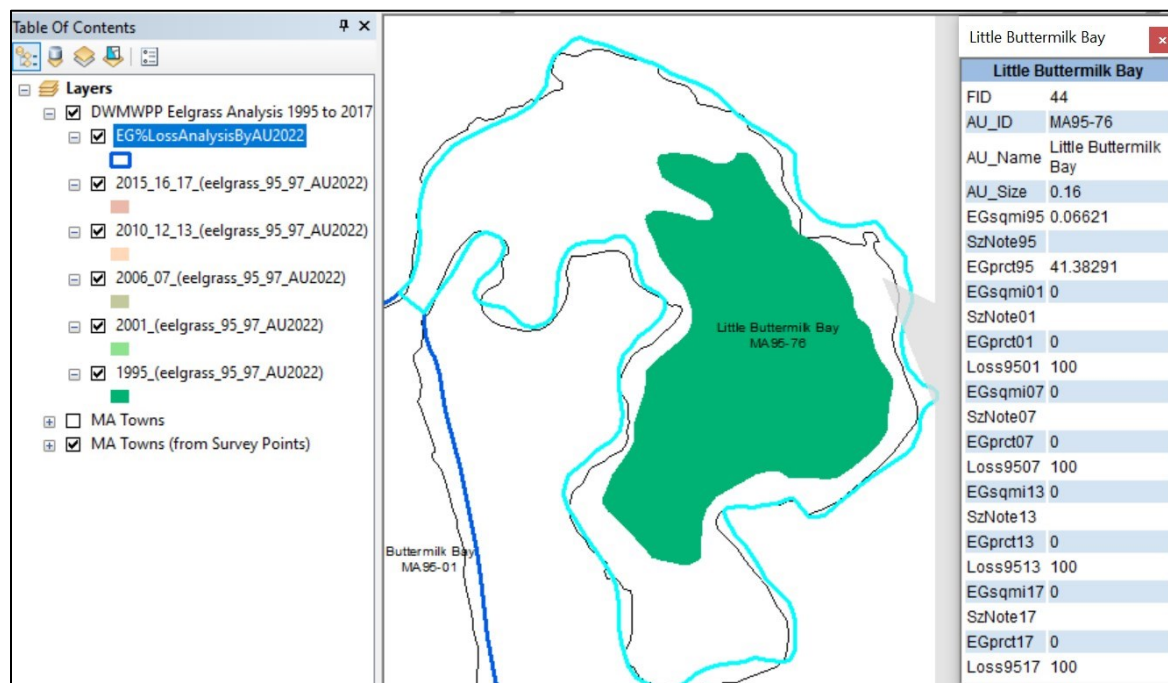
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_LB2N	Buzzards Bay Coalition	Water Quality	Buttermilk Bay	Little Buttermilk Bay, Bourne	41.763725	-70.605309
BBC_LB2X	Buzzards Bay Coalition	Water Quality	Buttermilk Bay	Little Buttermilk Bay, Bourne	41.766308	-70.610264

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Little Buttermilk Bay MA95-76 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented a complete loss of eelgrass bed habitat in Little Buttermilk Bay after 1995.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_LB2X	05/29/15	09/23/15	0.2	20	6.0	7.1	0	0	0
BBC_LB2X	05/29/15	09/23/15	1.3	20	6.0	7.3	0	0	0
BBC_LB2X	05/31/16	09/24/16	0.2	21	5.0	6.6	10	0	0
BBC_LB2X	05/31/16	09/24/16	1.3	21	5.0	6.8	10	0	0
BBC_LB2X	05/31/17	09/19/17	0.2	20	5.0	6.4	25	0	0
BBC_LB2X	05/31/17	09/19/17	1.3	22	5.0	6.6	9	0	0
BBC_LB2X	05/30/18	09/19/18	0.2	18	6.0	6.7	0	0	0
BBC_LB2X	05/30/18	09/19/18	1.3	21	5.5	6.8	5	0	0
BBC_LB2X	05/30/19	09/24/19	0.2	21	6.0	7.1	0	0	0
BBC_LB2X	05/30/19	09/24/19	1.5	21	6.0	7.3	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_LB2N	07/13/15	08/25/15	0.2	4	4	20.5	19.3	0
BBC_LB2N	07/18/16	08/15/16	0.2	3	3	27.0	23.7	0
BBC_LB2N	07/06/17	08/17/17	0.2	4	4	27.0	24.3	0
BBC_LB2N	07/10/18	08/21/18	0.2	4	4	26.0	24.9	0
BBC_LB2N	07/11/19	08/15/19	0.2	4	4	24.0	23.0	0
BBC_LB2X	05/29/15	09/23/15	0.2	20	17	21.0	18.5	0
BBC_LB2X	05/29/15	09/23/15	1.3	20	17	21.0	18.5	0
BBC_LB2X	05/31/16	09/24/16	0.2	19	15	26.0	21.0	0
BBC_LB2X	05/31/16	09/24/16	1.4	19	15	26.0	21.1	0
BBC_LB2X	05/31/17	09/19/17	0.2	21	18	26.0	21.2	0
BBC_LB2X	05/31/17	09/19/17	1.3	22	19	25.0	21.1	0
BBC_LB2X	05/30/18	09/19/18	0.2	18	16	25.0	22.1	0
BBC_LB2X	05/30/18	09/19/18	1.3	21	19	26.0	22.0	0
BBC_LB2X	05/30/19	09/24/19	0.2	21	19	25.0	20.8	0
BBC_LB2X	05/30/19	09/24/19	1.5	21	19	25.0	20.8	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_LB2N	2015	0.2	4	0.40	0.49	0.44	4	6.71	14.87	9.52	0	1
BBC_LB2N	2016	0.2	2	0.51	0.56	0.54	3	8.72	10.66	9.52	0	1
BBC_LB2N	2017	0.2	2	0.48	0.56	0.52	4	6.10	13.07	8.98	0	1
BBC_LB2N	2018	0.2	1	0.41	0.41	0.41	4	3.82	7.27	5.32	2	0
BBC_LB2N	2019	0.2	1	0.74	0.74	0.74	4	3.94	10.26	7.12	2	1

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_LB2N	07/13/15	07/27/15	2	1.4	1.4	1.4
BBC_LB2N	07/18/16	08/15/16	3	1.2	1.4	1.3
BBC_LB2N	07/06/17	07/06/17	1	1.6	1.6	1.6
BBC_LB2N	07/25/19	08/15/19	3	1.3	1.7	1.6
BBC_LB2X	05/29/15	09/23/15	14	0.9	1.8	1.3
BBC_LB2X	06/16/16	09/13/16	8	1.3	1.7	1.5
BBC_LB2X	06/06/17	09/16/17	10	1.2	2.1	1.6
BBC_LB2X	06/11/18	09/19/18	8	1.2	1.9	1.5
BBC_LB2X	06/14/19	09/09/19	10	1.4	1.8	1.6

Toxics and other pollutants (metals, ammonia, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_LB2N	07/13/15	08/25/15	0.2	4	0.012	0.019	0.016
BBC_LB2N	07/18/16	08/15/16	0.2	3	0.005	0.028	0.014
BBC_LB2N	07/06/17	08/17/17	0.2	4	0.004	0.008	0.006
BBC_LB2N	07/10/18	08/21/18	0.2	4	0.004	0.011	0.007
BBC_LB2N	07/11/19	08/15/19	0.2	4	0.004	0.025	0.010

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Little Buttermilk Bay (MA95-76); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Insufficient Information	YES
2022 Use Attainment Summary	

Little Buttermilk Bay (MA95-76): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1519 sq mi (92%). The approved shellfish growing area represents 0.141 sq mi (85%). The prohibited shellfish growing area represents 0.0109 sq mi (7%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi.

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB44.0	Buttermilk Bay	Approved	0.14098	85.5%
BB44.12	Southeast shoreline of Little Buttermilk Bay	Prohibited	0.01092	6.6%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Little Buttermilk Bay (MA95-76) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Little Buttermilk Bay (MA95-76) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Little Buttermilk Bay (MA95-76): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1519 sq mi (92%). The approved shellfish growing area represents 0.141 sq mi (85%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Little Buttermilk Bay (MA95-76) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary

Little Buttermilk Bay (MA95-76): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1519 sq mi (92%). The approved shellfish growing area represents 0.141 sq mi (85%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Little Long Pond (MA95088)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	47 ACRES
Classification/Qualifier:	B

No usable data were available for Little Long Pond (MA95088) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Little Long Pond (MA95089)

Location:	Wareham/Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	12 ACRES
Classification/Qualifier:	B

No usable data were available for Little Long Pond (MA95089) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Little River (MA95-66)

Location:	Dartmouth.
AU Type:	ESTUARY
AU Size:	0.18 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	2	None		Unchanged

Recommendations

2022 Recommendations

ALU: Benthic macroinvertebrate sampling of the Little River should be conducted and compared to former MEP project evaluations to evaluate if any changes have occurred as well as to evaluate any nutrient related stress in this tidal salt marsh creek. Water quality sampling should also be continued (total nitrogen sampling should

Designated Use Attainment Decisions

include at least three samples per summer season).

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in the Little River, Dartmouth (MA95-66) in the summers of 2015 through 2019, from upstream to downstream as follows: close to shore in the “inner” section of the AU (BBC_SR2), in the middle of the “inner” section of the AU (BBC_SR2B), and in the outer section of the AU at Little River Rd (BBC_SR). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at BBC_SR3 (~0.4m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 28°C (n=149). The minimum dissolved oxygen (DO) (measured only at BBC_SR3) was 3.5mg/L (n=112); <6.0mg/L frequently (29-81%) and <5.0mg/L at depth each year (19 to 60% of measurements). These results are consistent with the findings of other salt marsh dominated tidal creeks. Total nitrogen sampling (n=29, maximum 1.39mg/L at BBC_SR2B in 2019) during ebb tides in July and August documented seasonal average total nitrogen concentrations for sites/year with n>2 samples of 0.51mg/L at BBC_SR3 in 2018 and 0.54 and 0.74mg/L (at BBC_SR2B in 2017 and 2018, respectively.) The maximum chlorophyll <i>a</i> was 37.4µg/L (n=54); >5µg/L 38 times and >10µg/L 20 times (37% of the samples overall often three times a year close to shore in the “inner” section of the AU (at BBC_SR2)). The Secchi disk depth at BBC_SR2B in 2019 was 0.5m. Ammonia-nitrogen concentrations ranged from 0.004 to 0.09mg/L (n=54), though TUs for ammonia-nitrogen could not be calculated (lack of quality assured pH and salinity data).</p> <p>The Aquatic Life Use for Little River (MA95-66) is assessed as Fully Supporting. Although BBC staff/volunteers data collected in summers 2015 through 2019 do indicate low DO as well as some elevated chlorophyll <i>a</i> and total nitrogen concentrations, these conditions result from the local naturally organically enriched conditions typical of tidal salt marsh creeks (Howes, et al. 2012) so no impairments are being identified at this time. Additional sampling including benthic surveys are being recommended.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_SR2	Buzzards Bay Coalition	Water Quality	Little River	Little River Inner, Dartmouth	41.540305	-70.973165
BBC_SR2B	Buzzards Bay Coalition	Water Quality	Little River	Little River Inner, Dartmouth	41.540981	-70.971464
BBC_SR3	Buzzards Bay Coalition	Water Quality	Little River	Little River Outer, Dartmouth	41.535502	-70.969263

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_SR3	09/15/15	09/15/15	0.2	1	7.5	7.5	0	0	0
BBC_SR3	05/28/15	09/23/15	0.4	21	4.0	6.3	29	19	0
BBC_SR3	07/05/16	07/05/16	0.2	1	6.0	6.0	0	0	0
BBC_SR3	05/31/16	09/23/16	0.4	21	4.0	5.3	81	24	0
BBC_SR3	05/31/17	09/19/17	0.3	23	4.0	5.3	65	39	0
BBC_SR3	05/30/18	09/15/18	0.2	13	4.0	5.4	54	31	0
BBC_SR3	06/04/18	09/18/18	0.3	10	3.5	4.7	80	60	10
BBC_SR3	05/31/19	09/27/19	0.4	22	3.5	5.8	45	23	5

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_SR2	07/13/15	08/25/15	0.2	4	4	27.0	24.5	0
BBC_SR2	07/05/16	08/15/16	0.2	4	4	27.5	24.8	0
BBC_SR2	07/06/17	08/17/17	0.1	4	4	23.0	21.8	0
BBC_SR2	07/10/18	08/21/18	0.1	4	4	28.0	24.8	0
BBC_SR2	07/11/19	08/15/19	0.2	4	4	24.4	22.4	0
BBC_SR2B	07/05/16	08/15/16	0.3	4	4	27.0	23.8	0
BBC_SR2B	07/06/17	08/17/17	0.2	4	4	27.0	25.1	0
BBC_SR2B	07/10/18	08/21/18	0.1	4	4	27.0	23.8	0
BBC_SR2B	07/11/19	07/25/19	0.2	2	2	26.0	24.5	0
BBC_SR3	07/13/15	09/15/15	0.2	5	5	27.0	23.1	0
BBC_SR3	05/28/15	09/23/15	0.4	21	18	27.0	23.0	0
BBC_SR3	07/05/16	08/15/16	0.2	5	5	27.0	24.3	0
BBC_SR3	05/31/16	09/23/16	0.3	20	16	25.5	21.7	0
BBC_SR3	07/06/17	08/17/17	0.2	4	4	23.0	22.0	0
BBC_SR3	05/31/17	09/19/17	0.3	22	19	22.0	19.5	0
BBC_SR3	05/30/18	09/15/18	0.2	17	16	26.0	22.7	0
BBC_SR3	06/04/18	09/18/18	0.3	10	9	26.0	22.7	0
BBC_SR3	07/11/19	08/15/19	0.2	4	4	24.1	22.4	0
BBC_SR3	05/31/19	09/27/19	0.4	22	19	25.0	20.4	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_SR2	2015	0.2	2	0.43	0.72	0.58	4	7.42	37.43	17.05	0	3
BBC_SR2	2016	0.2	1	0.72	0.72	0.72	4	6.89	20.85	13.56	0	2
BBC_SR2	2017	0.1	2	0.71	0.99	0.85	4	9.95	19.11	14.43	0	3
BBC_SR2	2018	0.1	2	0.62	0.85	0.73	4	4.61	19.10	12.15	1	3
BBC_SR2	2019	0.2	2	0.58	1.16	0.87	4	1.39	24.05	12.64	1	2
BBC_SR2B	2016	0.2	2	0.38	0.40	0.39	4	2.80	12.90	6.31	2	1
BBC_SR2B	2017	0.2	3	0.45	0.68	0.54	4	4.35	19.02	9.15	1	1
BBC_SR2B	2018	0.2	4	0.40	1.00	0.74	4	2.34	5.00	3.59	4	0
BBC_SR2B	2019	0.2	2	0.60	1.39	0.99	2	6.33	22.89	14.61	0	1
BBC_SR3	2015	0.2	1	0.65	0.65	0.65	4	4.01	19.95	9.17	1	1
BBC_SR3	2016	0.2	1	0.40	0.40	0.40	4	2.63	8.31	5.06	2	0
BBC_SR3	2017	0.2	2	0.67	1.17	0.92	4	5.44	22.03	11.38	0	2
BBC_SR3	2018	0.2	4	0.38	0.79	0.51	4	3.86	6.67	5.16	2	0
BBC_SR3	2019	0.2	1	1.01	1.01	1.01	4	2.08	13.26	6.67	2	1

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_SR2B	07/25/19	07/25/19	1	0.5	0.5	0.5

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_SR2	07/13/15	08/25/15	0.2	4	0.008	0.028	0.017
BBC_SR2	07/05/16	08/15/16	0.2	4	0.005	0.010	0.007
BBC_SR2	07/06/17	08/17/17	0.1	4	0.004	0.013	0.008
BBC_SR2	07/10/18	08/21/18	0.1	4	0.004	0.014	0.006
BBC_SR2	07/11/19	08/15/19	0.2	4	0.004	0.045	0.014
BBC_SR2B	07/05/16	08/15/16	0.3	4	0.007	0.015	0.010
BBC_SR2B	07/06/17	08/17/17	0.2	4	0.006	0.016	0.009
BBC_SR2B	07/10/18	08/21/18	0.2	4	0.006	0.068	0.031
BBC_SR2B	07/11/19	07/25/19	0.2	2	0.017	0.092	0.055
BBC_SR3	07/13/15	08/25/15	0.2	4	0.010	0.019	0.014
BBC_SR3	07/05/16	08/15/16	0.2	4	0.006	0.013	0.009

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_SR3	07/06/17	08/17/17	0.2	4	0.004	0.012	0.008
BBC_SR3	07/10/18	08/21/18	0.2	4	0.005	0.025	0.012
BBC_SR3	07/11/19	08/15/19	0.2	4	0.004	0.033	0.012

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Little River (MA95-66); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Insufficient Information	YES
2022 Use Attainment Summary	
Little River (MA95-66): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1702 sq mi (95%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.1702 sq mi (95%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB7.0	Dartmouth Center Coastal	Approved	0.00000	0.0%
BB9.0	Little River	Prohibited	0.17021	95.4%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Little River (MA95-66) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No recent <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Little River (MA95-66) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Little River (MA95-66): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1702 sq mi (95%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No recent <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Little River (MA95-66) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Little River (MA95-66): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1702 sq mi (95%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Little Rocky Pond (MA95091)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	10 ACRES
Classification/Qualifier:	B

No usable data were available for Little Rocky Pond (MA95091) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Little Sandy Pond (MA95092)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	29 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Recommendations

2022 Recommendations
ALU: Conduct an aquatic macrophyte survey of Little Sandy Pond, with particular emphasis on identifying all <i>Myriophyllum</i> and <i>Utricularia</i> spp. present in the pond (confirmation of any non-native species should be made by a qualified state agency/taxonomist).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
As was previously reported, MassDEP staff noted the presence of <i>Myriophyllum</i> sp. in Little Sandy Pond during a July 1995 synoptic survey. However, it is not at all clear that this is a non-native species, as the note also said "(or <i>Utricularia</i> sp.)". No recent data are available to assess the status of the Aquatic Life Use for Little Sandy Pond (MA95092) so it is Not Assessed. The Alert previously identified for <i>Myriophyllum</i> sp. is being carried forward and arecommendation is being made to conduct an aquatic macrophyte survey of the pond.	

Biological Monitoring Information

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995)

Summary Statement	Assessment Recommendation
As was previously reported, MassDEP staff noted the presence of <i>Myriophyllum</i> sp. in Little Sandy Pond during a July 1995 synoptic survey. However, it is not at all clear that this is a non-native species, as the note also said "(or <i>Utricularia</i> sp.)". An aquatic macrophyte survey should be conducted to determine the identity of all <i>Myriophyllum</i> and <i>Utricularia</i> species present in the pond and the prior Alert should be retained for the time being.	Conduct an aquatic macrophyte survey of Little Sandy Pond, with particular emphasis on identifying all <i>Myriophyllum</i> and <i>Utricularia</i> spp. present in the pond.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	

No fish toxics monitoring has been conducted in Little Sandy Pond (MA95092); therefore, the Fish Consumption Use is Not Assessed.

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Little Sandy Pond (MA95092) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for Little Sandy Pond (MA95092) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Little Sandy Pond (MA95092) so it is Not Assessed.	

Little Sippewisset Marsh (MA95-24)

Location:	From headwaters north of Sippewisset Road and east of Maker Lane, Falmouth to the mouth at Buzzards Bay southwest of end of Saconneset Road, Falmouth.
AU Type:	ESTUARY
AU Size:	0.02 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			

Recommendations

2022 Recommendations
ALU: Continue to conduct total nitrogen sampling (at least three times per season at mid-ebb tide) to better evaluate any nutrient related stress for this Little Sippewisset Marsh AU (MA95-24).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	
<p>The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at one location in Little Sippewisset Marsh, Falmouth (MA95-24) in the summers of 2015 to 2019, at the most seaward end of the AU (BBC_LSM1). Monitoring was conducted in the surface waters, as well as at average depths ranging from 0.3 to 0.4m for some of the survey years and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 26°C (n=98). The minimum dissolved oxygen was 2.0mg/L (n=90); <6.0mg/L 55 times (~61% of the measurements overall) and <5.0mg/L 44 times (~49% of the measurements overall). These low DO concentrations are considered to be natural conditions consistent with those of a shallow salt marsh tidal creek. Total nitrogen sampling (n=18, maximum 0.65mg/L) during ebb tides in July and August documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.40 and 0.53mg/L, with two of four >0.5mg/L. The Chlorophyll <i>a</i> maximum was 6.92µg/L (n=19) only twice >5µg/L. Ammonia-nitrogen concentrations were low (range 0.008 to 0.034mg/L, n=19), but TUs could not be calculated (lack of quality assured pH and salinity data).</p> <p>The Aquatic Life Use for Little Sippewisset Marsh (MA95-24) is assessed as Fully Supporting based on the generally good water quality conditions documented by BBC staff/volunteers in summers 2015 to 2019. The consistently low dissolved oxygen considered to result from natural conditions consistent with those of a shallow salt marsh tidal creek. An Alert is being identified due to the slightly elevated total nitrogen concentrations and recommendations will be made for additional monitoring to better evaluate nutrient related stress.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_LSM1	Buzzards Bay Coalition	Water Quality	Little Sipp Marsh	Little Sippewisset Marsh, Falmouth	41.57711	-70.640795

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_LSM1	06/17/15	09/03/15	0.2	3	3.0	5.2	67	33	33
BBC_LSM1	06/05/15	09/23/15	0.3	19	2.5	4.8	68	47	26
BBC_LSM1	08/09/16	09/24/16	0.1	3	3.0	3.3	100	100	67
BBC_LSM1	08/04/16	09/17/16	0.2	8	2.0	5.4	50	25	13
BBC_LSM1	06/12/17	09/12/17	0.1	3	3.5	3.7	100	100	67
BBC_LSM1	05/31/17	09/21/17	0.3	18	2.5	5.0	56	44	22
BBC_LSM1	07/08/19	08/01/19	0.1	2	4.5	6.0	50	50	0
BBC_LSM1	05/31/19	09/19/19	0.4	34	2.0	5.2	56	50	32

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_LSM1	06/17/15	09/03/15	0.2	7	7	24.0	21.0	0
BBC_LSM1	06/05/15	09/23/15	0.3	18	16	25.0	21.3	0
BBC_LSM1	07/05/16	09/24/16	0.2	14	11	26.0	22.8	0
BBC_LSM1	06/12/17	09/12/17	0.2	6	6	24.0	21.2	0
BBC_LSM1	05/31/17	09/21/17	0.3	19	17	24.0	20.5	0
BBC_LSM1	07/10/18	08/21/18	0.2	4	4	24.8	23.1	0
BBC_LSM1	07/08/19	08/15/19	0.1	6	6	26.0	23.0	0
BBC_LSM1	05/31/19	09/19/19	0.4	34	31	25.2	21.7	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_LSM1	2015	0.3	4	0.32	0.61	0.42	4	2.72	6.92	3.98	3	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_LSM1	2016	0.2	1	0.57	0.57	0.57	2	1.48	2.97	2.23	2	0
BBC_LSM1	2016	0.4	1	0.38	0.38	0.38	1	2.79	2.79	2.79	1	0
BBC_LSM1	2017	0.3	3	0.49	0.53	0.51	3	1.67	4.14	2.80	3	0
BBC_LSM1	2017	0.3	1	0.55	0.55	0.55	1	3.48	3.48	3.48	1	0
BBC_LSM1	2018	0.2	4	0.37	0.65	0.53	4	2.05	2.72	2.46	4	0
BBC_LSM1	2019	0.2	4	0.31	0.49	0.40	4	0.38	5.19	2.07	3	0

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_LSM1	07/13/15	08/25/15	0.3	4	0.014	0.024	0.020
BBC_LSM1	07/05/16	08/15/16	0.2	2	0.013	0.018	0.015
BBC_LSM1	08/01/16	08/01/16	0.4	1	0.026	0.026	0.026
BBC_LSM1	07/06/17	08/03/17	0.3	3	0.019	0.032	0.026
BBC_LSM1	08/17/17	08/17/17	0.3	1	0.034	0.034	0.034
BBC_LSM1	07/10/18	08/21/18	0.2	4	0.015	0.032	0.021
BBC_LSM1	07/11/19	08/15/19	0.2	4	0.008	0.029	0.016

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Little Sippewisset Marsh (MA95-24); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Little Sippewisset Marsh (MA95-24): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0163 sq mi (76%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0163 sq mi (76%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area >= 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB57.0	Little Sippewisset Marsh	Prohibited	0.01634	76.0%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Little Sippewisset Marsh (MA95-24) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Little Sippewisset Marsh (MA95-24) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Little Sippewisset Marsh (MA95-24): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0163 sq mi (76%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Little Sippewisset Marsh (MA95-24) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Little Sippewisset Marsh (MA95-24): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0163 sq mi (76%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Little West Pond (MA95093)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	25 ACRES
Classification/Qualifier:	B

No usable data were available for Little West Pond (MA95093) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Long Duck Pond (MA95095)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	22 ACRES
Classification/Qualifier:	B

No usable data were available for Long Duck Pond (MA95095) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Long Pond (MA95096)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	207 ACRES
Classification/Qualifier:	B

No usable data were available for Long Pond (MA95096) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Long Pond (MA95097)

Location:	Rochester.
AU Type:	FRESHWATER LAKE
AU Size:	32 ACRES
Classification/Qualifier:	B

No usable data were available for Long Pond (MA95097) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Mercury in Fish Tissue	33880	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Mercury in Fish Tissue	Atmospheric Deposition - Toxics (Y)		X			
Mercury in Fish Tissue	Source Unknown (N)		X			

Mare Pond (MA95172)

Location:	Plymouth (formerly reported as 1996 segment: Mare Pond MA94097).
AU Type:	FRESHWATER LAKE
AU Size:	13 ACRES
Classification/Qualifier:	B

No usable data were available for Mare Pond (MA95172) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Marys Pond (MA95100)

Location:	Rochester.
AU Type:	FRESHWATER LAKE
AU Size:	81 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	5	Mercury in Fish Tissue		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Mercury in Fish Tissue	Atmospheric Deposition (N)		X			

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aquatic Life Use for Marys Pond (MA95100) so it is Not Assessed.	

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP biologists conducted fish toxics sampling in Marys Pond in Rochester (DPH lists Rochester, Marion) in May 2018 as part of the probabilistic lake surveys (MAP2). Because of elevated mercury measured in fish fillets, MassDPH issued the following fish consumption advisories:</p> <ul style="list-style-type: none"> "Children younger than 12 years of age, pregnant women, women of childbearing age who may become pregnant, and nursing mothers should not eat any fish from this water body." "The general public should limit consumption of all fish from this water body to two meals per month." <p>Since there is a site-specific MA DPH advisory for elevated mercury in fish tissue, the Fish Consumption Use for Marys Pond (MA95100) is assessed as Not Supporting. A Mercury in Fish Tissue impairment is being added. The likely source, although not confirmed, is atmospheric deposition.</p>	

MassDEP fish toxics sampling information (2018-2020) and MassDPH Fish Consumption Advisory information (2019-2021) (MassDPH 2021, MassDEP 2018, MassDEP Undated11)

MassDEP biologists conducted fish toxics sampling at Marys Pond in Rochester (DPH lists Rochester, Marion) in May 2018 as part of the probabilistic lake surveys (MAP2). Because of elevated mercury measured in fish fillets, MassDPH issued the following fish consumption advisories:

- *"Children younger than 12 years of age, pregnant women, women of childbearing age who may become pregnant, and nursing mothers should not eat any fish from this water body."*
- *"The general public should limit consumption of all fish from this water body to two meals per month."*

Since there is a site specific DPH advisory for elevated mercury in fish tissue, the Fish Consumption Use for Marys Pond (MA95100) is assessed as Not Supporting. The likely source, although not confirmed, is atmospheric deposition.

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Marys Pond (MA95100) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for Marys Pond (MA95100) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Marys Pond (MA95100) so it is Not Assessed.	

Mattapoisett Harbor (MA95-35)

Location:	From the mouth of the Mattapoisett River, Mattapoisett to a line drawn from Ned Point to a point of land between Bayview Avenue and Grandview Avenue, Mattapoisett.
AU Type:	ESTUARY
AU Size:	1.12 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Dissolved Oxygen		Added
5	5	Estuarine Bioassessments		Unchanged
5	5	Fecal Coliform	36172	Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Source Unknown (N)	X					
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)	X					

Recommendations

2022 Recommendations
ALU: Conduct additional monitoring for nutrient enrichment indicators on summer ebb tides for the Mattapoisett Harbor AU (MA95-35). Be sure to get at least three samples per year for total nitrogen so seasonal averages can be calculated as per CALM requirements.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an ~74% loss of eelgrass bed habitat in Mattapoisett Harbor between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at five locations throughout Mattapoisett Harbor, Mattapoisett (MA95-35) in the summers of 2015-2019, from inner to outer as follows: From a dock on the North shore at BBC_MH1, off Shining Tides Reservation Beach at BBC_MH4X and then further out into the harbor at BBC_MH4N, MH5 and MH6. Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column (at depths ranging 1.2m at BBC_MH4X to 4.7m out at BBC_MH5) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 28.5°C (n=514), minimum dissolved oxygen (DO) was 2.0mg/L (n=502) and was <6.0mg/L 130 times (26% of the measurements overall) and <5.0mg/L 43 times (9.0% of the measurements overall) throughout the harbor. Excursions from the 6.0mg/L DO criterion occurred most frequently (11-48% of the measurements annually) at the inner harbor stations BBC_MH1 and MH4X, at a range of depths including surface waters. Further out into the harbor (at BBC_MH5) the most frequent excursions were restricted to deeper in the water column (always >10% annually). Severe excursions from the 6.0mg/L criterion (i.e., <5.0mg/L) also frequently occurred throughout the water column at BBC_MH1, fewer times at BBC_MH4X, and were also restricted to deeper in the water column at BBC_MH5. Nutrient sampling efforts (ebb tides in June September n=55, maximum 0.61mg/L at BBC_MH4N in 2019) documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.28-0.40mg/L. The maximum chlorophyll *a* concentration of 15.97µg/L was documented at BBC_MH1 in 2015 (n=94), was >5µg/L 24 times, but >10µg/L on only two occasions throughout the harbor. Secchi disk depth measurements were taken weekly at BBC_MH1 and MH5 (though more sporadically at the other locations) in the summers of 2015-2019. Yearly average Secchi disk depths ranged from 0.6 to 2.4m throughout the harbor (n=226). Ammonia-nitrogen concentrations were generally low, (range 0.004 to 0.04mg/L (n=94)) but TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for Mattapoisett Harbor (MA95-35) will continue to be assessed as Not Supporting based on the loss of eelgrass bed habitat documented by the MassDEP between 1995 and 2017 and the water quality data collected by the BBC staff/volunteers in 2015-2019. The Estuarine Bioassessments and Nutrient/Eutrophication Biological Indicators impairments are being carried forward. A new impairment for Dissolved Oxygen is being added due to the low concentrations documented by the BBC, particularly in the inner harbor, in agreement with the BBC comments made on the 2018/20 IR. BBC also requested an impairment for Total Nitrogen be added due to “incidences of high total nitrogen concentrations with a long-term average (1992-2020) in the inner harbor ranging from 0.37-0.56mg/L”. Data from BBC stations MH1, MH4N, and MH5 were incorporated into their comment and were evaluated for this AU, however it is noted here that the highest total nitrogen concentrations occurred further upstream (BBC_MH3 in the upstream Mattapoisett River AU MA95-60). Since seasonal average total nitrogen data collected in Mattapoisett Harbor (MA95-35) 2015-2019 did not exceed 0.4mg/L (the MEP critical indicator threshold for eelgrass habitat), an impairment for Total Nitrogen is not being added at this time.

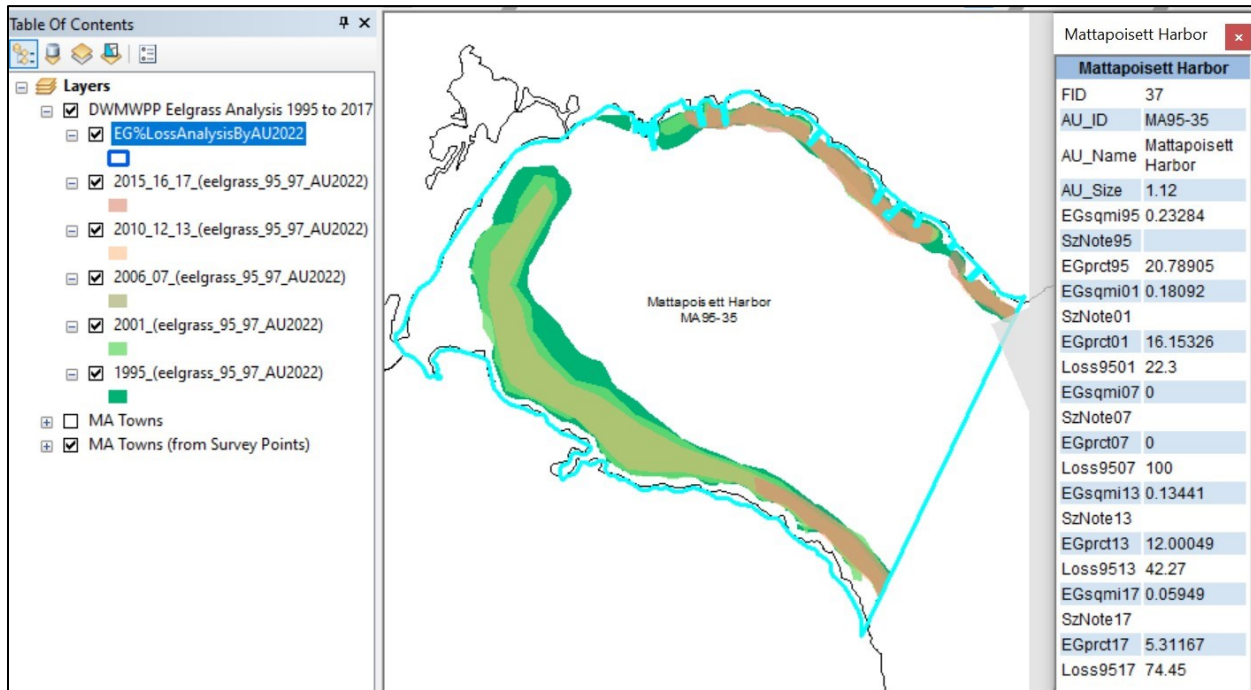
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_MH1	Buzzards Bay Coalition	Water Quality	Mattapoisett Harbor	Mattapoisett Harbor Inner, Mattapoisett	41.656167	-70.81302
BBC_MH4N	Buzzards Bay Coalition	Water Quality	Mattapoisett Harbor	Mattapoisett Harbor Inner, Mattapoisett has been	41.651078	-70.82095
BBC_MH4X	Buzzards Bay Coalition	Water Quality	Mattapoisett Harbor	Mattapoisett Harbor Inner, Mattapoisett	41.652087	-70.822839
BBC_MH5	Buzzards Bay Coalition	Water Quality	Mattapoisett Harbor	Mattapoisett Harbor Outer, Mattapoisett	41.649811	-70.810461
BBC_MH6	Buzzards Bay Coalition	Water Quality	Mattapoisett Harbor	Mattapoisett Harbor Outer, Mattapoisett	41.64695	-70.80185

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Mattapoisett Harbor MA95-35 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~74% loss of eelgrass bed habitat in Mattapoisett Harbor between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_MH1	05/29/15	09/24/15	0.2	20	4.0	6.2	25	5	0
BBC_MH1	05/29/15	09/24/15	2.2	21	3.0	5.7	48	29	5
BBC_MH1	01/06/16	09/26/16	0.2	23	3.5	6.2	48	26	9
BBC_MH1	01/06/16	09/26/16	2.0	23	2.0	5.9	43	26	9
BBC_MH1	01/09/17	09/19/17	0.2	31	4.5	7.0	26	3	0
BBC_MH1	03/08/17	09/19/17	1.9	29	3.9	6.8	17	10	3
BBC_MH1	06/06/18	09/20/18	0.2	19	4.6	6.4	32	5	0
BBC_MH1	06/06/18	09/20/18	1.9	19	3.9	6.4	26	11	5
BBC_MH1	05/30/19	09/23/19	0.2	19	5.0	6.9	11	0	0
BBC_MH1	05/30/19	09/23/19	2.4	19	4.5	6.8	11	5	0
BBC_MH4X	06/11/15	09/14/15	0.2	17	4.0	7.2	18	6	0
BBC_MH4X	06/16/15	09/14/15	1.2	9	5.0	7.3	11	0	0
BBC_MH4X	05/31/16	09/24/16	0.2	22	2.5	6.3	36	14	5
BBC_MH4X	06/05/16	09/18/16	1.2	9	5.0	6.7	22	0	0
BBC_MH4X	05/31/17	09/20/17	0.2	18	5.0	6.0	39	0	0
BBC_MH4X	06/21/17	09/20/17	1.4	5	5.0	6.2	20	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_MH4X	05/30/18	09/19/18	0.2	20	4.5	6.2	30	5	0
BBC_MH4X	05/30/18	08/27/18	1.2	5	4.0	6.2	40	20	0
BBC_MH4X	05/30/19	09/23/19	0.2	20	4.5	7.0	15	5	0
BBC_MH4X	06/04/19	08/14/19	1.3	6	6.5	7.7	0	0	0
BBC_MH5	06/03/15	09/23/15	0.2	18	6.2	7.0	0	0	0
BBC_MH5	06/03/15	09/23/15	4.7	18	4.0	6.2	33	11	0
BBC_MH5	06/05/16	09/23/16	0.2	15	5.6	6.8	7	0	0
BBC_MH5	06/05/16	09/23/16	4.8	15	4.9	6.2	27	7	0
BBC_MH5	06/07/17	09/17/17	0.2	18	6.2	7.2	0	0	0
BBC_MH5	06/07/17	09/17/17	4.2	18	4.3	6.2	39	17	0
BBC_MH5	05/31/18	09/19/18	0.2	17	5.2	7.0	6	0	0
BBC_MH5	05/31/18	09/19/18	4.3	17	4.5	6.1	53	6	0
BBC_MH5	06/26/19	09/15/19	0.4	6	6.1	7.0	0	0	0
BBC_MH5	06/26/19	09/15/19	3.3	6	4.1	6.1	33	17	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_MH1	05/29/15	09/24/15	0.2	28	24	24.0	21.5	0
BBC_MH1	05/29/15	09/24/15	2.2	20	17	24.0	21.5	0
BBC_MH1	01/06/16	09/26/16	0.2	28	21	27.0	21.7	0
BBC_MH1	01/06/16	09/26/16	2.1	23	16	25.2	21.3	0
BBC_MH1	01/09/17	09/19/17	0.2	33	27	25.4	21.4	0
BBC_MH1	03/08/17	09/19/17	1.9	28	23	24.8	21.1	0
BBC_MH1	06/06/18	09/20/18	0.2	23	22	26.0	23.0	0
BBC_MH1	06/06/18	09/20/18	1.9	19	18	26.6	23.0	0
BBC_MH1	05/30/19	09/23/19	0.2	22	19	25.2	21.8	0
BBC_MH1	05/30/19	09/23/19	2.4	19	16	25.1	21.5	0
BBC_MH4N	07/13/15	08/25/15	0.2	4	4	24.0	22.8	0
BBC_MH4N	07/13/15	08/25/15	3.0	4	4	24.0	22.5	0
BBC_MH4N	07/05/16	08/15/16	0.2	4	4	28.0	24.8	0
BBC_MH4N	07/05/16	07/18/16	2.9	2	2	22.0	21.5	0
BBC_MH4N	07/06/17	08/17/17	0.2	2	2	24.0	23.5	0
BBC_MH4N	07/10/18	08/21/18	0.2	4	4	24.0	23.6	0
BBC_MH4N	07/11/19	08/15/19	0.2	4	4	24.0	23.4	0
BBC_MH4X	06/11/15	09/14/15	0.2	17	17	26.0	23.9	0
BBC_MH4X	06/16/15	09/14/15	1.2	8	8	25.5	23.3	0
BBC_MH4X	05/31/16	09/24/16	0.2	22	18	28.5	24.4	0
BBC_MH4X	06/05/16	09/18/16	1.1	9	8	28.5	24.6	0
BBC_MH4X	05/31/17	09/20/17	0.2	18	16	24.5	22.2	0
BBC_MH4X	06/21/17	09/20/17	1.3	5	4	25.0	22.5	0
BBC_MH4X	05/30/18	09/19/18	0.2	20	17	26.0	22.5	0
BBC_MH4X	05/30/18	08/27/18	1.2	5	4	25.0	21.5	0
BBC_MH4X	05/30/19	09/23/19	0.2	20	17	26.0	23.0	0
BBC_MH4X	06/04/19	08/14/19	1.3	6	6	25.0	21.5	0
BBC_MH5	06/03/15	09/23/15	0.2	22	20	26.4	23.1	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_MH5	06/03/15	09/23/15	4.7	18	16	25.8	22.7	0
BBC_MH5	06/05/16	09/23/16	0.2	22	19	27.0	23.4	0
BBC_MH5	06/05/16	09/23/16	4.7	18	15	26.5	23.0	0
BBC_MH5	06/07/17	09/17/17	0.2	20	19	25.0	21.7	0
BBC_MH5	06/07/17	09/17/17	4.1	18	17	23.4	21.1	0
BBC_MH5	05/31/18	09/19/18	0.2	21	18	26.6	23.3	0
BBC_MH5	05/31/18	09/19/18	4.4	17	14	26.3	22.8	0
BBC_MH5	06/26/19	09/15/19	0.3	10	10	25.2	22.7	0
BBC_MH5	06/26/19	09/15/19	3.3	6	6	24.6	21.8	0
BBC_MH6	07/13/15	08/25/15	0.2	4	4	24.0	22.8	0
BBC_MH6	07/05/16	08/15/16	0.2	4	4	27.0	24.3	0
BBC_MH6	07/06/17	08/17/17	0.2	2	2	23.5	22.8	0
BBC_MH6	07/10/18	08/21/18	0.2	4	4	24.7	23.8	0
BBC_MH6	07/11/19	08/15/19	0.2	4	4	24.0	23.4	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_MH1	2015	0.2	8	0.27	0.41	0.32	8	2.26	15.97	6.34	4	1
BBC_MH1	2016	0.2	6	0.27	0.37	0.34	9	0.67	7.66	2.94	8	0
BBC_MH1	2017	0.2	6	0.25	0.49	0.36	10	1.35	5.04	3.18	10	0
BBC_MH1	2018	0.2	3	0.32	0.35	0.34	4	2.59	4.46	3.65	4	0
BBC_MH1	2019	0.2	1	0.37	0.37	0.37	3	3.50	7.46	5.55	1	0
BBC_MH4N	2015	0.2	3	0.27	0.34	0.31	4	4.16	6.51	5.35	2	0
BBC_MH4N	2015	3.0	4	0.25	0.37	0.31	4	5.54	10.59	8.39	0	1
BBC_MH4N	2016	0.2	3	0.37	0.45	0.40	4	2.40	4.30	3.35	4	0
BBC_MH4N	2016	2.9	2	0.33	0.36	0.34	2	3.63	4.60	4.12	2	0
BBC_MH4N	2017	0.2	2	0.40	0.45	0.42	2	3.04	3.44	3.24	2	0
BBC_MH4N	2018	0.2	2	0.34	0.35	0.34	4	1.89	4.09	2.64	4	0
BBC_MH4N	2019	0.2	1	0.61	0.61	0.61	4	3.00	5.77	4.35	2	0
BBC_MH5	2015	0.2	3	0.25	0.32	0.28	4	4.67	9.88	6.73	1	0
BBC_MH5	2016	0.2	3	0.29	0.36	0.32	4	2.41	3.81	3.10	4	0
BBC_MH5	2017	0.2	--	--	--	--	2	3.76	5.36	4.56	1	0
BBC_MH5	2018	0.2	--	--	--	--	4	3.12	4.52	3.64	4	0
BBC_MH5	2019	0.2	2	0.47	0.59	0.53	4	3.63	6.60	4.69	3	0
BBC_MH6	2015	0.2	3	0.26	0.30	0.28	4	2.69	8.67	4.94	3	0
BBC_MH6	2016	0.2	1	0.27	0.27	0.27	4	1.77	7.72	4.12	3	0
BBC_MH6	2017	0.2	--	--	--	--	2	3.19	4.29	3.74	2	0
BBC_MH6	2018	0.2	1	0.26	0.26	0.26	4	2.93	3.89	3.43	4	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_MH6	2019	0.2	1	0.36	0.36	0.36	4	3.38	6.80	5.35	2	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_MH1	06/03/15	09/15/15	15	1.2	2.5	1.9
BBC_MH1	06/06/16	09/26/16	18	1.2	2.1	1.8
BBC_MH1	05/31/17	09/19/17	26	0.7	2.0	1.5
BBC_MH1	06/06/18	09/20/18	21	1.2	2.0	1.6
BBC_MH1	05/30/19	09/23/19	22	0.8	2.5	1.5
BBC_MH4N	07/13/15	08/25/15	4	1.4	2.0	1.7
BBC_MH4N	07/05/16	08/01/16	3	0.7	1.6	1.3
BBC_MH4N	07/06/17	07/06/17	1	0.6	0.6	0.6
BBC_MH4N	07/25/19	08/15/19	2	1.1	1.3	1.2
BBC_MH4X	06/16/15	06/16/15	1	1.0	1.0	1.0
BBC_MH4X	07/05/16	07/05/16	1	1.6	1.6	1.6
BBC_MH4X	06/27/18	06/27/18	1	1.4	1.4	1.4
BBC_MH4X	06/04/19	08/14/19	3	1.2	1.5	1.3
BBC_MH5	06/03/15	09/20/15	21	1.2	3.8	2.3
BBC_MH5	06/05/16	09/23/16	22	1.4	3.2	2.1
BBC_MH5	06/07/17	09/17/17	19	0.9	3.6	2.0
BBC_MH5	05/31/18	09/19/18	20	1.4	2.6	2.0
BBC_MH5	06/26/19	09/15/19	9	1.0	2.3	1.7
BBC_MH6	07/13/15	08/25/15	4	1.7	3.2	2.3
BBC_MH6	07/05/16	08/15/16	4	1.7	3.4	2.4
BBC_MH6	07/06/17	07/06/17	1	0.9	0.9	0.9
BBC_MH6	07/10/18	08/21/18	4	1.8	2.5	2.0
BBC_MH6	07/11/19	08/15/19	4	1.2	2.6	1.7

Public comment submitted by Buzzards Bay Coalition as part of the 2018/20 IR

E. Mattapoisett Harbor Fails to Meet State Water Quality Standards and Must be Listed as Impaired for Total Nitrogen on the 2018/2020 List of Category 5 Waters.

The Coalition supports the addition of Mattapoisett Harbor, in the town of Mattapoisett to the Commonwealth of Massachusetts' 303(d) list of Category 5 waters as impaired for estuarine bioassessments and nutrient/eutrophication biological indicators requiring a TMDL. The

Coalition requests that, in addition, Mattapoisset Harbor be listed as impaired for total nitrogen. The Coalition's water quality monitoring data support its listing.

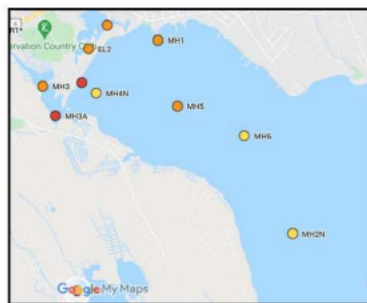
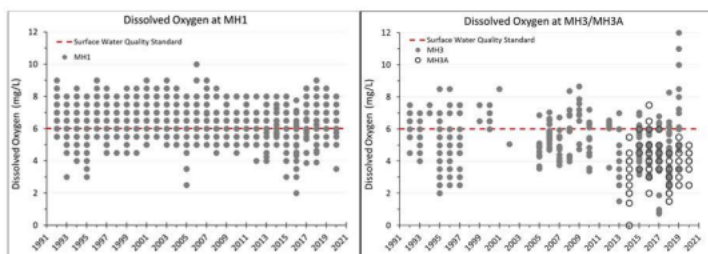


Figure 17. Mattapoisset Harbor Site Map

Mattapoisset Harbor demonstrates water quality decline related to excess nutrients. As described above, excessive levels of nitrogen are common in southeastern Massachusetts and result in ecosystem degradation with impacts including loss of eelgrass beds, algae blooms, fish kills and reductions in important marine life. In order to target areas that are suffering from excessive levels nitrogen, like Mattapoisset Harbor, and remove as much nitrogen as possible from these areas, it is imperative that MassDEP list Fiddlers Cove as impaired for total nitrogen, requiring a TMDL for nitrogen.

4. Mattapoisset Harbor Dissolved Oxygen

The Coalition submits multiple years of oxygen data taken from sites MH1, MH3, MH3A, MH4X, and MH5 depicting water quality impairment due to nutrient over-enrichment. The Coalition's dissolved oxygen data show that Mattapoisset Harbor consistently falls below the numeric criteria of 6 mg/L as designated in 314 CMR 4.05(4)(a)(1)(a) and warrants listing on the 303(d) list.



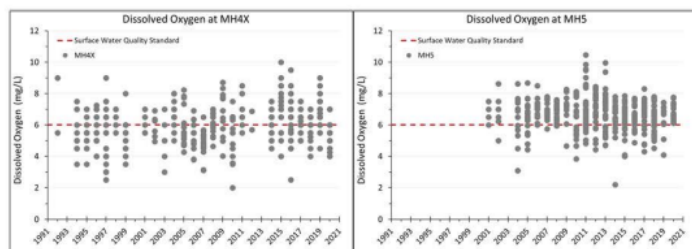
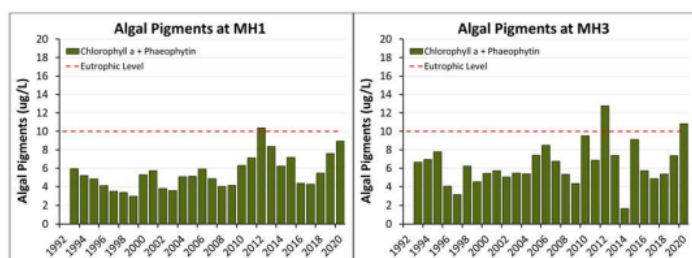


Figure 18. Dissolved Oxygen Concentrations in Mattapoisset Harbor

The dissolved oxygen concentrations in Figure 18 clearly show many samples below the numeric dissolved oxygen criteria established in the Massachusetts Surface Water Quality Standards.

5. Mattapoisset Harbor Chlorophyll Data

The Coalition's chlorophyll data show periodic high chlorophyll values, indicating that Mattapoisset Harbor does not possess the excellent aesthetic values required of SA waters pursuant to 314 CMR 4.05(4)(a), "These waters shall have excellent aesthetic value" and warrants listing on the 303(d) list.



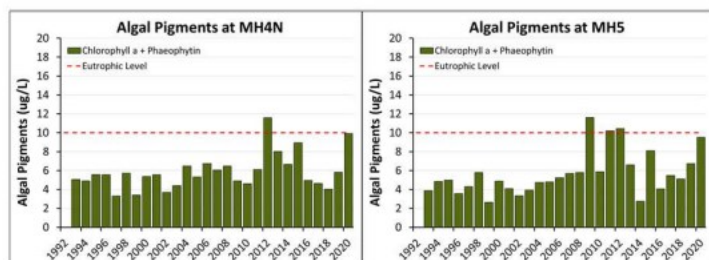


Figure 19. Phytoplankton Pigments in Fiddlers Cove

The phytoplankton pigment data presented in Figure 19 show annual average chlorophyll concentrations that periodically exceed 10 mg/L. The concentrations also appear to be trending higher over time. High concentrations of chlorophyll indicate degraded water clarity in violation of the excellent aesthetic value required in Massachusetts Surface Water Quality Standards.

6. Mattapoisett Harbor Total Nitrogen Data

The Coalition's total nitrogen data for Mattapoisett Harbor (Figure 20) exhibits total nitrogen concentrations that are highest in the inner part of the harbor near the mouth of the Mattapoisett River. The long-term average total nitrogen in inner Mattapoisett Harbor ranges from 0.37 mg/L to 0.56 mg/L, values that are higher than those typically set for TMDLs. Excess nitrogen levels will cause low dissolved oxygen numbers and promote algae growth, results that are illustrated above. The incidences of high total nitrogen concentration and low dissolved oxygen indicate that Mattapoisett Harbor fails to attain state water quality standards and must also be listed on the 303(d) list as impaired for total nitrogen.

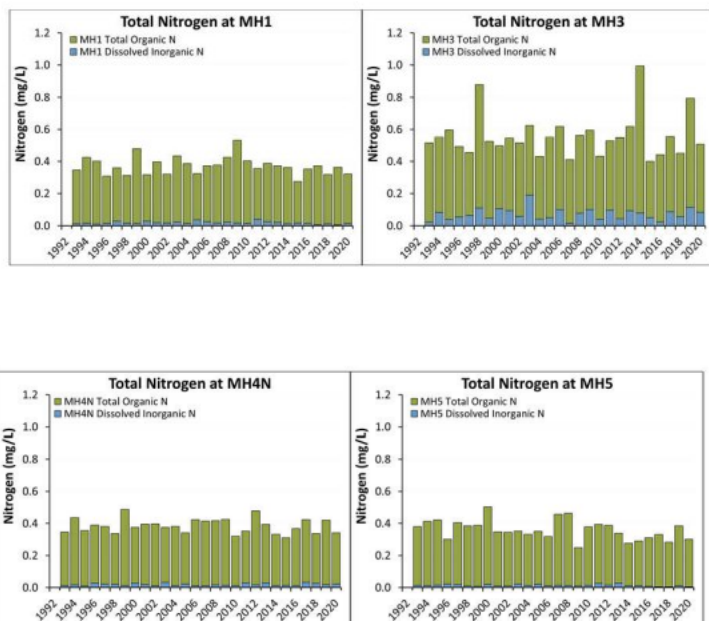


Figure 20. Total Nitrogen in Mattapoisett Harbor

In summary, the dissolved oxygen data are in clear violation of surface water quality standards, falling below dissolved oxygen levels of 6 mg/L. Periodically elevated chlorophyll levels that degrade water clarity and aesthetic value, as well as relatively high total nitrogen concentrations are also evident. **The data above show that Mattapoisett Harbor is suffering from eutrophication due to excess nutrients and must be listed on the Commonwealth of Massachusetts' 303(d) list of Category 5 waters requiring a TMDL for total nitrogen in addition to the impairments for nutrient/eutrophication biological indicators and estuarine bioassessments.**

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_MH1	06/16/15	09/24/15	0.2	8	0.007	0.036	0.015
BBC_MH1	01/06/16	09/26/16	0.2	9	0.004	0.025	0.011
BBC_MH1	01/09/17	09/19/17	0.2	10	0.004	0.028	0.013
BBC_MH1	07/10/18	08/21/18	0.2	4	0.004	0.005	0.004
BBC_MH1	07/25/19	08/15/19	0.2	3	0.004	0.007	0.005
BBC_MH4N	07/13/15	08/25/15	0.2	4	0.007	0.015	0.011
BBC_MH4N	07/13/15	08/25/15	3.0	4	0.009	0.016	0.013
BBC_MH4N	07/05/16	08/15/16	0.2	4	0.004	0.020	0.012
BBC_MH4N	07/05/16	07/18/16	2.9	2	0.005	0.007	0.006
BBC_MH4N	07/06/17	08/17/17	0.2	2	0.016	0.024	0.020
BBC_MH4N	07/10/18	08/21/18	0.2	4	0.004	0.040	0.018
BBC_MH4N	07/11/19	08/15/19	0.2	4	0.004	0.028	0.015
BBC_MH5	07/13/15	08/25/15	0.2	4	0.006	0.011	0.008
BBC_MH5	07/05/16	08/15/16	0.2	4	0.004	0.007	0.006
BBC_MH5	07/06/17	08/17/17	0.2	2	0.004	0.004	0.004
BBC_MH5	07/10/18	08/21/18	0.2	4	0.004	0.004	0.004
BBC_MH5	07/11/19	08/15/19	0.2	4	0.004	0.019	0.008
BBC_MH6	07/13/15	08/25/15	0.2	4	0.006	0.012	0.009
BBC_MH6	07/05/16	08/15/16	0.2	4	0.006	0.007	0.006
BBC_MH6	07/06/17	08/17/17	0.2	2	0.004	0.004	0.004
BBC_MH6	07/10/18	08/21/18	0.2	4	0.004	0.005	0.004
BBC_MH6	07/11/19	08/15/19	0.2	4	0.004	0.004	0.004

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Mattapoisett Harbor (MA95-35); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Mattapoisett Harbor (MA95-35): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.1014 sq mi (98%). The approved shellfish growing area represents 0.296 sq mi (26%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB25.0	Mattapoisett Harbor	Approved	0.29599	26.5%
BB25.10	Cove East of the Town Landing	Conditionally Approved	0.00574	0.5%
BB25.11	Town Docks	Prohibited	0.09853	8.8%
BB25.12	Shining Tides	Conditionally Approved	0.03463	3.1%
BB25.2	Mattapoisett Inner Harbor	Conditionally Approved	0.66339	59.3%
BB25.7	Mattapoisett Boatyard	Prohibited	0.00303	0.3%
BB27.0	Eel Pond	Prohibited	0.00004	0.0%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
<p>BBC comments made on the 2018/20 IR state “periodically elevated chlorophyll <i>a</i> levels that degrade water quality and aesthetic value”, and that chlorophyll data appeared to be trending higher over time, in Mattapoisett Harbor. It is the visual presence of planktonic blooms/mats/scums that are used to evaluate aesthetically objectionable conditions (CALM guidance) and BBC documented chlorophyll <i>a</i> concentrations >10µg/L on just two occasions throughout the harbor between 2015 and 2019 so a chlorophyll <i>a</i> impairment will not be identified at this time.</p> <p>Insufficient data are available to evaluate the Aesthetic Use for Mattapoisett Harbor (MA95-35), so it is Not Assessed.</p>	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There are four beaches in the Mattapoisett Harbor AU (MA95-35), in the town of Mattapoisett. The names and ID codes for the beaches are as follows: On the north-east shore, Neds Point (ID 2979) & Mattapoisett Town Beach (ID 2987); at the west/top end, Shining Tides Reservation (ID 2988), and on the south-west shore, Mattapoisett Shores Association (ID 2978). All the beaches were either never or infrequently posted for swimming between 2014 and 2019, except for Shining Tides Reservation in 2015 when the beach was posted for 10% of the bathing season. MassDEP staff conducted BST work on an unnamed tributary to the Mattapoisett Town Beach between 2011 and 2013. The tributary discharges to the beach via a culvert that daylight downstream of Water Street. A maximum <i>E.coli</i> concentration of 521MPN was documented in the tributary downstream of Water Street (i.e., on the beach) in 2012. Sampling efforts extended up and into the drainage infrastructure of Church Street & Captains Lane, with assistance from the Town of Mattapoisett. Human Marker analysis for the tributary indicated “inconclusive” evidence of a human source and no correctable source was ever found.</p> <p>The Primary Contact Recreational Use for Mattapoisett Harbor (MA95-35) is assessed as Fully Supporting since there were few, if any, swimming advisory postings at the Neds Point, Mattapoisett Town, Shining Tides Reservation, and Mattapoisett Shores Association beaches. The prior Alert due to >11% of the bathing season being posted at Neds Point in 2013 is being removed, since there were no postings at this beach between 2014 and 2019.</p>	

Bacteria Data

MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019 (MassDEP Undated2)

Summary

Prior to 2011 BST work began in one specific unnamed tributary to the Mattapoisett Harbor AU (MA95-35), as the result of a request by CZM. There were concerns regarding regular beach closures at the "Town Beach" due to elevated bacteria and this tributary directly discharges to the beach via a culvert that daylight downstream of Water Street. Additional BST work was conducted on this tributary between 2011 and 2013, with a max E.coli concentration of 521MPN observed downstream of Water Street (on the beach) in 2012. Samples were taken up as far as Church Street and extended into the drainage infrastructure of Church Street and Captains Lane with assistance from the Town of Mattapoisett. Human Marker analysis run for the tributary indicated "inconclusive" evidence of a human source and no correctable source was ever found.

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2978	Mattapoisett Shores Association/Mattapoisett	41.63917	-70.80310	41.63686	-70.80240	0%	0%	0%	0%	0%	0%	0
2979	Ned's Point/Mattapoisett	41.65118	-70.79630	41.65129	-70.79430	0%	0%	0%	0%	0%	0%	0
2987	Mattapoisett Town Beach/Mattapoisett	41.65780	-70.80970	41.65826	-70.80800	0%	4%	0%	0%	0%	0%	0
2988	Shining Tides Reservation/Mattapoisett	41.64931	-70.82520	41.65454	-70.82210	0%	10%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary

Mattapoisett Harbor (MA95-35): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.1014 sq mi (98%). The approved shellfish growing area represents 0.296 sq mi (26%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	

There are four beaches in the Mattapoisett Harbor AU (MA95-35), in the town of Mattapoisett. The names and ID codes for the beaches are as follows: On the north-east shore, Neds Point (ID 2979) & Mattapoisett Town Beach (ID 2987); at the west/top end, Shining Tides Reservation (ID 2988), and on the south-west shore, Mattapoisett Shores Association (ID 2978). All the beaches were either never or infrequently posted for swimming between 2014 and 2019, except for Shining Tides Reservation in 2015, when the beach was posted for 10% of the bathing season. MassDEP staff conducted BST work on an unnamed tributary to the Mattapoisett Town Beach between 2011 and 2013. The tributary discharges to the beach via a culvert that daylights downstream of Water Street. A maximum E.coli concentration of 521MPN was documented in the tributary downstream of Water Street (i.e., on the beach) in 2012. Sampling efforts extended up and into the drainage infrastructure of Church Street & Captains Lane, with assistance from the Town of Mattapoisett. Human Marker analysis for the tributary indicated “inconclusive” evidence of a human source and no correctable source was ever found.

The Secondary Contact Recreational Use for Mattapoisett Harbor (MA95-35) is assessed as Fully Supporting since there were few, if any, swimming advisory postings at the Neds Point, Mattapoisett Town, Shining Tides Reservation, and Mattapoisett Shores Association beaches between 2014 and 2019.

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary

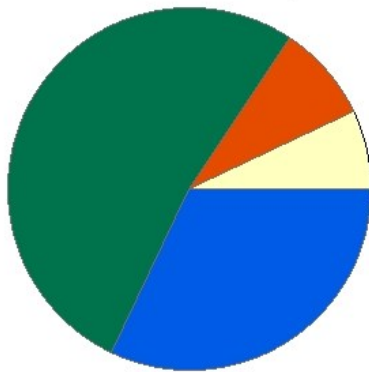
<p>Mattapoisett Harbor (MA95-35): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.1014 sq mi (98%). The approved shellfish growing area represents 0.296 sq mi (26%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.</p>

Mattapoissett River (MA95-36)

Location:	Headwaters, outlet Snipatuit Pond, Rochester to Mattapoissett River Dam (#MA02447) at Fairhaven Road (Route 6), Mattapoissett.
AU Type:	RIVER
AU Size:	10.4 MILES
Classification/Qualifier:	B

Mattapoissett River - MA95-36

Watershed Area: 24.17 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	24.17	7.55	6.14	1.79
Agriculture	7.1%	4.6%	10.5%	8.6%
Developed	8.6%	9%	6.4%	6.8%
Natural	52.3%	50.6%	40.6%	37.6%
Wetland	32.1%	35.8%	42.5%	46.9%
Impervious Cover	3.3%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Benthic Macroinvertebrates		Added
5	5	Enterococcus		Unchanged
5	5	Escherichia Coli (E. Coli)		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Benthic Macroinvertebrates	Source Unknown (N)	X				
Enterococcus	Source Unknown (N)				X	
Escherichia Coli (E. Coli)	Source Unknown (N)				X	

Recommendations

2022 Recommendations
<p>PRIM: High frequency E. coli bacteria sampling in this Mattapoisett River AU (MA95-36) is needed at three of the four WPP sampling sites (W2397, W1383, W2388, and/or W1384) to evaluate status of Primary Contact Recreational Use as well as to provide data to reevaluate appropriateness of potential E. coli delisting (deferred in 2022 IR reporting cycle). Enterococci sampling at these sites as well as in the river at 201 Snipatuit Rd in Rochester (UMassD_2) is also being recommended since Enterococcus is also listed as an impairment.</p>

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
<p>MA DFG and MassDEP biologists conducted backpack electrofishing at six sites along this Mattapoisett River AU (MA95-36) from up to downstream as follows: below flume at Hartley Reservoir WMA (SampleID 8513, July 2019), Rt 105 Rounesville Rd. (SampleID 6488, June 2017), ~3350' upstream (US) New Bedford Rd/Perry Hill Rd. (SampleID 5063, September 2013); Perry Hill Rd/ New Bedford Rd, working US (SampleID 6489, June 2017); Wolf Island Rd - US (SampleID 6490, June 2017) and ~5250' US Acushnet Rd (SampleID 5062, September 2013). The samples were all indicative of good conditions for low-moderate gradient habitat, with fluvial individuals documented at all sites except the most upstream and moderately tolerant/intolerant macrohabitat generalists comprising 62, 69, 3, 68, 26, and 24% of the samples, respectively. DMF biologists note four minor barriers to diadromous fish passage (targeted species river herring and American eel, population score "5"): Snipatuit Pond dam (with fishway, passage score 0), the fish hatchery US Hartley Rd/Freeman Bog Dam (passage score 2), the Rounesville Rd dam (mill remnants) (passage score 0), and Wolf Island Rd bog culverts (passage score 3). Benthic and water quality monitoring was conducted by MassDEP staff US of New Bedford Rd (B0855, W2397) and upstream of Acushnet Rd (B0847, W2388) in summer 2013, as part of the MAP2 monitoring project. The benthic community sample IBI scores (Statewide low gradient index) were indicative of moderately degraded conditions (43) in the river upstream of New Bedford Rd (B0855) and satisfactory conditions (65) further downstream near Acushnet Rd (B0847). Water quality sampling data (deployed probe and discrete samples) at these sites can be summarized up to downstream as follows: minimum dissolved oxygen (DO) 4.8/4.1mg/L (97 and 41 day deploys) with 7DADMin for DO always >5.0mg/L, max temperature 27.5/26.9°C with max 24hr rolling avg 25.8/26.3°C (four 98 day deploys), pH 6.1-6.4/6.0-6.6SU (n=3 at each site). There were generally no physico-chemical indicators of nutrient enrichment (seasonal average total phosphorus concentrations 0.051/0.056mg/L (n=4), max diel DO shift 1.6/3.1mg/L, max DO saturation both sites 93%, and no observations of any dense/very dense filamentous algae (n=4)). Except for chronic lead criteria exceedances (two at each site, TUs 2.4 to 4.8) there were no other toxicant issues (max total ammonia 0.04mg/L and chloride 13mg/L, n=4 at each site) with no other exceedances of any clean metals or aluminum samples (n=2), although dissolved Al data were compared to total recoverable Al criteria, so exceedances cannot be ruled out. Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at Fairhaven Rd (Rt. 6) just upstream of the Mattapoisett River Dam (BBC_MR1) in the summers of 2015 to 2019. Monitoring was conducted in the surface waters and average depths of ~0.3-0.5m, weekly (between 6 & 9am). The max temperature was 29.5°C (n=95, once >28.3°C), minimum DO 3.1mg/L (n=88, <5.0mg/L six times between May-July, and <4.0mg/L twice). Seasonal avg total phosphorus ranged from 0.013 to 0.024mg/L (n=20, max 0.033mg/L) and the max chlorophyll <i>a</i> was 25.05µg/L (n=20, >16µg/L just once). Secchi disk depths ranged from 0.4-0.8m (n=14). Ammonia-N concentrations were low (0.05 to 0.057mg/L, n=20), though TU's could not be calculated (lack of quality assured pH and salinity data).</p> <p>The Aquatic Life Use for this Mattapoisett River AU (MA95-36) is assessed as Not Supporting due to the moderately degraded benthic conditions documented by MassDEP staff in the river upstream of New Bedford Road, Rochester in 2013. Alerts for elevated lead concentrations at the two sampling sites and low DO at the downstream end of the river are also being identified. The prior alert related to potential impacts on flow as a result of groundwater withdrawals and/or cranberry bog manipulations or other flow manipulations is being carried forward.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
5062	MassDEP	Fish Community	Mattapoissett River	~5250 ft US/N of Achusnet Rd, ~350 ft US of confluence w/ UNT outlet of Tinkam Pond	41.67967	-70.84083
5063	MassDEP	Fish Community	Mattapoissett River	~3350 ft US/N of New Bedford Rd/Perry Hill Rd	41.72741	-70.85636
6488	MassDFG	Fish Community	Mattapoissett River	Rt 105 Rounesville road., Rochester	41.73525	-70.86168
6489	MassDFG	Fish Community	Mattapoissett River	Perry Hill Rd/ New Bedford Rd xing, working US., Rochester	41.71977	-70.85841
6490	MassDFG	Fish Community	Mattapoissett River	Wolf Island Rd xing- US, Church Hamstead WMA, Rochester	41.70592	-70.84328
8513	MassDFG	Fish Community	Mattapoissett River	below flume at Hartley Reservoir WMA, Rochester	41.74480	-70.86350
B0847	MassDEP	Benthic	Mattapoissett River/	[approximately 1600 meters upstream/north of Acushnet Road, Mattapoissett, MA (approximately 105 meters upstream of confluence of unnamed tributary, outlet of Tinkham Pond)]	41.679671	-70.840825
B0855	MassDEP	Benthic	Mattapoissett River/	[approximately 1020 meters upstream/north of New Bedford Road, Rochester, MA]	41.727408	-70.856356
W2388	MassDEP	Water Quality	Mattapoissett River	[approximately 5250 feet upstream/north of Acushnet Road, Mattapoissett (approximately 350 feet upstream of confluence of unnamed tributary, outlet of Tinkham Pond)]	41.679671	-70.840825
W2397	MassDEP	Water Quality	Mattapoissett River	[approximately 3350 feet upstream/north of New Bedford Road, Rochester]	41.727408	-70.856356

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_MR1	Buzzards Bay Coalition	Water Quality	Mattapoissett River	Mattapoissett River, Mattapoissett	41.657125	-70.834282

Biological Monitoring Information

Benthic Macroinvertebrate Data

MassDEP Benthic Macroinvertebrate Data (2011-2017). (MassDEP Undated5)

[Index Biological Condition Class: E= Exceptional, S= Satisfactory, MD= Moderately Degraded, SD= Severely Degraded; High Gradient IBI Thresholds: E= 100-75, S= 74-55, MD= 54-35, SD= 34-0; Low Gradient IBI Thresholds: E= 100-81, S= 80-62, MD= 61-38, SD= 37-0; R qualifier = Rarefaction (100ct) <55]

Station Code	Collection Date	Collection Method	Index Type	Organism Count	Index Score	Index Biological Condition Class
B0847	07/03/13	RBP multihab	Statewide_Low_Gradient	289	65	S
B0855	07/02/13	RBP multihab	Statewide_Low_Gradient	317	43	MD

Fish Community Data and DELTS

Fish Community Data (2012-2019) Provided by MassDFG. (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net, Gradient: H = High, L = Low; I/MT MG= Intolerant/Moderately Tolerant Macrohabitat Generalist]

[Species List: A = Alewife, AE = American Eel, B = Bluegill, BB = Brown Bullhead, BS = Banded Sunfish, BT = Brown Trout, CCS = Creek Chubsucker, CP = Chain Pickerel, GS = Golden Shiner, P = Pumpkinseed, RP = Redfin Pickerel, TD = Tesselated Darter]

Sample ID	Sample Date	Method	Sample Type	Gradient	Total Taxa	Total Ind	Cold Ind %	Fluvial Taxa	Fluvial Ind %	Intol Ind %	I/MT MG Taxa	I/MT MG Ind %	Notables	CFR	Species List
5062	09/03/13	NS	TP		5	89	0%	1	15%	0%	2	24%	No	No	AE, CP, GS, RP, TD,
5063	09/03/13	NS	TP		3	34	0%	1	21%	3%	1	3%	No	No	AE, BS, TD,
6488	06/22/17	BP	TP	L	8	156	0%	2	5%	1%	4	69%	No	No	A, AE, B, CCS, CP, P, RP, TD,
6489	06/22/17	BP	TP		7	118	2%	3	3%	3%	3	68%	No	No	A, AE, BT, CCS, CP, RP, TD,
6490	06/22/17	BP	TP		7	23	0%	1	13%	0%	3	26%	No	No	AE, B, CP, GS, P, RP, TD,
8513	07/01/19	BP	TP	L	6	66	0%	0	0%	50%	2	62%	No	No	AE, B, BB, BS, GS, P,

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note four barriers providing adequate passage to diadromous fish throughout this Mattapoissett River AU. The targeted species at all four structures are river herring and American eel, with a population score of "5". From upstream to downstream the structures are: The Snipatuit Pond dam (with existing fishway), was given a passage score of "0" on a 0-10 scale (with 10 equating to no possible passage), indicating that the dam is not an obstruction to the passage of diadromous fish between the river and the upstream AU (Snipatuit Pond MA95137). The fish hatchery, located just upstream of Hartley Road in Rochester (associated with the Freeman Bog Dam (NATID# MA00385), which marks the downstream extent of the Long Pond Bog area), was given a passage score of "2" (minor obstruction). It was also noted that there is a bypass to the dam in place which offers adequate fish passage. The Rounseville Road Dam (in effect mill remnants) was given a passage score of "0", (not an obstruction). The Wolf Island Road bog culverts, located roughly half way down the AU, were given a passage score of "3" (minor obstruction). It was also noted that water diversion for the bog at the main stem could be improved.

Physico-chemical Water Quality Information

DO, pH, Temperature

MassDEP Long-term Continuous Dissolved Oxygen Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[7DADMin= 7-Day Average of the Daily Minima, 7DADA= 7-Day Average of the Daily Average, CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Day Count	7day Count	30day Count	DO Min (mg/L)	Min 7DADMin (mg/L)	Min 7DADA (mg/L)	Delta DO Max (mg/L)	Count CW 7DADMin <6.0	Count CW 1Day Min <5.0	Count WW Early Life Stages 7DADA <6.5	Count WW Early Life Stages 1Day Min <5.0	Count WW Other Life Stages 7DADMin <5.0	Count WW Other Life Stages 1Day Min <4.0	Count CW 30DADA <8.0	Count WW Other Life Stages 30DADA <6.0
W2388	06/06/13	09/10/13	41	29	0	4.1	5.4	5.8	3.1	7	2	8	0	0	0	0	0
W2397	06/06/13	09/10/13	97	91	68	4.8	5.1	5.5	1.6	30	2	43	2	0	0	68	13

MassDEP Discrete Dissolved Oxygen Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
W2388	06/05/13	09/11/13	3	7	7.9	0	0	0
W2397	06/05/13	09/11/13	3	6.3	7.5	0	0	0

MassDEP Long-term Continuous Temperature Data (Summer Index 2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; Max Daily Mean= Maximum 24-Hour Average, 7DADM= 7-Day Average of the Daily Maxima, 7DADA= 7-Day Average of the Daily Average, CW= Coldwater, WW= Warmwater; NOTE: In the case of more than one row of data in the same year for a site, different types of temperature probes were deployed.]

Station Code	Start Date	End Date	Index Count	7day Count	Max Daily Mean (°C)	Max Temp (°C)	Max 7DADM (°C)	Max 7DADA (°C)	Count CWTier1 7DADM >20	Count CWTier1 Daily Mean >23.5	Count CWTier2 7DADA >21	Count CWTier2 Daily Mean >24.1	Count WW 7DADM >27.7	Count WW Daily Mean >28.3
W2388	06/06/13	09/10/13	68	56	25.7	26.5	25.7	24.8	42	11	21	6	0	0
W2388	06/06/13	09/10/13	97	91	26.3	26.9	25.9	25.1	75	19	41	12	0	0
W2397	06/06/13	09/10/13	97	91	25.7	27.4	26.3	25.0	70	18	36	10	0	0
W2397	06/06/13	09/10/13	97	91	25.8	27.5	26.4	25.1	74	19	38	14	0	0

24-hour Rolling Average Calculations for MassDEP Short- and Long-term Continuous Temperature Data (Summer Index 2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater; NOTE: In the case of more than one row of data in the same year for a site, different types of temperature probes were deployed.]

Station Code	Start Date	End Date	Count Days Deployed	24hr Rolling Count	Max 24hr Avg Rolling Temp (°C)	Count CWTier1 24hr Avg Rolling >23.5 °C	Count CWTier2 24hr Avg Rolling >24.1 °C	Count WW 24hr Avg Rolling >28.3°C
W2388	06/05/13	09/11/13	98	4656	26.3	922	552	0
W2388	06/05/13	09/11/13	98	3216	25.7	487	260	0
W2397	06/05/13	09/11/13	98	4655	25.8	953	587	0
W2397	06/05/13	09/11/13	98	4655	25.7	874	524	0

MassDEP Discrete Temperature Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
W2388	06/05/13	09/11/13	5	5	24.8	20.3	1	1	0	0
W2397	06/05/13	09/11/13	5	5	26.5	21.8	5	1	0	0

MassDEP Discrete pH Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

Station Code	Start Date	End Date	pH Count	pH Min (SU)	pH Max (SU)	pH Count <6.5 & >8.3	pH Count <6.0 & >8.8
W2388	06/05/13	09/11/13	3	6	6.6	1	0
W2397	06/05/13	09/11/13	3	6.1	6.4	3	0

Buzzards Bay Coalition Freshwater Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Average Sample depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
BBC_MR1	05/29/15	08/26/15	0.2	10	5.5	6.8	0	0	0
BBC_MR1	05/29/15	08/29/15	0.5	13	4.4	6.1	3	2	0
BBC_MR1	06/06/16	09/20/16	0.2	6	5.0	5.9	0	0	0
BBC_MR1	06/17/16	06/30/16	0.3	3	4.5	5.5	1	1	0
BBC_MR1	06/12/17	09/20/17	0.2	9	4.7	5.9	1	1	0
BBC_MR1	06/12/17	09/20/17	0.5	13	3.1	5.4	4	2	1
BBC_MR1	06/05/18	06/20/18	0.2	2	6.0	7.0	0	0	0
BBC_MR1	06/05/18	09/18/18	0.5	12	3.7	6.2	1	0	1
BBC_MR1	05/30/19	09/18/19	0.2	20	5.5	7.3	0	0	0

Buzzards Bay Coalition Discrete Freshwater Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_MR1	05/29/15	08/26/15	0.2	14	13	24.5	22.1	11	6	0	0
BBC_MR1	05/29/15	08/29/15	0.5	13	12	24.0	21.6	9	5	0	0
BBC_MR1	06/06/16	09/20/16	0.2	10	9	29.5	23.8	6	5	1	0
BBC_MR1	06/17/16	06/30/16	0.3	3	3	21.0	19.7	1	0	0	0
BBC_MR1	06/12/17	09/20/17	0.2	12	10	24.5	20.7	7	2	0	0
BBC_MR1	06/12/17	09/20/17	0.4	13	11	21.7	19.8	5	0	0	0
BBC_MR1	06/05/18	08/21/18	0.2	6	6	24.5	20.9	5	2	0	0
BBC_MR1	06/05/18	09/18/18	0.5	12	11	24.3	20.0	6	2	0	0
BBC_MR1	05/30/19	09/18/19	0.2	22	20	24.5	19.7	8	4	0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)**MassDEP Nutrient Enrichment Indicator Data (2011-2018).** (MassDEP Undated11) (MassDEP Undated6)

[Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	Delta DO Max (mg/L)	Delta DO Avg (mg/L)	DO Sat Max (%)	pH Max (SU)	Count Algal Obsv.	Dense/V. Dense Film/Fila. Algae
W2388	2013	5	0.043	0.072	0.056	3.1	0.8	93.2	6.6	3	0
W2397	2013	5	0.038	0.065	0.051	1.6	0.6	93.4	6.4	6	0

Buzzards Bay Coalition Freshwater Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	DO Sat Max (%)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count >16µg/L
BBC_MR1	2015	0.2	4	0.010	0.033	0.023	--	4	1.85	25.05	11.38	1
BBC_MR1	2016	0.2	4	0.015	0.015	0.015	--	4	4.79	15.39	8.16	0
BBC_MR1	2017	0.2	4	0.011	0.025	0.016	--	4	2.15	11.86	5.31	0
BBC_MR1	2018	0.2	4	0.011	0.015	0.013	--	4	0.90	11.08	5.52	0
BBC_MR1	2019	0.2	4	0.016	0.029	0.024	--	4	0.10	2.28	1.02	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_MR1	07/01/15	07/07/15	2	0.7	0.7	0.7
BBC_MR1	06/06/16	06/06/16	1	0.7	0.7	0.7
BBC_MR1	06/20/17	08/03/17	4	0.5	0.8	0.6
BBC_MR1	06/05/18	08/20/18	2	0.4	0.6	0.5
BBC_MR1	06/09/19	09/05/19	5	0.4	0.6	0.5

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

MassDEP Clean Metals Water Column Data (2011-2018), Acute Criteria Violations. (MassDEP Undated11) (MassDEP Undated6)

[CMC= Criterion Maximum Concentration, TU= Toxic Unit]

Station Code	Data Year	Metals Count	As CMC TU >1	Cd CMC TU >1	Cr III CMC TU >1	Cu CMC TU >1	Pb CMC TU >1	Ni CMC TU >1	Ag CMC TU >1	Zn CMC TU >1
W2388	2013	2	0	0	0	0	0	0	0	0
W2397	2013	2	0	0	0	0	0	0	0	0

MassDEP Clean Metals Water Column Data (2011-2018), Chronic Criteria Violations. (MassDEP Undated11) (MassDEP Undated6)

[CCC= Criterion Continuous Concentration, TU= Toxic Unit]

Station Code	Data Year	Metals Count	As CCC TU >1	Cd CCC TU >1	Cr III CCC TU >1	Cu CCC TU >1	Pb CCC TU >1	Ni CCC TU >1	Se CCC TU >1	Zn CCC TU >1
W2388	2013	2	0	0	0	0	2	0	0	0
W2397	2013	2	0	0	0	0	2	0	0	0

MassDEP Clean Metals Water Column Data (2011-2018), Selected TU Calculations. (MassDEP Undated11) (MassDEP Undated6)

[CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

Station Code	Sample Date	Cd CMC TU	Cd CCC TU	Cu CMC TU	Cu CCC TU	Pb CMC TU	Pb CCC TU
W2388	05/17/13	0.4	0.6	0.6	0.74	0.2	4.4
W2388	06/28/13	0.4	0.7	0.7	0.85	0.2	4.8

Station Code	Sample Date	Cd CMC TU	Cd CCC TU	Cu CMC TU	Cu CCC TU	Pb CMC TU	Pb CCC TU
W2397	05/17/13	0.3	0.6	0.5	0.62	0.1	2.4
W2397	06/28/13	0.4	0.7	0.6	0.75	0.2	4.2

MassDEP Dissolved Aluminum Water Column Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Since only dissolved aluminum data were available, these data were compared to the default freshwater criteria for total recoverable aluminum (TRA), presented in Appendix E of MassDEP's 2022 CALM. As dissolved Al is a fraction of TRA, an exceedance count of 0 does not rule out violations of the TRA criteria. CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

Station Code	Data Year	Dissolved Al Count	Al Min (mg/L)	Al Max (mg/L)	Al Avg (mg/L)	Al CMC TU Max	Al CCC TU Max	Al CMC TU >1	Al CCC TU >1
W2388	2013	2	0.180	0.21	0.195	0.5	0.9	0	0
W2397	2013	2	0.130	0.15	0.140	0.3	0.7	0	0

MassDEP Total Ammonia Nitrogen (TAN) Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[TAN= NH₃ + NH₄⁺]

Station Code	Data Year	TAN Count	TAN Min (mg/L)	TAN Max (mg/L)	TAN Avg (mg/L)	Count TAN >Chronic	Count TAN >Acute
W2388	2013	4	0.020	0.040	0.033	0	0
W2397	2013	4	0.020	0.030	0.025	0	0

MassDEP Chloride Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Chloride Count	Chloride Min (mg/L)	Chloride Max (mg/L)	Chloride Avg (mg/L)	Count Chloride >230	Count Chloride >860
W2388	2013	4	6	13	11	0	0
W2397	2013	4	7	13	11	0	0

MassDEP Discrete Specific Conductance Data (2011-2018) Compared to Estimated Chloride Criteria. (MassDEP Undated11) (MassDEP Undated6)

Station Code	Start Date	End Date	SpCond Count	SpCond Min (µS/cm)	SpCond Max (µS/cm)	Count SpCond >904	Count SpCond >994	Count SpCond >3193	Count SpCond >3512	Consecutive sets >904	Consecutive sets >994
W2388	06/05/13	09/11/13	3	65	88	0	0	0	0	0	0
W2397	06/05/13	09/11/13	3	67	85	0	0	0	0	0	0

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH ₃ Count	NH ₃ Min (mg/L)	NH ₃ Max (mg/L)	NH ₃ Avg (mg/L)
BBC_MR1	07/13/15	08/25/15	0.2	4	0.016	0.041	0.029
BBC_MR1	07/05/16	08/15/16	0.2	4	0.005	0.033	0.018
BBC_MR1	07/06/17	08/17/17	0.2	4	0.013	0.057	0.026
BBC_MR1	07/10/18	08/21/18	0.2	4	0.010	0.023	0.016

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_MR1	07/11/19	08/15/19	0.2	4	0.015	0.039	0.023

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Mattapoisett River AU (MA95-36); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff conducted field surveys for this Mattapoisett River AU (MA95-36) at two sites during the summer of 2013 as part of the MAP2 monitoring project. The site descriptions are as follows: approximately 3350 feet upstream/north of New Bedford Road in Rochester (W2397) and farther downstream approximately 5250 feet upstream/north of Acushnet Road in Mattapoisett (approximately 350 feet upstream of confluence of unnamed tributary, outlet of Tinkham Pond) (W2388). There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crew at either site (n=7 for both).</p> <p>The Aesthetics Use for this Mattapoisett River AU (MA95-36) is assessed as Fully Supporting based on the general lack of any objectionable conditions documented during surveys conducted by MassDEP staff during the summer of 2013.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2388	MassDEP	Water Quality	Mattapoisett River	[approximately 5250 feet upstream/north of Acushnet Road, Mattapoisett (approximately 350 feet upstream of confluence of unnamed tributary, outlet of Tinkham Pond)]	41.679671	-70.840825
W2397	MassDEP	Water Quality	Mattapoisett River	[approximately 3350 feet upstream/north of New Bedford Road, Rochester]	41.727408	-70.856356

Aesthetic Observations

Aesthetics Summary Statements for MassDEP Stations (2011-2018) (MassDEP Undated6)

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W2388	Mattapoisett River	2013	7	MassDEP aesthetics observations for station W2388/MAP2-380 on Mattapoisett River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013.
W2397	Mattapoisett River	2013	7	MassDEP aesthetics observations for station W2397/MAP2-404 on Mattapoisett River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013.

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W2388	2013	7	3	0
W2397	2013	7	6	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W2388	Mattapoissett River	2013	Color	Dark Tan	1	7
W2388	Mattapoissett River	2013	Color	Reddish	5	7
W2388	Mattapoissett River	2013	Color	Rusty	1	7
W2388	Mattapoissett River	2013	Objectionable Deposits	No	7	7
W2388	Mattapoissett River	2013	Odor	Musty (Basement)	1	7
W2388	Mattapoissett River	2013	Odor	None	6	7
W2388	Mattapoissett River	2013	Scum	No	7	7
W2388	Mattapoissett River	2013	Turbidity	None	7	7
W2397	Mattapoissett River	2013	Color	Dark Tan	1	7
W2397	Mattapoissett River	2013	Color	Light Yellow/Tan	1	7
W2397	Mattapoissett River	2013	Color	Reddish	5	7
W2397	Mattapoissett River	2013	Objectionable Deposits	No	7	7
W2397	Mattapoissett River	2013	Odor	None	6	7
W2397	Mattapoissett River	2013	Odor	NR	1	7
W2397	Mattapoissett River	2013	Scum	No	7	7
W2397	Mattapoissett River	2013	Turbidity	None	7	7

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>UMass Dartmouth volunteers collected <i>Enterococci</i> bacteria samples at the upstream end of this Mattapoissett River AU (MA95-36) at Snipatuit Rd in Rochester (UMassD_2) between June and September 2019 (n=16). Further downstream, MassDEP staff collected <i>E. coli</i> bacteria samples at two locations in 2013 as part of the MAP2 monitoring project: approximately 3350 feet upstream/north of New Bedford Road in Rochester (W2397) between May and September 2013 (n=5), and approximately 5250 feet upstream/north of Acushnet Road in Mattapoissett (approximately 350 feet upstream of the confluence of the unnamed tributary, outlet of Tinkham Pond) (W2388) between May and September 2013 (n=5). Data analysis indicated that 81% of intervals at site UMassD_2 (for <i>Enterococcus</i>) had GM's >35 cfu/100 ml and three samples exceeded the 130 cfu/100 ml STV. However, the <i>E. coli</i> concentrations did not exceed the use attainment impairment threshold for the single year low frequency datasets; at site W2397 (<i>E. coli</i>) 33% of intervals had GM's >126 cfu/100 ml, and one sample exceeded the 410 cfu/100ml STV, with a seasonal GM of 79. At site W2388 (<i>E. coli</i>) none of the intervals had GM's >126 cfu/100 ml, no samples exceeded the 410 cfu/100 ml STV, and the seasonal GM was 92 cfu/100 ml.</p> <p>The Primary Contact Recreational Use for this Mattapoissett River AU (MA95-36) will continue to be assessed as Not Supporting based on the <i>Enterococci</i> data collected at the upstream end of the AU by UMass Dartmouth volunteers in 2019, which exceeded the use attainment impairment threshold for that single year high frequency dataset. While the <i>E. coli</i> impairment is being retained at the request of EPA, it is noted here that the <i>E. coli</i> data collected by MassDEP staff during the summer of 2013 at two sites along this Mattapoissett River AU did not exceed use attainment impairment thresholds). Additional bacteria sampling is being recommended.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2388	MassDEP	Water Quality	Mattapoissett River	[approximately 5250 feet upstream/north of Acushnet Road, Mattapoissett (approximately 350 feet upstream of confluence of unnamed tributary, outlet of Tinkham Pond)]	41.679671	-70.840825
W2397	MassDEP	Water Quality	Mattapoissett River	[approximately 3350 feet upstream/north of New Bedford Road, Rochester]	41.727408	-70.856356
UMassD_2	UMass Dartmouth	Water Quality	Mattapoissett River	201 Snipatuit Rd, Rochester, MA.	41.75191	-70.859939

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP Undated11) (MassDEP Undated6) (UMass-Dartmouth 2019) (MassDEP Undated4)
 [Result units are CFU/100ml or MPN/100ml]

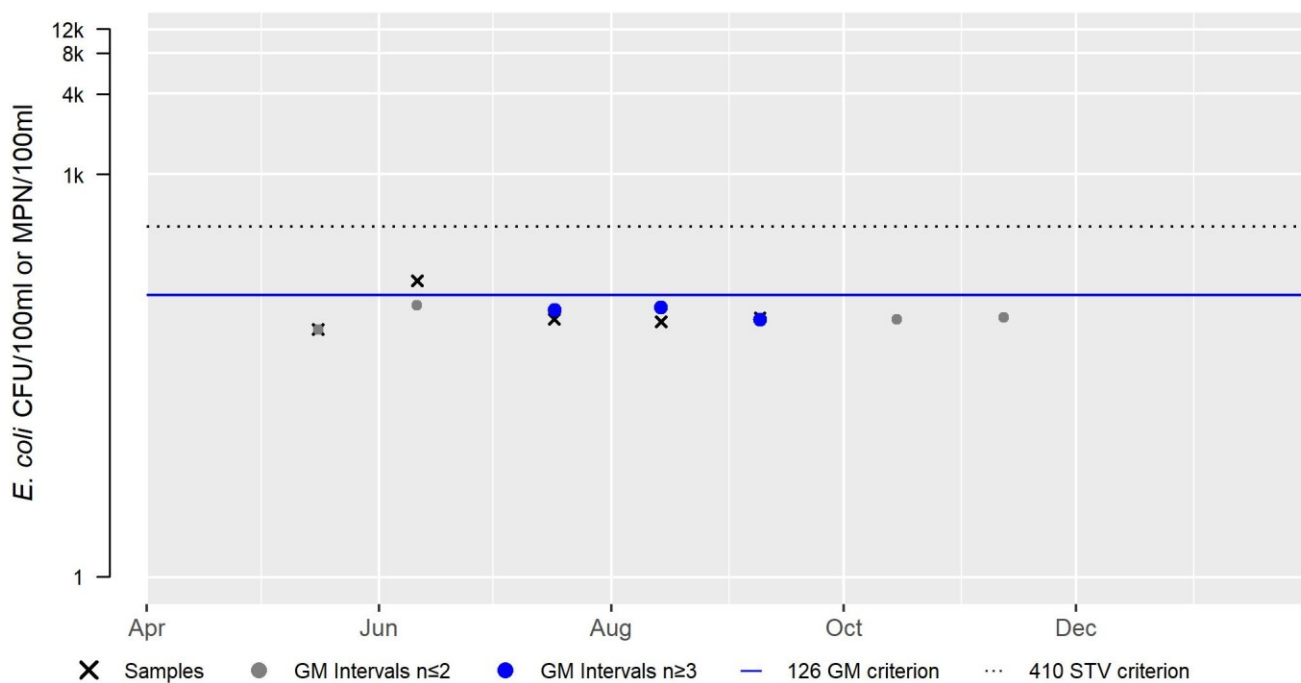
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
W2388	MassDEP	E. coli	05/16/13	09/09/13	5	70	161	92
W2397	MassDEP	E. coli	05/16/13	09/09/13	5	22	798	79
UMassD_2	UMass Dartmouth	Enterococci	06/13/19	09/23/19	16	1	414	42

W2388 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	5
SeasGM	92
#GMI	3
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2013

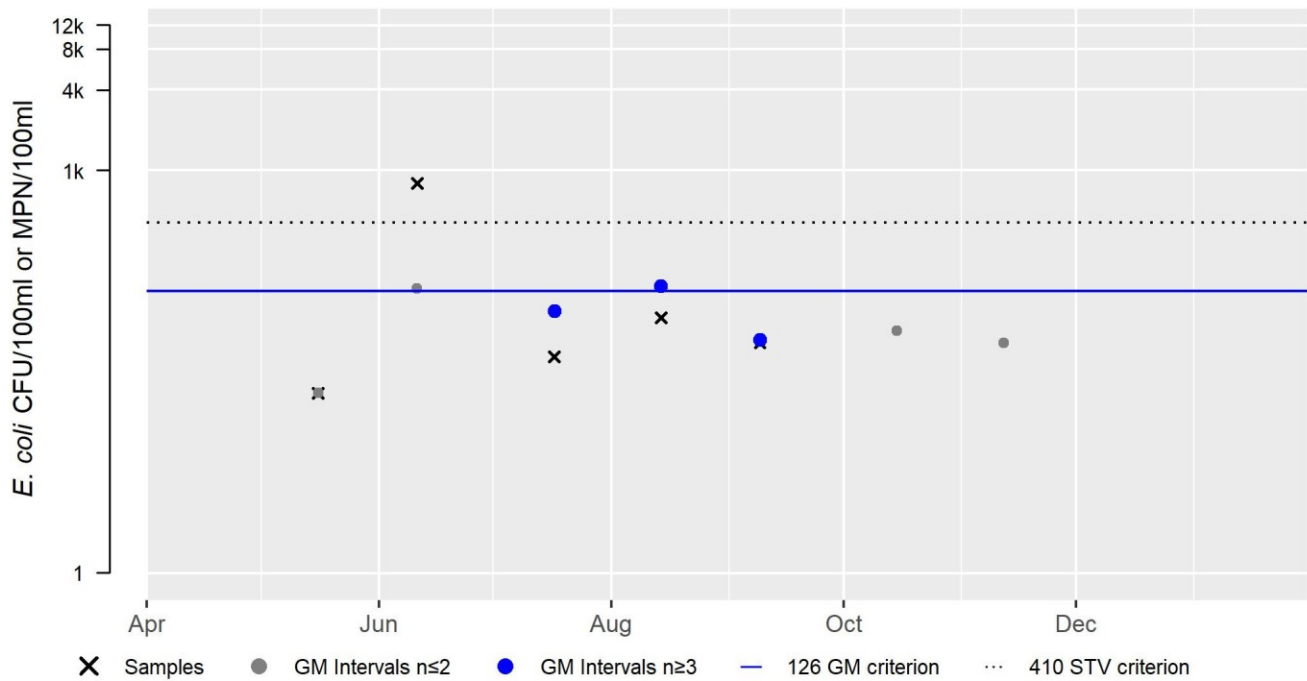


W2397 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	5
SeasGM	79
#GMI	3
#GMI Ex	1
%GMI Ex	33
n>STV	1
%n>STV	20

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2013

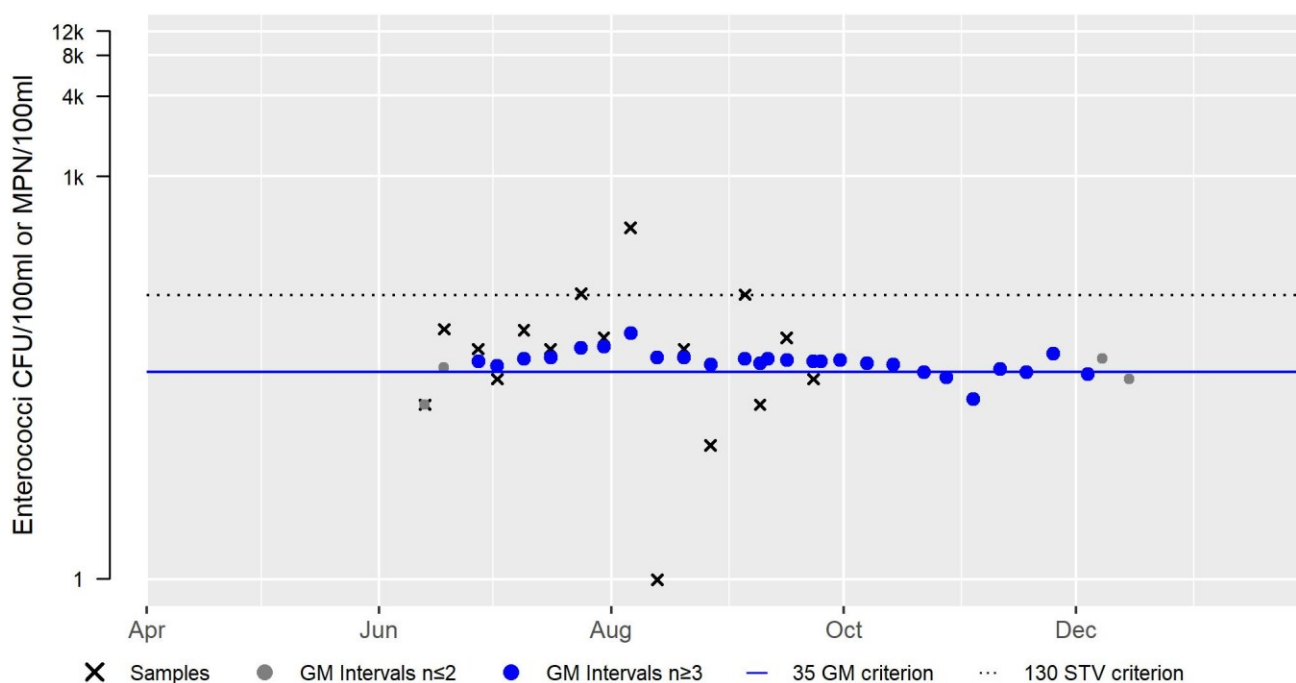


UMassD_2 Enterococci (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	16
SeasGM	42
#GMI	26
#GMI Ex	21
%GMI Ex	81
n>STV	3
%n>STV	19

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2019



Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff collected <i>E. coli</i> bacteria samples at two locations in 2013 as part of the MAP2 monitoring project; approximately 3350 feet upstream/north of New Bedford Road in Rochester (W2397) between May and September 2013 (n=5), and approximately 5250 feet upstream/north of Acushnet Road in Mattapoisett (approximately 350 feet upstream of the confluence of the unnamed tributary, outlet of Tinkham Pond) (W2388) between May and September 2013 (n=5). Data analysis indicated that none of the intervals had GM's >630 cfu/100 ml and no samples exceeded the 1260 cfu/100 ml STV. The seasonal GM's were 79 and 92 cfu/100 ml from upstream to downstream, respectively. Since the <i>E. coli</i> concentrations did not exceed the use attainment impairment threshold for these two single year low frequency datasets, the Secondary Contact Recreational Use for this Mattapoisett River AU (MA95-36) is assessed as Fully Supporting.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2388	MassDEP	Water Quality	Mattapoissett River	[approximately 5250 feet upstream/north of Acushnet Road, Mattapoissett (approximately 350 feet upstream of confluence of unnamed tributary, outlet of Tinkham Pond)]	41.679671	-70.840825
W2397	MassDEP	Water Quality	Mattapoissett River	[approximately 3350 feet upstream/north of New Bedford Road, Rochester]	41.727408	-70.856356

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP Undated11) (MassDEP Undated6)
 [Result units are CFU/100ml or MPN/100ml]

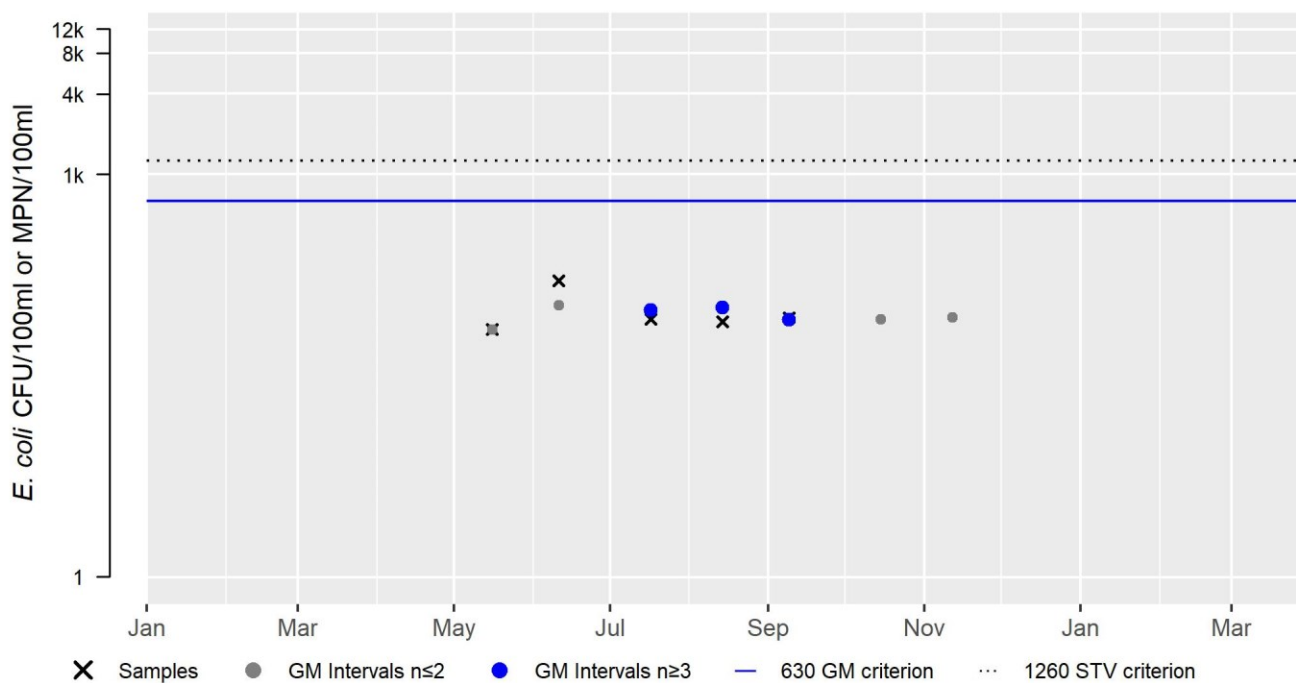
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
W2388	MassDEP	E. coli	05/16/13	09/09/13	5	70	161	92
W2397	MassDEP	E. coli	05/16/13	09/09/13	5	22	798	79

W2388 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	5
SeasGM	92
#GMI	3
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2013

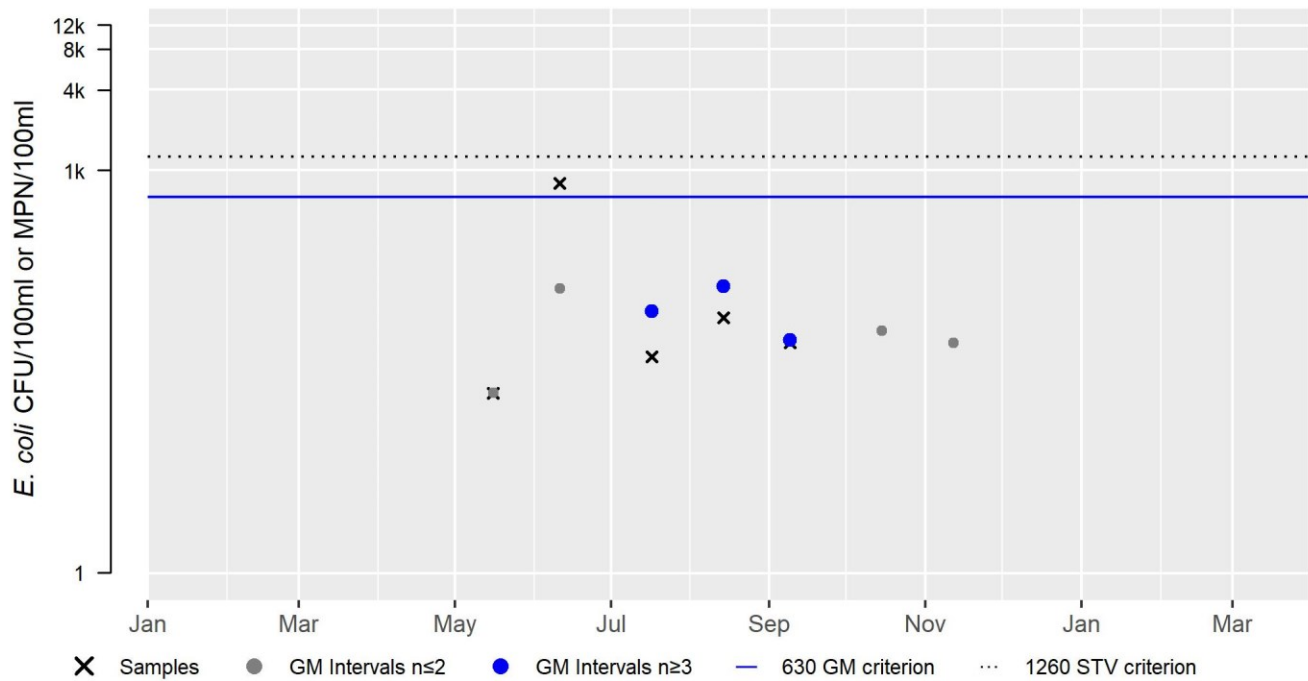


W2397 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	5
SeasGM	79
#GMI	3
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2013



Mattapoisett River (MA95-60)

Location:	From the Mattapoisett River Dam (#MA02447) at Fairhaven Road (Route 6), Mattapoisett to the mouth at Mattapoisett Harbor, Mattapoisett.
AU Type:	ESTUARY
AU Size:	0.04 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	5	Dissolved Oxygen		Added
4a	5	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			

Recommendations

2022 Recommendations
ALU: Conduct total nitrogen sampling (at least three times per season at mid-ebb tide), to better evaluate whether or not concentrations are elevated in this Mattapoisett River AU (MA95-60) that may warrant an impairment decision.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at two locations in this Mattapoisett River AU, Mattapoisett (MA95-60) in the summers of 2015-2019 as follows; halfway down the AU at the Phoenix rail trail (BBC_MH3) and close to the western shore towards the downstream end of the AU at BBC_MH3A. Monitoring was conducted in the surface waters, as well as at depths ranging 0.8-1.2m at BBC_MH3 and 0.7-0.8m at BBC_MH3A, and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 28.0°C (n=172) and the minimum dissolved oxygen (DO) was 0.7mg/L (n=174), frequently measuring <6.0mg/L (74% of all measurements, including those at surface and depth) with severe excursions (i.e., <5.0mg/L) also occurring frequently (57% of all measurements). Nutrient sampling efforts (ebb tides in July and August n=16, maximum 1.2mg/L) documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.4-0.79mg/L at BBC_MH3 in 2015, 2016, 2018, and 2019, >0.5mg/L only in 2019). The maximum chlorophyll *a* concentration was 8.98µg/L (n=16); >5µg/L four times. Secchi disk depths ranged from 0.3-2.0m (both locations). Ammonia-nitrogen concentrations were generally low (range 0.006 to 0.08mg/L, n=16), although TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for Mattapoisett River (MA95-60) is assessed as Not Supporting based on BBC data indicating frequent low DO conditions (2015-2019). An impairment for Dissolved Oxygen is being added. BBC requested that a Total Nitrogen impairment be added for Mattapoisett Harbor “incidences of high total nitrogen concentrations with a long-term average (1992-2020) in the inner Mattapoisett Harbor ranging from 0.37-0.56mg/L”. Data from BBC station MH3 (in this Mattapoisett River AU) were incorporated into their comment so were considered for this AU as well. BBC seasonal average total nitrogen data (2015-2019) indicated only one incidence of a seasonal average >0.5mg/L (the MEP critical indicator threshold for waters where eelgrass has not been documented), so MassDEP did not identify Total Nitrogen as an impairment at this time but, in consideration of the intermittently high concentrations (>0.5mg/L) documented by the BBC and the presence of eelgrass bed habitat in the AU downstream, an Alert for Total Nitrogen is being identified for this Mattapoisett River AU (MA95-60) and a recommendation is being made that additional data continue to be collected.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_MH3	Buzzards Bay Coalition	Water Quality	Mattapoisett Harbor	Mattapoisett Harbor River Mouth, Mattapoisett	41.651743	-70.827858
BBC_MH3A	Buzzards Bay Coalition	Water Quality	Mattapoisett Harbor	Mattapoisett Harbor River Mouth, Mattapoisett	41.648887	-70.826219

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_MH3	06/05/15	09/23/15	0.2	14	3.5	5.2	71	43	14
BBC_MH3	06/18/15	09/01/15	1.0	10	3.2	4.9	80	60	20
BBC_MH3	06/07/16	09/20/16	0.2	10	3.2	5.1	80	30	20
BBC_MH3	06/07/16	09/20/16	1.0	8	3.0	5.0	100	38	25
BBC_MH3	06/12/17	09/20/17	0.2	10	0.9	4.6	60	60	20
BBC_MH3	06/12/17	09/20/17	1.2	10	0.7	3.9	80	70	40
BBC_MH3	05/31/18	09/18/18	0.2	8	3.3	6.0	38	13	13
BBC_MH3	06/05/18	09/18/18	0.8	14	2.4	4.3	86	71	43
BBC_MH3	06/04/19	09/23/19	0.2	21	3.5	6.8	33	5	5
BBC_MH3	07/02/19	07/09/19	1.2	2	4.7	5.3	50	50	0
BBC_MH3A	09/03/15	09/20/15	0.5	4	3.5	4.8	75	50	25

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_MH3A	05/31/16	09/24/16	0.1	6	2.0	4.0	83	83	50
BBC_MH3A	06/06/16	08/31/16	0.8	12	3.0	4.8	75	67	8
BBC_MH3A	05/31/17	08/16/17	0.1	5	3.5	4.0	100	100	20
BBC_MH3A	06/07/17	09/12/17	0.7	12	3.5	4.8	75	58	25
BBC_MH3A	06/11/18	09/19/18	0.1	7	1.5	2.6	100	100	86
BBC_MH3A	06/05/18	09/15/18	0.7	10	1.5	3.0	100	100	80
BBC_MH3A	06/10/19	06/10/19	0.2	1	4.5	4.5	100	100	0
BBC_MH3A	06/04/19	09/10/19	0.7	10	2.5	3.9	100	80	40

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_MH3	06/05/15	09/23/15	0.2	18	16	26.7	22.5	0
BBC_MH3	06/18/15	09/01/15	1.0	10	10	26.6	23.5	0
BBC_MH3	06/07/16	09/20/16	0.2	14	13	27.0	23.1	0
BBC_MH3	06/07/16	09/20/16	1.0	8	7	26.7	22.7	0
BBC_MH3	06/12/17	09/20/17	0.2	11	10	24.5	21.3	0
BBC_MH3	06/12/17	09/20/17	1.0	10	9	23.9	21.0	0
BBC_MH3	05/31/18	09/18/18	0.2	11	9	24.0	21.1	0
BBC_MH3	06/05/18	09/18/18	0.7	14	13	26.7	22.9	0
BBC_MH3	05/30/19	09/23/19	0.2	25	22	23.5	19.5	0
BBC_MH3	07/02/19	07/09/19	1.2	2	2	22.9	22.4	0
BBC_MH3A	09/03/15	09/20/15	0.5	4	3	27.5	24.8	0
BBC_MH3A	05/31/16	09/24/16	0.1	6	4	28.0	25.3	0
BBC_MH3A	06/06/16	08/31/16	0.8	12	12	28.0	23.3	0
BBC_MH3A	05/31/17	08/16/17	0.1	5	4	25.0	23.5	0
BBC_MH3A	06/07/17	09/12/17	0.7	12	12	24.0	21.1	0
BBC_MH3A	06/20/18	09/19/18	0.1	6	5	25.6	24.0	0
BBC_MH3A	06/05/18	09/15/18	0.6	9	9	27.2	23.8	0
BBC_MH3A	06/10/19	07/11/19	0.2	2	2	25.0	23.0	0
BBC_MH3A	06/04/19	09/10/19	0.7	10	10	24.0	20.7	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)
Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_MH3	2015	0.2	4	0.33	0.50	0.40	4	3.91	8.98	5.96	2	0
BBC_MH3	2016	0.2	4	0.37	0.48	0.44	4	2.54	3.82	3.39	4	0
BBC_MH3	2017	0.2	1	0.56	0.56	0.56	1	2.81	2.81	2.81	1	0
BBC_MH3	2018	0.2	3	0.36	0.54	0.45	3	2.30	3.08	2.69	3	0
BBC_MH3	2019	0.2	3	0.40	1.20	0.79	3	0.87	7.42	3.22	2	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_MH3A	2019	0.2	1	0.56	0.56	0.56	1	7.06	7.06	7.06	0	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_MH3	07/01/15	09/14/15	7	1.0	1.7	1.4
BBC_MH3	06/22/16	08/01/16	4	0.8	1.6	1.2
BBC_MH3	07/06/17	09/20/17	3	0.3	2.0	1.3
BBC_MH3	06/05/18	08/21/18	3	1.1	1.5	1.4
BBC_MH3	06/14/19	08/15/19	3	0.3	1.0	0.6
BBC_MH3A	06/06/16	08/20/16	3	0.9	1.4	1.2
BBC_MH3A	06/07/17	08/08/17	3	0.8	0.9	0.9
BBC_MH3A	08/11/18	09/11/18	2	0.8	1.1	0.9
BBC_MH3A	06/04/19	09/10/19	4	1.0	1.2	1.1

Toxics and other pollutants (metals, ammonia, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_MH3	07/13/15	08/25/15	0.2	4	0.024	0.039	0.031
BBC_MH3	07/05/16	08/15/16	0.2	4	0.006	0.035	0.021
BBC_MH3	07/06/17	07/06/17	0.2	1	0.051	0.051	0.051
BBC_MH3	07/24/18	08/21/18	0.2	3	0.010	0.077	0.039
BBC_MH3	07/25/19	08/15/19	0.2	3	0.008	0.031	0.023
BBC_MH3A	07/11/19	07/11/19	0.2	1	0.027	0.027	0.027

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Mattapoisett River AU (MA95-60); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	

Mattapoissett River (MA95-60): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.041 sq mi (93%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.041 sq mi (93%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB26.0	Mattapoissett River	Prohibited	0.04097	93.3%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Mattapoissett River (MA95-60) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for this Mattapoissett River AU (MA95-60) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Mattapoissett River (MA95-60): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.041 sq mi (93%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for this Mattapoissett River AU (MA95-60) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Mattapoissett River (MA95-60): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.041 sq mi (93%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than "approved", the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Megansett Harbor (MA95-19)

Location:	From the outlet of Squeteague Harbor, Falmouth to Buzzards Bay at a line from the western tip of Scraggy Neck, Bourne south to the tip of Nyes Neck, Falmouth.
AU Type:	ESTUARY
AU Size:	1.44 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Estuarine Bioassessments	R1_MA_2020_07	Changed
5	5	Fecal Coliform		Unchanged
5	5	Nutrient/Eutrophication Biological Indicators	R1_MA_2020_07	Changed

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)	X					

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Estuarine Bioassessments	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Nitrogen TMDL Report for Megansett-Squeteague Harbor Estuarine System (Report CN 452.1, approved 2020-06-18, ATTAINS Action ID: R1_MA_2020_07)
Nutrient/Eutrophication Biological Indicators	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Nitrogen TMDL Report for Megansett-Squeteague Harbor Estuarine System (Report CN 452.1, approved 2020-06-18, ATTAINS Action ID: R1_MA_2020_07)

Recommendations

2022 Recommendations
ALU: Conduct additional monitoring for nutrient enrichment indicators on summer ebb tides for the Megansett Harbor AU (MA95-19). Be sure to get at least three samples per year for total nitrogen so seasonal averages can be calculated as per CALM requirements. Continue to monitor eelgrass bed habitat for evidence of improvement/growth.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>The MassDEP Eelgrass Mapping Project documented an ~42% loss of eelgrass bed habitat in Megansett Harbor between 1995 and 2017. It should be noted that the eelgrass loss was along the deeper water outer edges, which is indicative of nitrogen enrichment. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at five locations in Megansett Harbor, Bourne/Falmouth (MA95-19) in the summers of 2015-2019, from inner to outer as follows: close to the southern shore at the inside end of the harbor (BBC_MG1X and MG1N), open waters (BBC_MG2), close to southern shore (BBC_MG3), and close to northern shore (BBC_MG4). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at BBC_MG1X and MG3 (at depths ranging 1.8-2.2m) and was usually conducted weekly (between the hours of 6 and 9am. The maximum temperature was 28.5°C (n=314). The minimum dissolved oxygen (DO) was 4.5mg/L (n=251); <6.0mg/L 40 times (~16% of all measurements) and <5.0mg/L five times (~2% of all measurements). The excursions from the 6.0mg/L criterion occurred most frequently at the inside end of the harbor (BBC_MG1X) at both surface and depth, although no measurements <6.0mg/L were recorded in 2019. Total nitrogen sampling (n=35, maximum 0.53mg/L) during ebb tides between June and September documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.27 and 0.41mg/L. The maximum Chlorophyll <i>a</i> was 13.24µg/L (n=96), >5µg/L 16 times but >10µg/L just once. Secchi disk depth measurements in summers 2015-2019 ranged from 1.3 to 4.3m (n=104). Ammonia-nitrogen concentrations were low (range 0.004 to 0.04mg/L, n=96), but TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for Megansett Harbor (MA95-19) will continue to be assessed as Not Supporting based primarily on the loss of eelgrass bed habitat documented by the MassDEP between 1995 and 2017. The Estuarine Bioassessments and Nutrient/Eutrophication Biological Indicators impairments are being carried forward.</p>	

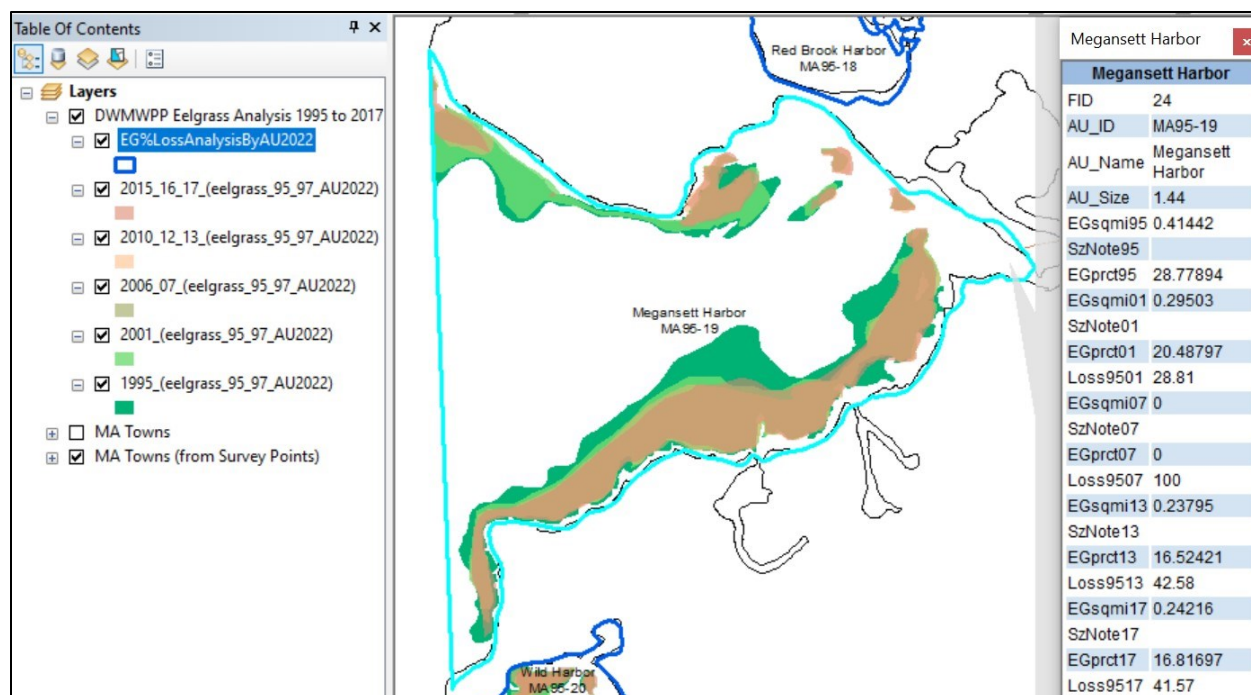
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_MG1N	Buzzards Bay Coalition	Water Quality	Megansett Harbor	Megansett Harbor, Falmouth	41.656801	-70.623834
BBC_MG1X	Buzzards Bay Coalition	Water Quality	Megansett Harbor	Megansett Harbor, Falmouth	41.656435	-70.623837
BBC_MG2	Buzzards Bay Coalition	Water Quality	Megansett Harbor	Megansett Harbor, Bourne	41.658968	-70.632234
BBC_MG3	Buzzards Bay Coalition	Water Quality	Megansett Harbor	Megansett Harbor, Falmouth	41.650247	-70.635919
BBC_MG4	Buzzards Bay Coalition	Water Quality	Megansett Harbor	Megansett Harbor, Bourne/Falmouth	41.658751	-70.643036

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Megansett Harbor MA95-19 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~42% loss of eelgrass bed habitat in Megansett Harbor between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_MG1X	05/30/15	09/23/15	0.2	21	4.5	6.3	29	5	0
BBC_MG1X	05/30/15	09/23/15	1.9	21	4.5	6.2	24	10	0
BBC_MG1X	03/08/16	09/26/16	0.2	28	5.5	7.2	25	0	0
BBC_MG1X	05/31/16	09/26/16	2.1	26	5.6	7.0	19	0	0
BBC_MG1X	01/09/17	09/19/17	0.2	29	4.7	7.6	10	3	0
BBC_MG1X	06/01/17	09/15/17	2.1	22	5.8	7.5	5	0	0
BBC_MG1X	05/30/18	09/19/18	0.2	22	4.5	6.6	27	5	0
BBC_MG1X	05/30/18	09/19/18	2.0	23	5.5	6.5	22	0	0
BBC_MG1X	05/30/19	09/23/19	0.2	22	6.5	7.5	0	0	0
BBC_MG1X	05/30/19	09/23/19	2.1	22	6.0	7.5	0	0	0
BBC_MG2	08/03/17	08/03/17	0.2	1	6.7	6.7	0	0	0
BBC_MG3	06/16/15	09/24/15	0.2	4	5.8	7.0	25	0	0
BBC_MG3	06/01/16	09/26/16	0.2	4	5.0	7.2	25	0	0
BBC_MG3	01/09/17	09/18/17	0.2	5	7.3	8.6	0	0	0
BBC_MG4	08/03/17	08/03/17	0.2	1	7.0	7.0	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_MG1N	07/27/15	08/25/15	0.2	3	3	27.0	25.7	0
BBC_MG1N	07/05/16	08/15/16	0.2	4	4	28.5	26.5	0
BBC_MG1N	08/17/17	08/17/17	0.2	1	1	23.7	23.7	0
BBC_MG1N	07/10/18	08/21/18	0.2	3	3	26.0	23.4	0
BBC_MG1N	07/25/19	08/15/19	0.2	3	3	25.0	24.7	0
BBC_MG1X	05/30/15	09/24/15	0.2	24	20	27.5	23.6	0
BBC_MG1X	05/30/15	09/23/15	2.0	20	17	28.0	24.1	0
BBC_MG1X	01/06/16	09/26/16	0.2	29	21	27.0	23.2	0
BBC_MG1X	05/31/16	09/26/16	2.2	25	19	27.5	23.7	0
BBC_MG1X	01/09/17	09/19/17	0.2	29	26	26.4	21.5	0
BBC_MG1X	06/01/17	09/15/17	2.1	22	22	25.1	21.6	0
BBC_MG1X	05/30/18	09/19/18	0.2	22	20	27.0	23.1	0
BBC_MG1X	05/30/18	09/19/18	2.0	22	20	27.0	23.3	0
BBC_MG1X	05/30/19	09/23/19	0.2	22	19	26.5	22.8	0
BBC_MG1X	05/30/19	09/23/19	2.2	22	19	26.0	22.8	0
BBC_MG2	07/27/15	08/25/15	0.2	3	3	27.0	25.8	0
BBC_MG2	07/05/16	08/15/16	0.2	4	4	28.0	26.5	0
BBC_MG2	08/03/17	08/17/17	0.2	2	2	24.2	24.0	0
BBC_MG2	07/10/18	08/21/18	0.2	3	3	27.0	23.7	0
BBC_MG2	07/25/19	08/15/19	0.2	3	3	25.0	24.7	0
BBC_MG3	06/16/15	09/24/15	0.2	7	6	27.0	23.4	0
BBC_MG3	07/27/15	08/25/15	1.8	3	3	27.0	24.7	0
BBC_MG3	01/06/16	09/26/16	0.2	9	6	27.0	23.4	0
BBC_MG3	07/18/16	08/15/16	2.2	3	3	28.0	27.0	0
BBC_MG3	01/09/17	09/18/17	0.2	6	3	23.5	20.7	0
BBC_MG3	07/10/18	08/21/18	0.2	3	3	26.0	23.7	0
BBC_MG3	07/25/19	08/15/19	0.2	3	3	25.0	24.7	0
BBC_MG4	07/27/15	08/25/15	0.2	3	3	27.0	25.5	0
BBC_MG4	07/18/16	08/15/16	0.2	3	3	28.0	26.7	0
BBC_MG4	08/03/17	08/17/17	0.2	2	2	23.5	23.5	0
BBC_MG4	07/10/18	08/21/18	0.2	3	3	26.0	23.6	0
BBC_MG4	07/25/19	08/15/19	0.2	3	3	25.0	24.0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_MG1N	2015	0.2	3	0.28	0.41	0.36	3	3.21	8.91	6.88	1	0
BBC_MG1N	2016	0.2	2	0.36	0.40	0.38	4	2.32	5.48	4.02	3	0
BBC_MG1N	2017	0.2	1	0.45	0.45	0.45	1	4.76	4.76	4.76	1	0
BBC_MG1N	2018	0.2	1	0.47	0.47	0.47	4	1.69	5.13	3.81	3	0
BBC_MG1N	2019	0.2	1	0.35	0.35	0.35	3	0.56	5.26	3.35	2	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_MG1X	2015	0.2	2	0.29	0.50	0.40	4	4.23	7.42	5.35	3	0
BBC_MG1X	2016	0.2	3	0.33	0.38	0.36	6	0.47	4.06	2.26	6	0
BBC_MG1X	2017	0.2	5	0.28	0.53	0.41	8	0.53	6.10	3.15	7	0
BBC_MG2	2015	0.2	2	0.22	0.30	0.26	3	3.51	4.81	4.27	3	0
BBC_MG2	2016	0.2	--	--	--	--	4	1.25	6.54	3.72	3	0
BBC_MG2	2017	0.2	--	--	--	--	2	3.76	4.21	3.99	2	0
BBC_MG2	2018	0.2	--	--	--	--	3	1.70	5.07	3.16	2	0
BBC_MG2	2019	0.2	--	--	--	--	3	3.44	5.11	4.07	2	0
BBC_MG3	2015	0.2	5	0.19	0.35	0.27	6	3.07	5.99	4.21	4	0
BBC_MG3	2015	1.8	2	0.24	0.43	0.33	3	3.80	13.24	7.96	1	1
BBC_MG3	2016	0.2	2	0.25	0.33	0.29	9	0.68	4.26	1.79	9	0
BBC_MG3	2016	2.1	2	0.25	0.35	0.30	3	1.25	3.42	2.04	3	0
BBC_MG3	2017	0.2	--	--	--	--	6	2.23	3.56	2.89	6	0
BBC_MG3	2018	0.2	--	--	--	--	3	1.90	3.99	3.03	3	0
BBC_MG3	2019	0.2	--	--	--	--	3	4.64	5.72	5.02	2	0
BBC_MG4	2015	0.2	2	0.19	0.32	0.26	3	3.00	5.25	4.38	2	0
BBC_MG4	2016	0.2	1	0.21	0.21	0.21	3	2.03	4.82	3.15	3	0
BBC_MG4	2017	0.2	--	--	--	--	2	2.05	3.62	2.84	2	0
BBC_MG4	2018	0.2	1	0.33	0.33	0.33	4	1.89	5.00	3.24	4	0
BBC_MG4	2019	0.2	--	--	--	--	3	2.81	4.10	3.50	3	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_MG1N	07/27/15	08/25/15	3	2.1	2.4	2.2
BBC_MG1N	07/05/16	08/15/16	4	1.3	2.4	2.0
BBC_MG1N	08/17/17	08/17/17	1	2.2	2.2	2.2
BBC_MG1N	07/10/18	08/21/18	4	1.6	3.1	2.3
BBC_MG1N	07/25/19	08/15/19	3	1.9	2.5	2.3
BBC_MG1X	05/30/15	09/15/15	14	1.3	2.5	1.9
BBC_MG1X	06/16/16	09/18/16	10	1.4	2.8	2.3
BBC_MG1X	06/07/17	09/08/17	13	1.8	2.8	2.1
BBC_MG1X	05/30/18	09/19/18	9	2.0	2.8	2.3
BBC_MG1X	06/04/19	09/18/19	9	1.8	2.9	2.3
BBC_MG2	07/27/15	08/25/15	3	2.2	3.5	2.9
BBC_MG2	07/18/16	08/15/16	3	1.9	2.3	2.0
BBC_MG3	06/16/15	09/24/15	4	2.6	3.4	3.0
BBC_MG3	06/01/16	09/12/16	5	1.8	4.3	3.3
BBC_MG3	01/09/17	09/18/17	3	1.6	2.7	2.1
BBC_MG3	07/10/18	08/07/18	2	2.2	2.4	2.3
BBC_MG3	07/25/19	08/15/19	3	2.1	2.8	2.5

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_MG4	07/27/15	08/25/15	3	2.1	3.4	2.6
BBC_MG4	08/01/16	08/15/16	2	2.5	2.8	2.7
BBC_MG4	08/17/17	08/17/17	1	3.4	3.4	3.4
BBC_MG4	07/10/18	08/21/18	3	2.3	2.6	2.4
BBC_MG4	08/08/19	08/15/19	2	2.2	2.7	2.5

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_MG1N	07/27/15	08/25/15	0.2	3	0.006	0.009	0.008
BBC_MG1N	07/05/16	08/15/16	0.2	4	0.005	0.010	0.008
BBC_MG1N	08/17/17	08/17/17	0.2	1	0.005	0.005	0.005
BBC_MG1N	07/10/18	08/21/18	0.2	4	0.004	0.007	0.005
BBC_MG1N	07/25/19	08/15/19	0.2	3	0.004	0.004	0.004
BBC_MG1X	06/16/15	09/24/15	0.2	4	0.004	0.039	0.016
BBC_MG1X	01/06/16	09/26/16	0.2	6	0.004	0.022	0.010
BBC_MG1X	01/09/17	09/19/17	0.2	8	0.004	0.030	0.011
BBC_MG2	07/27/15	08/25/15	0.2	3	0.009	0.015	0.012
BBC_MG2	07/05/16	08/15/16	0.2	4	0.004	0.008	0.006
BBC_MG2	08/03/17	08/17/17	0.2	2	0.004	0.006	0.005
BBC_MG2	07/10/18	08/21/18	0.2	3	0.004	0.004	0.004
BBC_MG2	07/25/19	08/15/19	0.2	3	0.004	0.004	0.004
BBC_MG3	06/16/15	09/24/15	0.2	6	0.004	0.029	0.011
BBC_MG3	07/27/15	08/25/15	1.8	3	0.007	0.033	0.017
BBC_MG3	01/06/16	09/26/16	0.2	9	0.004	0.008	0.006
BBC_MG3	07/18/16	08/15/16	2.2	3	0.004	0.019	0.010
BBC_MG3	01/09/17	09/18/17	0.2	6	0.004	0.005	0.004
BBC_MG3	07/10/18	08/21/18	0.2	3	0.004	0.004	0.004
BBC_MG3	07/25/19	08/15/19	0.2	3	0.004	0.004	0.004
BBC_MG4	07/27/15	08/25/15	0.2	3	0.006	0.013	0.009
BBC_MG4	07/18/16	08/15/16	0.2	3	0.004	0.006	0.005
BBC_MG4	08/03/17	08/17/17	0.2	2	0.004	0.005	0.004
BBC_MG4	07/10/18	08/21/18	0.2	4	0.004	0.004	0.004
BBC_MG4	07/25/19	08/15/19	0.2	3	0.004	0.004	0.004

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Megansett Harbor (MA95-19); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Megansett Harbor (MA95-19): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.4166 sq mi (98%). The approved shellfish growing area represents 1.3922 sq mi (97%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB28.0	North Buzzards Bay	Approved	0.00013	0.0%
BB50.0	Megansett Harbor	Approved	1.39203	96.6%
BB50.1	Fiddlers Cove	Conditionally Approved	0.00000	0.0%
BB50.2	Rands Canal	Conditionally Approved	0.00000	0.0%
BB50.3	Squeteague Harbor	Conditionally Approved	0.02440	1.7%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Megansett Harbor (MA95-19) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There are four beaches in Megansett Harbor, Bourne/Falmouth (MA95-19); the names and ID codes for the beaches are as follows: on the northern shore (Bourne), Scraggy Beach: South Causeway (ID 5708) and Scraggy Neck Recreation Association (ID 2944); then on the southern shore (Falmouth), Megansett Yacht Club (ID 5527) and Megansett (ID 2860). These beaches were never posted with advisories for swimming between 2014 and 2019. The Primary Contact Recreational Use for Megansett Harbor (MA95-19) is assessed as Fully Supporting since there no swimming advisory postings at the Scraggy Beach: South Causeway, Scraggy Neck Recreation Association, Megansett Yacht Club, or Megansett beaches between 2014 and 2019.	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2655	Scraggy Neck Recreation Association/Bourne	41.66148	-70.64780	41.66073	-70.64680	0%	0%	0%	0%	0%	0%	0
2860	Megansett/Falmouth	41.65498	-70.62470	41.65628	-70.62480	0%	0%	0%	0%	0%	0%	0
5527	Megansett Yacht Club/Falmouth	41.65608	-70.62330	41.65611	-70.62260	0%	0%	0%	0%	0%	0%	0
5708	Scraggy Beach: South Causeway/Bourne	41.66403	-70.63450	41.66298	-70.63100	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Megansett Harbor (MA95-19): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.4166 sq mi (98%). The approved shellfish growing area represents 1.3922 sq mi (97%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There are four beaches in Megansett Harbor, Bourne/Falmouth (MA95-19); the names and ID codes for the beaches are as follows: on the northern shore (Bourne), Scraggy Beach: South Causeway (ID 5708) and Scraggy Neck Recreation Association (ID 2944); then on the southern shore (Falmouth), Megansett Yacht Club (ID 5527) and Megansett (ID 2860). These beaches were never posted with advisories for swimming between 2014 and 2019. The Secondary Contact Recreational Use for Megansett Harbor (MA95-19) is assessed as Fully Supporting since there were no swimming advisory postings at the Scraggy Beach: South Causeway, Scraggy Neck Recreation Association, Megansett Yacht Club, or Megansett beaches between 2014 and 2019.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Megansett Harbor (MA95-19): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.4166 sq mi (98%). The approved shellfish growing area represents 1.3922 sq mi (97%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Micajah Pond (MA95102)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	20 ACRES
Classification/Qualifier:	B

No usable data were available for Micajah Pond (MA95102) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Mill Pond (MA95105)

Location:	Wareham.
AU Type:	FRESHWATER LAKE
AU Size:	149 ACRES
Classification/Qualifier:	B: WWF, HQW

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	5	(Fish Passage Barrier*)		Added
4c	5	(Non-Native Aquatic Plants*)		Unchanged
4c	5	Harmful Algal Blooms		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Impacts from Hydrostructure Flow Regulation/Modification (Y)	X				
(Non-Native Aquatic Plants*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
Harmful Algal Blooms	Source Unknown (N)			X	X	X

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, variable milfoil (<i>Myriophyllum heterophyllum</i>), in Mill Pond (MA95105) during a July 1995 synoptic survey. DMF biologists note one structure affecting the passage of diadromous fish between Mill Pond and the AU downstream (Agawam River MA95-28). The Mill Pond Dam (NATID# MA00027) (with existing Steeppass fishway), was given a passage score of "4", on a 0-10 scale, indicating that the dam restricts the passage of the targeted species, river herring and American eel. The population score was "6" in this area.</p> <p>The Aquatic Life Use for Mill Pond (MA95105) will continue to be assessed as Not Supporting with the Non-Native Aquatic Plants impairment (for <i>Myriophyllum heterophyllum</i>) being carried forward. An impairment for Fish Passage Barrier is being added based on the barrier to diadromous fish passage at the Mill Pond Dam.</p>	

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary

DMF biologists note one structure at the downstream end of the Agawam River AU assisting the passage of diadromous fish between Mill Pond and the AU downstream (Agawam River MA95-28). The Mill Pond Dam (NATID# MA00027) (with existing Steeppass fishway), was given a passage score of "4", on a 0-10 scale, indicating that the dam restricts the passage of the targeted species, river herring and American eel. The population score was noted to be "6" in this area. The Aquatic Life Use for Mill Pond (Assessment Unit MA95105) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Mill Pond Dam.

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995)

Summary Statement

As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, variable milfoil (*Myriophyllum heterophyllum*), in Mill Pond during a July 1995 synoptic survey.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Mill Pond (MA95105); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
C-HAB postings for Mill Pond (MA95105) were reported to MassDPH for 23 days in 2018. The Aesthetics Use for Mill Pond (MA95105) is assessed as Not Supporting since harmful algal blooms >20 days in duration were reported in a recent year.	

Algal Bloom Information

Cyanobacteria Harmful Algal Bloom (C-HAB) Summary Statements for 2015-2019 MassDPH Data (Bailey, Logan April 15, 2021) (MassDEP Undated4)

C-HAB Summary Statement

C-HAB postings for Mill Pond (MA95105) were reported to MassDPH for 23 days in 2018. Since blooms >20 days in duration were reported in a recent year, the Primary/Secondary Contact Recreational Uses and Aesthetics Use are assessed as Not Supporting.

Cyanobacteria Harmful Algal Bloom (C-HAB) Data (2015-2019) Provided by MassDPH (Bailey, Logan April 15, 2021)

Waterbody	Sample Analysis Used in Issuing Advisory	Bloom Days, 2015	Bloom Days, 2016	Bloom Days, 2017	Bloom Days, 2018	Bloom Days, 2019	# Years with >20 Days of Closure	>1 Posting Per Year
Mill Pond	Not issued or confirmed by sampling				23		1	no

Primary Contact Recreation

2022 Use Attainment		Alert
Not Supporting		NO
2022 Use Attainment Summary		
C-HAB postings for Mill Pond (MA95105) were reported to MADPH for 23 days in 2018. The Primary Contact Recreational Use for Mill Pond (MA95105) is assessed as Not Supporting since harmful algal blooms >20 days in duration were reported in a recent year.		

Secondary Contact Recreation

2022 Use Attainment		Alert
Not Supporting		NO
2022 Use Attainment Summary		
C-HAB postings for Mill Pond (MA95105) were reported to MassDPH for 23 days in 2018. The Secondary Contact Recreational Use for Mill Pond (MA95105) is assessed as Not Supporting since harmful algal blooms >20 days in duration were reported in a recent year.		

Nasketucket Bay (MA95-65)

Location:	From the confluence with Little Bay, Fairhaven to Buzzards Bay along Causeway Road, Fairhaven (on the south) and along a line from the southern tip of Brant Island, Mattapoisett to the eastern tip of West Island, Fairhaven (includes Shaws Cove and Round Cove).
AU Type:	ESTUARY
AU Size:	3.69 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	5	Estuarine Bioassessments		Added
4a	5	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an ~31% loss of eelgrass bed habitat in Nasketucket Bay between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in Nasketucket Bay, Fairhaven (MA95-65) in the summers of 2015-2019 as follows; from the Town boat launch in the north-west corner of the AU (BBC_LT0), offshore in the north-west corner (BBC_LT4), and from a dock in “West Island marina” on Long Island (BBC_WI1). Monitoring was conducted in the surface waters at all three locations, as well as at depths ranging from 0.8m at BBC_LT0 to 2m at BBC_LT4, and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 28.0°C (n=301). The minimum DO was 4.0mg/L (n=149, most measurements taken at BBC_LT0) and was <6.0mg/L 41 times (28% of the measurements overall), excursions were rarely severe (<5.0mg/L only twice) and the yearly averages ranged from 5.9-7.4mg/L. Excursions from the DO criteria occurred most often at BBC_LT0 (at the surface and at depths ranging 0.2-1m) and though these low concentrations are of concern, this BBC monitoring location is not representative of the water quality conditions of the greater extent of the AU. Nutrient sampling efforts (ebb tides in May – September at BBC_WI1 and LT4 n=19, maximum of 0.50mg/L at BBC_WI1 in 2017) documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.3-0.37mg/L at BBC_WI1 in 2015, 2017, and 2018. The Chlorophyll *a* maximum (data only at BBC_LT4 and WI1) was 6.96µg/L (n=43), >5µg/L five times, and Secchi disk depth ranged from 0.6-3.0m at the three sample locations. Ammonia-nitrogen concentrations were generally low (range 0.004 to 0.08mg/L (n=43)), though TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for Nasketucket Bay (MA95-65) is being assessed as Not Supporting based on the loss of eelgrass bed habitat documented by the MassDEP Eelgrass Mapping Project between 1995 and 2017 so an Estuarine Bioassessment impairment is being added.

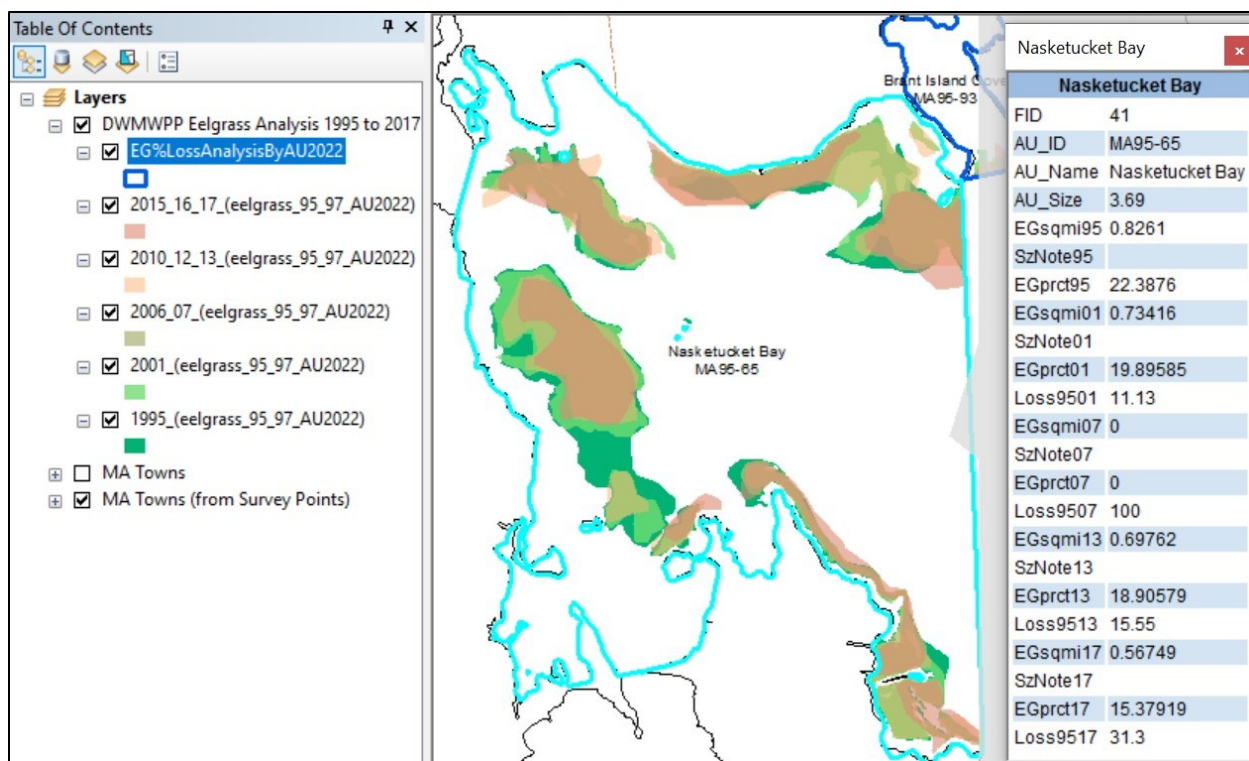
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_LT0	Buzzards Bay Coalition	Water Quality	Little Bay	Little Bay, Fairhaven	41.620227	-70.854916
BBC_LT4	Buzzards Bay Coalition	Water Quality	Little Bay	Little Bay, Fairhaven	41.621025	-70.848986
BBC_WI1	Buzzards Bay Coalition	Water Quality	Nasketucket Bay	Nasketucket Bay, Fairhaven	41.597114	-70.843447

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Nasketucket Bay MA95-65 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~31% loss of eelgrass bed habitat in Nasketucket Bay between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_LT0	06/05/15	09/18/15	0.2	14	5.6	6.4	36	0	0
BBC_LT0	06/05/15	09/18/15	1.0	14	5.1	6.3	43	0	0
BBC_LT0	06/05/16	09/17/16	0.2	9	6.0	7.0	0	0	0
BBC_LT0	06/05/16	09/24/16	0.9	21	4.0	6.5	29	5	0
BBC_LT0	06/07/17	09/06/17	0.2	5	5.5	5.9	60	0	0
BBC_LT0	06/03/17	09/25/17	0.8	21	5.0	5.9	48	0	0
BBC_LT0	06/10/18	09/11/18	0.2	6	5.0	6.1	17	0	0
BBC_LT0	06/10/18	09/19/18	0.8	19	4.5	6.0	32	5	0
BBC_LT0	05/30/19	09/13/19	0.2	9	6.0	7.4	0	0	0
BBC_LT0	05/30/19	09/23/19	0.9	22	5.5	7.3	5	0	0
BBC_LT4	07/13/15	08/25/15	0.2	4	6.0	6.2	0	0	0
BBC_LT4	07/13/15	08/25/15	2.0	4	5.9	6.2	25	0	0
BBC_LT4	07/18/16	07/18/16	0.2	1	7.0	7.0	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_LT0	06/05/15	09/18/15	0.2	14	13	26.3	23.2	0
BBC_LT0	06/05/15	09/18/15	1.0	14	13	26.2	23.2	0
BBC_LT0	06/05/16	09/17/16	0.2	9	8	27.5	23.6	0
BBC_LT0	06/05/16	09/24/16	0.9	21	18	27.0	23.2	0
BBC_LT0	06/07/17	09/06/17	0.2	5	5	24.7	20.7	0
BBC_LT0	06/03/17	09/25/17	0.8	21	19	24.3	20.0	0
BBC_LT0	06/10/18	09/11/18	0.2	6	6	26.0	22.3	0
BBC_LT0	06/10/18	09/19/18	0.8	19	18	26.0	23.3	0
BBC_LT0	05/30/19	09/13/19	0.2	9	8	24.5	21.9	0
BBC_LT0	05/30/19	09/23/19	0.9	22	19	25.0	22.3	0
BBC_LT4	07/13/15	08/25/15	0.2	4	4	26.2	24.5	0
BBC_LT4	07/13/15	08/25/15	2.0	4	4	26.1	24.4	0
BBC_LT4	07/18/16	08/15/16	0.2	2	2	27.0	26.1	0
BBC_LT4	07/06/17	07/06/17	0.2	1	1	24.1	24.1	0
BBC_LT4	07/10/18	08/07/18	0.2	2	2	26.7	24.9	0
BBC_WI1	06/05/15	09/24/15	0.2	22	20	25.5	22.4	0
BBC_WI1	06/05/15	09/24/15	1.7	18	16	25.5	22.1	0
BBC_WI1	01/06/16	09/26/16	0.2	25	21	28.0	23.5	0
BBC_WI1	06/07/16	09/25/16	1.8	15	14	27.0	23.6	0
BBC_WI1	03/08/17	09/19/17	0.2	19	17	24.7	20.3	0
BBC_WI1	06/13/17	09/13/17	1.7	9	9	22.0	20.4	0
BBC_WI1	05/31/18	09/19/18	0.2	15	13	26.7	23.0	0
BBC_WI1	05/31/18	09/19/18	1.6	12	10	25.2	22.0	0
BBC_WI1	05/30/19	09/23/19	0.2	25	22	25.0	22.1	0
BBC_WI1	05/30/19	09/23/19	1.7	22	19	25.0	21.7	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_LT4	2015	0.2	2	0.24	0.29	0.27	4	2.51	6.86	4.48	2	0
BBC_LT4	2016	0.2	--	--	--	--	2	1.05	2.92	1.99	2	0
BBC_LT4	2017	0.2	--	--	--	--	1	2.77	2.77	2.77	1	0
BBC_LT4	2018	0.2	1	0.35	0.35	0.35	2	2.59	2.84	2.72	2	0
BBC_WI1	2015	0.2	5	0.26	0.41	0.31	8	1.68	5.66	4.10	6	0
BBC_WI1	2016	0.2	2	0.31	0.32	0.32	10	0.92	3.67	2.18	10	0
BBC_WI1	2017	0.2	5	0.27	0.50	0.37	10	1.34	4.18	3.06	10	0
BBC_WI1	2018	0.2	3	0.23	0.36	0.30	3	2.48	2.78	2.64	3	0
BBC_WI1	2019	0.2	1	0.38	0.38	0.38	3	2.61	6.96	4.39	2	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_LT0	06/05/16	09/07/16	2	0.8	1.8	1.3
BBC_LT0	08/11/18	09/11/18	2	0.6	1.1	0.9
BBC_LT0	06/14/19	08/29/19	4	1.1	1.7	1.4
BBC_LT4	07/13/15	08/25/15	3	1.7	2.2	1.9
BBC_LT4	07/18/16	07/18/16	1	3.0	3.0	3.0
BBC_LT4	07/06/17	07/06/17	1	1.6	1.6	1.6
BBC_LT4	07/10/18	08/07/18	2	1.2	1.3	1.2
BBC_WI1	06/16/15	09/22/15	9	1.4	2.2	1.9
BBC_WI1	06/07/16	08/31/16	10	1.5	2.5	1.9
BBC_WI1	06/06/17	08/08/17	4	1.8	2.3	2.0
BBC_WI1	06/04/18	09/11/18	4	1.6	1.8	1.7
BBC_WI1	05/30/19	09/14/19	11	1.5	2.3	1.9

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_LT4	07/13/15	08/25/15	0.2	4	0.007	0.013	0.009
BBC_LT4	07/18/16	08/15/16	0.2	2	0.004	0.006	0.005
BBC_LT4	07/06/17	07/06/17	0.2	1	0.004	0.004	0.004
BBC_LT4	07/10/18	08/07/18	0.2	2	0.004	0.005	0.004
BBC_WI1	06/16/15	09/24/15	0.2	8	0.005	0.075	0.024
BBC_WI1	01/06/16	09/26/16	0.2	10	0.004	0.022	0.011
BBC_WI1	01/09/17	09/19/17	0.2	10	0.004	0.019	0.011
BBC_WI1	07/24/18	08/21/18	0.2	3	0.008	0.026	0.015
BBC_WI1	07/11/19	08/15/19	0.2	3	0.004	0.007	0.005

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Nasketucket Bay (MA95-65); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

Nasketucket Bay (MA95-65): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 3.6492 sq mi (99%). The approved shellfish growing area represents 3.4358 sq mi (93%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is <100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB17.1	West Island South East	Prohibited	0.00002	0.0%
BB18.0	West Island North	Approved	0.42653	11.6%
BB18.1	Earls Marina	Prohibited	0.02836	0.8%
BB18.4	West Island North Mooring Area	Conditionally Approved	0.08548	2.3%
BB18.5	Bella Vista Cove	Approved	0.02556	0.7%
BB19.0	West Island East Coastal	Approved	0.48505	13.2%
BB20.0	Fairhaven East Coastal	Approved	0.27958	7.6%
BB21.0	Nasketucket Bay	Approved	2.17017	58.8%
BB21.20	North Cove	Approved	0.04894	1.3%
BB21.6	Howards Creek	Prohibited	0.00008	0.0%
BB21.7	Black Duck Creek	Prohibited	0.00010	0.0%
BB21.8	Seaview Avenue Boat Ramp	Prohibited	0.00003	0.0%
BB22.3	Little Bay	Conditionally Approved	0.09928	2.7%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Nasketucket Bay (MA95-65) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There are five beaches in Nasketucket Bay (MA95-65), three in Fairhaven and two in Mattapoisett; the names and ID codes for the beaches are as follows: West Island Town (ID 2815), West Island Causeway (ID 2816), Seaview (ID 2818), Brant Beach (ID 2970), and Leisure Shores (ID 2976). These beaches were usually never (or only rarely) posted for swimming between 2014 and 2019, with the greatest number of posts occurring at Leisure Shores Beach in 2014 (9% of the bathing season posted). The Primary Contact Recreational Use for Nasketucket Bay (MA95-65) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the West Island Town, West Island Causeway, Seaview, Brant Beach, and Leisure Shores Beaches between 2014 and 2019.	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2815	West Island Town Beach/Fairhaven	41.58357	-70.82730	41.59137	-70.82040	0%	0%	0%	0%	0%	0%	0
2816	West Island Causeway/Fairhaven	41.59685	-70.83910	41.59716	-70.83810	0%	0%	0%	0%	0%	1%	0
2818	Seaview/Fairhaven	41.62084	-70.85570	41.61996	-70.85540	0%	0%	0%	0%	0%	0%	0
2970	Brant Beach/Mattapoisett	41.62463	-70.83250	41.62505	-70.83140	0%	0%	0%	0%	0%	0%	0
2976	Leisure Shores/Mattapoisett	41.62857	-70.82440	41.62856	-70.82180	9%	0%	1%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Nasketucket Bay (MA95-65): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 3.6492 sq mi (99%). The approved shellfish growing area represents 3.4358 sq mi (93%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There are five beaches in Nasketucket Bay, three in Fairhaven and two in Mattapoisett (MA95-65); the names and ID codes for the beaches are as follows: West Island Town (ID 2815), West Island Causeway (ID 2816), Seaview (ID 2818), Brant Beach (ID 2970), and Leisure Shores (ID 2976). These beaches were usually never (or only rarely) posted for swimming between 2014 and 2019, with the greatest number of posts occurring at Leisure Shores Beach in 2014 (9% of the bathing season posted). The Secondary Contact Recreational Use for Nasketucket Bay (MA61-07) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the West Island Town, West Island Causeway, Seaview, Brant Beach, and Leisure Shores Beaches between 2014 and 2019.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

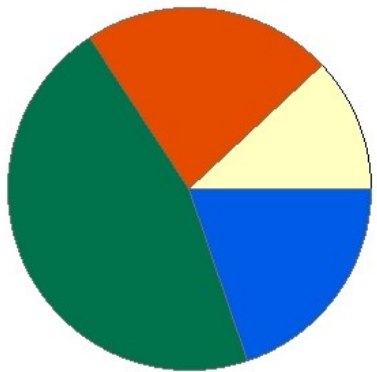
Summary
Nasketucket Bay (MA95-65): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 3.6492 sq mi (99%). The approved shellfish growing area represents 3.4358 sq mi (93%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Nasketucket River (MA95-104)

Location:	Headwaters, north of Meadow Lane, Fairhaven to the boundary of the saltwater wetland south of Route 6, Fairhaven.
AU Type:	RIVER
AU Size:	0.6 MILES
Classification/Qualifier:	B

Nasketucket River - MA95-104

Watershed Area: 2.26 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.26	2.26	0.68	0.68
Agriculture	12%	12%	13.3%	13.3%
Developed	22.3%	22.3%	19.3%	19.3%
Natural	45.9%	45.9%	42.8%	42.8%
Wetland	19.9%	19.9%	24.6%	24.6%
Impervious Cover	9%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	5	(Fish Passage Barrier*)		Added
--	5	Dissolved Oxygen		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Impacts from Hydrostructure Flow Regulation/Modification (Y)	X				
Dissolved Oxygen	Source Unknown (N)	X				

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO

2022 Use Attainment Summary

DMF biologists note one structure causing passage limitation to diadromous fish in the middle of this Nasketucket River AU, off Prince Street in Fairhaven. The Water Department Dam (NATID# MA03039) was given a passage score of "10", on a 0-10 scale, indicating that the dam allows no possible passage of the targeted species, river herring and American eel, with a population score of "1". DMF biologists also noted during a 2014 site visit that the dam had failed and although herring have been observed moving into the upstream pond, there are multiple dams upstream. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring in the Nasketucket River at one location in the summers of 2015-2019, at Huttleston Ave (Rt.6) (BBC_NR2). Monitoring was conducted in the surface waters, as well as deeper in the water column (depth of ~0.4m) and was usually conducted weekly (between 6 & 9am). The maximum temperature was 24°C (n=44); the minimum dissolved oxygen (DO) was 1.9mg/L (n=35), measuring <5.0mg/L in 10 of 35 measurements (~29%) twice between May and July (when anadromous fish early life stages are potentially present) and twice <4.0mg/L (in 2016 only). Nutrient sampling efforts in July and August (n=18, maximum 0.076mg/L) documented low seasonal average total phosphorus concentrations (0.019-0.032mg/L). The maximum chlorophyll *a* concentration was 99.8µg/L (n=16), >16µg/L just once in 2017. Ammonia-nitrogen concentrations were generally low (range 0.012 to 0.1mg/L (n=17)), though TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for this Nasketucket River AU (MA95-104) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Water Department Dam and the low DO documented at Huttleston Ave in the summers of 2015-2019 by BBC staff/volunteers. Impairments for Fish Passage Barrier and Dissolved Oxygen are being added. It is being noted here however that the drainage area of this river is extremely small (only 2.26mi²) but given the development (and impervious cover) and the dams, the low DO cannot be considered natural.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_NR2	Buzzards Bay Coalition	Water Quality	Nasketucket River	Nasketucket River Fresh, Fairhaven	41.642827	-70.871864

*Biological Monitoring Information**Habitat and Flow Data (anthropogenic alterations)***MassDMF Status of Priority Diadromous Fish Passage Barriers.** (Chase 2020)

Assessment Summary
DMF biologists note one structure causing passage limitation to diadromous fish in the middle of this Nasketucket River AU, off Prince Street in Fairhaven. The Water Department Dam (NATID# MA03039) was given a passage score of "10", on a 0-10 scale, indicating that the dam allows no possible passage of the targeted species, river herring and American eel, with a population score of "1". DMF biologists also noted during a 2014 site visit that the dam had failed and although herring have been observed moving into the upstream pond, there are multiple dams upstream. The Aquatic Life Use for Nasketucket River (Assessment Unit MA95-104) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Water Department Dam.

*Physico-chemical Water Quality Information**DO, pH, Temperature***Buzzards Bay Coalition Freshwater Discrete Dissolved Oxygen Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Average Sample depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
BBC_NR2	08/25/15	09/23/15	0.1	2	4.4	6.2	1	0	0
BBC_NR2	06/22/16	08/26/16	0.2	9	3.0	4.8	5	1	1
BBC_NR2	06/22/16	08/31/16	0.3	3	1.9	4.2	1	0	1
BBC_NR2	08/02/17	09/21/17	0.1	3	5.4	5.5	0	0	0
BBC_NR2	08/02/17	08/02/17	0.4	1	4.9	4.9	1	0	0
BBC_NR2	05/31/19	09/24/19	0.2	15	4.6	5.8	2	1	0
BBC_NR2	06/25/19	07/01/19	0.3	2	5.6	5.8	0	0	0

Buzzards Bay Coalition Discrete Freshwater Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_NR2	07/13/15	09/23/15	0.1	5	4	22.8	20.2	2	1	0	0
BBC_NR2	06/22/16	08/26/16	0.2	12	12	24.0	20.2	5	2	0	0
BBC_NR2	06/22/16	08/31/16	0.3	3	3	20.6	20.2	1	0	0	0
BBC_NR2	07/06/17	09/21/17	0.1	5	4	20.5	19.2	2	0	0	0
BBC_NR2	08/02/17	08/02/17	0.4	1	1	20.2	20.2	1	0	0	0
BBC_NR2	07/10/18	08/07/18	0.2	3	3	24.0	22.3	3	1	0	0
BBC_NR2	05/31/19	09/24/19	0.2	18	15	22.7	19.6	6	1	0	0
BBC_NR2	06/25/19	07/01/19	0.3	2	2	19.2	19.0	0	0	0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)
Buzzards Bay Coalition Freshwater Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	DO Sat Max (%)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count >16µg/L
BBC_NR2	2015	0.2	4	0.008	0.043	0.031	--	3	0.56	1.89	1.24	0
BBC_NR2	2016	0.2	4	0.015	0.022	0.019	--	4	1.17	4.01	2.74	0
BBC_NR2	2017	0.1	3	0.011	0.034	0.021	--	3	2.19	99.80	38.46	1
BBC_NR2	2018	0.2	4	0.010	0.076	0.031	--	3	0.66	10.13	4.36	0
BBC_NR2	2019	0.2	3	0.022	0.044	0.032	--	3	0.72	11.15	5.30	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_NR2	07/01/19	07/01/19	1	0.5	0.5	0.5

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_NR2	07/13/15	08/25/15	0.1	4	0.027	0.100	0.059
BBC_NR2	07/05/16	08/15/16	0.2	4	0.026	0.040	0.035
BBC_NR2	07/06/17	08/17/17	0.1	3	0.012	0.044	0.028
BBC_NR2	07/24/18	08/21/18	0.2	3	0.020	0.030	0.026
BBC_NR2	07/11/19	08/15/19	0.2	3	0.026	0.038	0.032

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Nasketucket River (MA95-104); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Nasketucket River AU (MA95-104) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for this Nasketucket River AU (MA95-104) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E. coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for this Nasketucket River AU (MA95-104) so it is Not Assessed.	

Nasketucket River (MA95-67)

Location:	Estuarine portion, from the boundary of the salt water wetland south of Route 6, Fairhaven to the mouth at Little Bay, Fairhaven (includes connector to Little Bay on the east side of the river).
AU Type:	ESTUARY
AU Size:	0.03 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Nitrogen, Total		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Nitrogen, Total	Source Unknown (N)	X					

Recommendations

2022 Recommendations
ALU: Collect dissolved oxygen, chlorophylla <i>a</i> , and total nitrogen data in the lower section of the Nasketucket River AU (MA95-67) (downstream of Pierces Point) to better evaluate the nature and extent of nutrient enrichment and dissolved oxygen stressors.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at two locations in the upper section of this Nasketucket River, Fairhaven AU (MA95-67) in the summers of 2015-2019 as follows; at the upstream end of the AU at Rt.6 (BBC_NR3) and then a little further downstream at Pierces Point (BBC_NR1). Monitoring was conducted in the surface waters at both locations, as well as deeper in the water column at BBC_NR1 (depths ranging 0.6-1.1m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 29.0°C (n=111). The minimum dissolved oxygen (DO) measurement (nearly all monitoring done at BBC_NR1) was 1.1mg/L (n=109) and was <6.0mg/L 102 times (94% of the measurements) and <5.0mg/L 92 times (85% of the measurements). Nutrient sampling efforts (ebb tides in July and August n=26, maximum 1.51mg/L) documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.71-1.17mg/L. Chlorophyll *a* concentrations were >10µg/L usually at least once per year (~27% of the measurements overall) (n=26), with a maximum of 22.83µg/L in 2017 at BBC_NR1 and yearly averages ranging 4.34-13.66µg/L. The BBC measured Secchi disk depth at BBC_NR1 in 2015-2017, the readings ranged from 0.8-1.7m with yearly averages of 1.2-1.3m (n=9). Ammonia-nitrogen concentrations ranged from 0.004 to 0.14mg/L (n=26) but TUs for ammonia-nitrogen could not be calculated (lack of quality assured pH and salinity data). Though the low DO and high chlorophyll *a* concentrations are of concern, the BBC monitoring locations are not representative of the water quality conditions of the greater extent of the AU (i.e., none downstream of Pierces Point).

The Aquatic Life Use for this Nasketucket River AU (MA95-67) will continue to be assessed as Not Supporting with the Total Nitrogen impairment being carried forward. Based on the water quality data collected by the BBC staff/volunteers in the river at Rt.6 and Pierces Point in 2015-2019, Alerts are being identified for Dissolved Oxygen and intermittently high Chlorophyll *a* concentrations documented by the BBC staff/volunteers in the upper section the AU (i.e., upstream of Pierces Point). Recommendations will be made to collect additional DO and Chlorophyll *a* data in the lower section of the AU to better evaluate the extent of these problems.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_NR1	Buzzards Bay Coalition	Water Quality	Nasketucket River	Nasketucket River Estuary, Fairhaven	41.639125	-70.868114
BBC_NR3	Buzzards Bay Coalition	Water Quality	Nasketucket River	Nasketucket River Marsh, Fairhaven	41.640893	-70.870896

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_NR1	05/29/15	09/23/15	0.2	15	1.2	3.2	100	87	60
BBC_NR1	05/29/15	09/23/15	0.7	15	1.1	2.8	100	93	67
BBC_NR1	06/07/16	09/20/16	0.2	12	2.0	3.5	100	92	58
BBC_NR1	06/07/16	09/20/16	1.1	7	3.2	4.3	100	100	29
BBC_NR1	07/15/17	09/21/17	0.4	5	2.9	4.6	80	60	40
BBC_NR1	06/07/17	09/21/17	0.7	13	1.5	4.2	85	62	31
BBC_NR1	06/04/18	09/04/18	0.2	6	1.9	4.3	83	67	50
BBC_NR1	05/30/18	09/18/18	0.6	12	1.2	3.4	100	83	67
BBC_NR1	05/31/19	09/18/19	0.2	8	1.8	3.8	88	88	63
BBC_NR1	05/31/19	09/24/19	0.7	15	2.6	4.1	93	87	47
BBC_NR3	08/25/15	08/25/15	0.1	1	5.8	5.8	100	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_NR1	05/29/15	09/23/15	0.2	18	15	26.1	23.8	0
BBC_NR1	05/29/15	09/23/15	0.8	14	11	26.3	24.5	0
BBC_NR1	06/07/16	09/20/16	0.2	15	14	29.0	24.2	0
BBC_NR1	06/07/16	09/20/16	1.1	7	6	24.8	23.5	0
BBC_NR1	07/06/17	09/21/17	0.4	7	6	28.8	24.7	0
BBC_NR1	06/07/17	09/21/17	0.7	13	11	24.0	20.7	0
BBC_NR1	06/04/18	09/04/18	0.2	9	9	27.5	22.5	0
BBC_NR1	05/30/18	09/18/18	0.6	12	10	26.9	23.5	0
BBC_NR1	05/31/19	09/18/19	0.2	11	9	26.3	23.3	0
BBC_NR1	05/31/19	09/24/19	0.7	15	12	26.4	22.1	0
BBC_NR3	07/13/15	08/25/15	0.1	4	4	23.0	20.6	0
BBC_NR3	07/05/16	08/15/16	0.2	3	3	25.0	23.3	0
BBC_NR3	07/06/17	07/06/17	0.2	1	1	19.7	19.7	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)**Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_NR1	2015	0.2	4	0.58	0.98	0.71	4	2.76	12.09	7.24	1	1
BBC_NR1	2016	0.2	4	0.69	0.80	0.75	4	3.90	12.02	7.16	2	1
BBC_NR1	2017	0.1	4	0.84	1.30	1.03	4	3.72	22.83	9.71	1	1
BBC_NR1	2018	0.2	3	0.73	1.17	1.00	3	3.78	9.12	7.04	1	0
BBC_NR1	2019	0.2	3	0.89	1.51	1.12	3	2.58	6.01	4.34	2	0
BBC_NR3	2015	0.1	4	1.07	1.31	1.17	4	4.18	21.69	13.66	1	2
BBC_NR3	2016	0.2	3	1.01	1.29	1.12	3	3.53	20.57	9.91	1	1
BBC_NR3	2017	0.2	1	1.44	1.44	1.44	1	11.41	11.41	11.41	0	1

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_NR1	07/17/15	08/19/15	4	0.8	1.4	1.2
BBC_NR1	07/20/16	09/20/16	3	1.0	1.6	1.3
BBC_NR1	07/22/17	09/21/17	2	0.9	1.7	1.3

Toxics and other pollutants (metals, ammonia, chlorine)**Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_NR1	07/13/15	08/25/15	0.2	4	0.021	0.144	0.068
BBC_NR1	07/05/16	08/15/16	0.2	4	0.023	0.095	0.049
BBC_NR1	07/06/17	08/17/17	0.1	4	0.004	0.111	0.070
BBC_NR1	07/24/18	08/21/18	0.2	3	0.070	0.123	0.103
BBC_NR1	07/11/19	08/15/19	0.2	3	0.060	0.091	0.076
BBC_NR3	07/13/15	08/25/15	0.1	4	0.045	0.056	0.050
BBC_NR3	07/05/16	08/15/16	0.2	3	0.048	0.126	0.077
BBC_NR3	07/06/17	07/06/17	0.2	1	0.033	0.033	0.033

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Nasketucket River (MA95-67); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Insufficient Information	YES
2022 Use Attainment Summary	
Nasketucket River (MA95-67): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0278 sq mi (87%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0278 sq mi (87%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area \geq 0.0001 sq mi.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB22.1	Nasketucket River and Approach	Prohibited	0.02777	86.7%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Nasketucket River AU (MA95-67) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	

No *Enterococci* bacteria data are available to assess the Primary Contact Recreational Use for this Nasketucket River AU (MA95-67) so it is Not Assessed.

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Nasketucket River (MA95-67): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0278 sq mi (87%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for this Nasketucket River AU (MA95-67) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Nasketucket River (MA95-67): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0278 sq mi (87%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

New Bedford Inner Harbor (MA95-42)

Location:	Coggeshall Street/Howland Road bridge, New Bedford/Fairhaven to hurricane barrier, Fairhaven/New Bedford.
AU Type:	ESTUARY
AU Size:	1.25 SQUARE MILES
Classification/Qualifier:	SB: SFR, CSO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Debris*)		Unchanged
5	5	Dissolved Oxygen		Unchanged
5	5	Enterococcus	36171	Unchanged
5	5	Fecal Coliform	36171	Unchanged
5	5	Metals		Unchanged
5	5	Nitrogen, Total		Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
5	5	Odor		Unchanged
5	5	Oil and Grease		Unchanged
5	5	PCBs in Fish Tissue		Unchanged
5	5	Polychlorinated Biphenyls (PCBs)		Unchanged
5	5	Trash		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Debris*)	Combined Sewer Overflows (N)				X	X	X
(Debris*)	Municipal (Urbanized High Density Area) (N)				X	X	X
Dissolved Oxygen	Agriculture (Y)	X					
Dissolved Oxygen	Combined Sewer Overflows (N)	X					
Dissolved Oxygen	Municipal Point Source Discharges (Y)	X					
Dissolved Oxygen	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Dissolved Oxygen	Residential Districts (Y)	X					
Enterococcus	Combined Sewer Overflows (N)					X	X
Enterococcus	Municipal (Urbanized High Density Area) (N)					X	X
Fecal Coliform	Combined Sewer Overflows (N)			X			
Fecal Coliform	Municipal (Urbanized High Density Area) (N)			X			
Metals	CERCLA NPL (Superfund) Sites (Y)	X					
Metals	Contaminated Sediments (Y)	X					
Nitrogen, Total	Agriculture (Y)	X					
Nitrogen, Total	Combined Sewer Overflows (N)	X					

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Nitrogen, Total	Municipal Point Source Discharges (Y)	X					
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nitrogen, Total	Residential Districts (Y)	X					
Nutrient/Eutrophication Biological Indicators	Agriculture (Y)	X					
Nutrient/Eutrophication Biological Indicators	Combined Sewer Overflows (N)	X					
Nutrient/Eutrophication Biological Indicators	Municipal Point Source Discharges (Y)	X					
Nutrient/Eutrophication Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nutrient/Eutrophication Biological Indicators	Residential Districts (Y)	X					
Odor	Combined Sewer Overflows (N)				X	X	X
Odor	Municipal (Urbanized High Density Area) (N)				X	X	X
Oil and Grease	Combined Sewer Overflows (N)				X	X	X
Oil and Grease	Municipal (Urbanized High Density Area) (N)				X	X	X
PCBs in Fish Tissue	CERCLA NPL (Superfund) Sites (Y)		X				
PCBs in Fish Tissue	Contaminated Sediments (Y)		X				
Polychlorinated Biphenyls (PCBs)	CERCLA NPL (Superfund) Sites (Y)	X		X			
Polychlorinated Biphenyls (PCBs)	Contaminated Sediments (Y)	X		X			
Trash	Combined Sewer Overflows (N)				X	X	X
Trash	Municipal (Urbanized High Density Area) (N)				X	X	X

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at eight locations (some in New Bedford and some in Fairhaven) throughout the New Bedford Inner Harbor AU (MA95-42) in the summers of 2015-2019, from inner to outer as follows: BBC_AR2, AR2A, AR2B, NB2, NB7, NB1AN, FTP, NB1. Most sample stations were close to shore (from jetties, docks, and piers), with the exception of BBC_AR2B (located in the middle of what is described by the BBC as the “Acushnet River estuary”) and BBC_FTP (located offshore of what is described by the BBC as the “Fairhaven Treatment Plant”). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column (at depths ranging 0.7-3m for the nearshore samples and 4.7-6.1m for the two stations located further from shore) and was usually conducted weekly (between the hours of 6 & 9am). The maximum temperature was 28°C (n=707). The minimum dissolved oxygen (DO) was 2.0mg/L (n=685), with the most persistent poor water quality conditions documented in the inner harbor/ “Acushnet River estuary” (BBC_AR2A & AR2B) and close to shore between pier 3 and the State pier (BBC_NB7). Excursions from the DO criterion (5.0mg/L) usually occurred for >10% of the measurements annually, at a range of depths including surface waters and those excursions were frequently severe (<4.0mg/L). Nutrient sampling efforts (ebb tides in June-September n=92, maximum of 2.3mg/L at BBC_AR2A) documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.44-0.86mg/L, the averages 12/19 times being >0.5mg/L. The chlorophyll *a* maximum was 176µg/L (n=148), on 99 occasions >5µg/L and being >10µg/L for 36% of the measurements overall, though concentrations were most typically <50µg/L. The BBC recorded Secchi disk depths at most stations, usually weekly in the summers of 2015-2019; a minimum of 0.3m was documented at AR2A in 2016, though yearly averages ranged from 1.2-2.8m (n=415). Ammonia-nitrogen concentrations were elevated at times, ranging 0.004 to 0.63mg/L (n=148), however TUs for ammonia-nitrogen could not be calculated (lack of quality assured pH and salinity data). The Town of Fairhaven (MA0100765) collected harbor water near a small sandy beach near the corner of Church Street & Main Street, Fairhaven for site control in their WET tests. Survival of *M. beryllina* (exposed 7-days) to harbor water was good (≥88%) (n=9 tests between March 2016 and March 2020). Nine valid tests were conducted on the Fairhaven WWTP effluent (outfall 001) between March 2016 and March 2020 using *M. beryllina*. The LC50s were all >100% effluent although some toxicity was present in the whole effluent (acute no observed effect concentration or ANOEC= 50% effluent) in the March 2017 test event. The CNOEC results ranged from 50 to 100% effluent and all chronic tests met the CNOEC limit of ≥12.2% effluent. Results of the chronic *Arbacia punctulata* fertilization tests also met the permit limit (CNOEC results ranged from 50 to 100% effluent). The Aquatic Life Use for New Bedford Inner Harbor (MA95-42) will continue to be assessed as Not Supporting based on the water quality data collected throughout the harbor by the BBC staff/volunteers in 2015-2019 which are indicative of poor conditions. The impairments for Dissolved Oxygen, Metals, Total Nitrogen, Nutrient/Eutrophication Biological Indicators, and PCB's are all being carried forward.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_AR2	Buzzards Bay Coalition	Water Quality	New Bedford Harbor	Acushnet River Estuary, New Bedford	41.653913	-70.919395
BBC_AR2A	Buzzards Bay Coalition	Water Quality	New Bedford Harbor	Acushnet River Estuary, New Bedford	41.653742	-70.915714
BBC_AR2B	Buzzards Bay Coalition	Water Quality	New Bedford Harbor	Acushnet River Estuary, New Bedford	41.648891	-70.9186
BBC_FTP	Buzzards Bay Coalition	Water Quality	New Bedford Harbor	Fairhaven Treatment Plant, Fairhaven	41.6313	-70.907497
BBC_NB1	Buzzards Bay Coalition	Water Quality	New Bedford Harbor	New Bedford Harbor Inner, Fairhaven	41.628472	-70.90458
BBC_NB1AN	Buzzards Bay Coalition	Water Quality	New Bedford Harbor	New Bedford Harbor Inner, Fairhaven	41.635825	-70.907748
BBC_NB2	Buzzards Bay Coalition	Water Quality	New Bedford Harbor	New Bedford Harbor Inner, New Bedford	41.639146	-70.911349
BBC_NB7	Buzzards Bay Coalition	Water Quality	New Bedford Harbor	New Bedford Harbor Inner, New Bedford	41.635623	-70.921052

*Toxicological Monitoring Information (Ambient, Effluent, Sediment)***Fairhaven WWTP (MA95-42) Whole Effluent Toxicity and ambient testing information summary.** (MassDEP Undated9)

The NPDES Permit (MA0100765) for the Town of Fairhaven WWTP to discharge to the Acushnet River/New Bedford Inner Harbor (MA95-42) was renewed in September 2017. The discharge limitation and monitoring requirement for toxicity testing remained the same as the prior permit, which became effective in 2003.

Ambient

Water from New Bedford Inner Harbor was collected near a small sandy beach below the corner of Church Street and Main Street in Fairhaven, MA for use as dilution water for the Fairhaven WWTP chronic whole effluent toxicity tests. Between March 2016 and March 2020, survival of *M. beryllina* exposed (7-day) was $\geq 88\%$, (n=9).

Effluent

A total of 9 modified acute and chronic whole effluent toxicity tests were conducted on the Fairhaven WWTP treated effluent (outfall #001) using *M. beryllina* between March 2016 and March 2020. The LC50s were all $>100\%$ effluent although some toxicity was present in the whole effluent (acute no observed effect concentration or ANOEC= 50% effluent) in the March 2017 test event. The CNOEC results ranged from 50 to 100% effluent and all chronic tests met the CNOEC limit of $\geq 12.2\%$ effluent (n=9 valid tests). Results of the chronic *Arbacia punctulata* fertilization tests also met the permit limit (CNOEC results ranged from 50 to 100% effluent).

*Physico-chemical Water Quality Information**DO, pH, Temperature***Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_AR2	07/31/15	07/31/15	0.2	1	6.6	6.6	0	0	0
BBC_AR2	07/31/15	07/31/15	0.7	1	6.4	6.4	0	0	0
BBC_AR2	06/19/18	06/19/18	0.1	1	4.8	4.8	100	100	0
BBC_AR2A	08/07/15	08/07/15	0.2	1	3.3	3.3	100	100	100
BBC_AR2A	08/07/15	08/07/15	1.4	1	2.8	2.8	100	100	100
BBC_AR2A	07/29/16	09/12/16	0.2	2	3.4	4.4	100	50	50
BBC_AR2A	07/29/16	09/12/16	1.7	2	3.1	4.3	100	50	50
BBC_AR2A	06/07/17	09/17/17	0.2	16	3.0	4.2	100	69	31
BBC_AR2A	06/07/17	09/17/17	2.2	16	3.0	3.9	94	94	50
BBC_AR2A	05/30/18	05/30/18	0.2	1	7.4	7.4	0	0	0
BBC_AR2A	05/30/18	05/30/18	2.9	1	6.2	6.2	0	0	0
BBC_AR2B	07/24/18	08/21/18	0.2	3	4.9	5.4	67	67	0
BBC_AR2B	07/02/19	08/15/19	0.4	7	4.2	5.9	57	29	0
BBC_AR2B	07/02/19	07/31/19	5.0	3	3.7	5.0	100	33	33
BBC_FTP	05/28/15	09/22/15	0.2	17	5.4	6.4	47	0	0
BBC_FTP	05/28/15	09/22/15	4.9	17	5.2	6.2	47	0	0
BBC_FTP	05/31/16	09/24/16	0.2	17	4.6	6.8	12	6	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_FTP	05/31/16	09/24/16	5.0	17	4.4	6.4	24	6	0
BBC_FTP	06/12/17	09/16/17	0.2	19	5.7	6.9	11	0	0
BBC_FTP	06/12/17	09/16/17	5.6	19	4.6	6.4	21	5	0
BBC_FTP	06/01/18	09/20/18	0.2	25	4.2	6.6	28	8	0
BBC_FTP	06/01/18	09/20/18	6.2	22	3.9	6.2	36	14	5
BBC_FTP	07/02/19	09/18/19	0.3	11	5.5	6.9	9	0	0
BBC_FTP	07/02/19	09/18/19	4.8	8	5.4	6.4	25	0	0
BBC_NB1	05/28/15	09/24/15	0.2	17	6.0	7.8	0	0	0
BBC_NB1	05/28/15	09/24/15	2.6	17	5.5	7.3	6	0	0
BBC_NB1	06/06/16	09/25/16	0.2	20	5.5	7.3	10	0	0
BBC_NB1	06/06/16	09/25/16	2.6	20	5.5	6.9	5	0	0
BBC_NB1	05/31/17	09/21/17	0.2	20	5.5	6.9	15	0	0
BBC_NB1	05/31/17	09/21/17	2.7	19	5.5	6.7	16	0	0
BBC_NB1	06/04/18	09/20/18	0.2	19	6.5	8.2	0	0	0
BBC_NB1	06/04/18	09/20/18	2.6	18	5.5	7.4	6	0	0
BBC_NB1	05/30/19	09/23/19	0.2	19	7.0	8.7	0	0	0
BBC_NB1	05/30/19	09/23/19	2.7	19	6.5	8.1	0	0	0
BBC_NB2	08/07/15	12/09/15	0.2	3	4.6	6.0	67	33	0
BBC_NB2	08/07/15	08/19/15	2.0	2	4.4	4.9	100	50	0
BBC_NB2	01/06/16	09/20/16	0.2	5	4.1	7.4	20	20	0
BBC_NB2	08/31/16	09/20/16	2.9	3	4.4	5.5	67	67	0
BBC_NB2	01/09/17	09/19/17	0.2	5	4.7	8.2	20	20	0
BBC_NB2	05/30/17	06/17/17	0.8	4	6.0	7.9	0	0	0
BBC_NB2	05/31/18	08/21/18	0.2	14	2.0	4.6	93	57	14
BBC_NB2	05/31/18	08/21/18	2.5	16	2.0	3.4	100	100	50
BBC_NB7	06/17/15	09/09/15	0.2	18	4.0	5.6	61	39	0
BBC_NB7	06/17/15	09/09/15	3.0	18	2.6	5.2	56	50	22
BBC_NB7	06/11/16	09/24/16	0.2	23	3.0	5.3	65	39	13
BBC_NB7	06/11/16	09/24/16	2.8	24	2.5	4.9	79	42	21
BBC_NB7	06/07/17	09/20/17	0.2	20	2.5	4.6	75	55	25
BBC_NB7	06/07/17	09/20/17	2.6	21	3.0	4.8	81	52	33
BBC_NB7	05/31/18	09/20/18	0.2	24	2.5	4.8	71	54	29
BBC_NB7	05/31/18	09/20/18	2.6	25	3.0	4.9	76	48	20
BBC_NB7	05/30/19	09/23/19	0.2	22	3.0	5.0	73	41	27
BBC_NB7	05/30/19	09/23/19	2.7	22	2.5	5.2	64	32	14

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_AR2	07/31/15	07/31/15	0.2	1	1	26.0	26.0	0
BBC_AR2	07/31/15	07/31/15	0.7	1	1	25.9	25.9	0
BBC_AR2	06/19/18	06/19/18	0.1	1	1	21.1	21.1	0
BBC_AR2A	06/16/15	09/24/15	0.2	8	7	26.0	24.0	0
BBC_AR2A	08/07/15	08/07/15	1.4	1	1	25.4	25.4	0
BBC_AR2A	01/06/16	09/12/16	0.2	10	8	28.0	24.2	0
BBC_AR2A	07/29/16	09/12/16	1.7	2	2	26.9	24.7	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_AR2A	03/08/17	09/17/17	0.2	23	21	25.9	21.8	0
BBC_AR2A	06/07/17	09/17/17	2.2	16	15	25.5	21.7	0
BBC_AR2A	05/30/18	07/10/18	0.2	2	1	24.7	24.7	0
BBC_AR2A	05/30/18	05/30/18	2.9	1	0	17.6	17.6	--
BBC_AR2A	08/08/19	08/15/19	0.2	2	2	25.0	24.5	0
BBC_AR2B	07/24/18	08/21/18	0.2	3	3	27.4	25.7	0
BBC_AR2B	07/02/19	08/15/19	0.4	8	8	25.8	23.9	0
BBC_AR2B	07/02/19	07/31/19	5.0	3	3	24.3	23.1	0
BBC_FTP	05/28/15	09/22/15	0.2	20	17	25.4	23.0	0
BBC_FTP	05/28/15	09/22/15	5.0	17	14	25.4	22.7	0
BBC_FTP	05/31/16	09/24/16	0.2	25	21	27.0	23.6	0
BBC_FTP	05/31/16	09/24/16	4.9	22	18	26.1	23.2	0
BBC_FTP	05/31/17	09/16/17	0.2	22	20	24.9	22.2	0
BBC_FTP	05/31/17	09/16/17	5.6	20	18	24.5	21.9	0
BBC_FTP	06/01/18	09/20/18	0.2	25	24	26.8	23.4	0
BBC_FTP	06/01/18	09/20/18	6.1	22	21	26.7	22.8	0
BBC_FTP	07/02/19	09/18/19	0.3	12	11	25.6	23.3	0
BBC_FTP	07/02/19	09/18/19	4.7	8	7	25.3	23.1	0
BBC_NB1	05/28/15	09/24/15	0.2	19	15	25.0	21.8	0
BBC_NB1	05/28/15	09/24/15	2.6	17	14	24.0	21.0	0
BBC_NB1	06/01/16	09/25/16	0.2	26	24	26.5	22.6	0
BBC_NB1	06/06/16	09/25/16	2.6	20	18	26.0	22.2	0
BBC_NB1	01/09/17	09/21/17	0.2	27	22	23.9	20.4	0
BBC_NB1	05/31/17	09/21/17	2.7	19	17	22.8	20.2	0
BBC_NB1	06/04/18	09/20/18	0.2	21	20	27.1	23.0	0
BBC_NB1	06/04/18	09/20/18	2.6	18	17	26.0	22.4	0
BBC_NB1	05/30/19	09/23/19	0.2	22	19	26.0	22.6	0
BBC_NB1	05/30/19	09/23/19	2.7	19	16	25.0	21.9	0
BBC_NB1AN	06/16/15	08/25/15	0.2	6	6	26.0	23.8	0
BBC_NB1AN	01/06/16	06/15/16	0.2	4	2	20.0	20.0	0
BBC_NB2	06/16/15	12/09/15	0.2	13	9	26.3	24.2	0
BBC_NB2	08/07/15	08/19/15	2.0	2	2	26.1	25.6	0
BBC_NB2	01/06/16	09/20/16	0.2	13	8	28.0	23.8	0
BBC_NB2	08/31/16	09/20/16	2.9	3	2	25.2	24.2	0
BBC_NB2	01/09/17	09/19/17	0.2	13	9	26.4	21.5	0
BBC_NB2	05/30/17	06/17/17	0.8	4	3	19.4	18.0	0
BBC_NB2	05/31/18	08/21/18	0.2	16	15	27.5	23.3	0
BBC_NB2	05/31/18	08/21/18	2.5	16	15	26.2	21.9	0
BBC_NB2	07/25/19	08/15/19	0.2	3	3	25.0	23.7	0
BBC_NB7	06/17/15	09/09/15	0.2	18	18	26.0	23.7	0
BBC_NB7	06/17/15	09/09/15	3.0	18	18	26.0	23.6	0
BBC_NB7	06/11/16	09/24/16	0.2	24	20	28.0	24.4	0
BBC_NB7	06/11/16	09/24/16	2.8	22	18	28.0	24.2	0
BBC_NB7	06/07/17	09/20/17	0.2	25	23	26.0	21.6	0
BBC_NB7	06/07/17	09/20/17	2.6	21	19	25.0	21.0	0
BBC_NB7	05/31/18	09/20/18	0.2	28	25	27.0	23.6	0
BBC_NB7	05/31/18	09/20/18	2.5	24	21	27.0	23.3	0
BBC_NB7	05/30/19	09/23/19	0.2	26	24	25.0	22.2	0
BBC_NB7	05/30/19	09/23/19	2.7	22	20	25.1	21.7	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_AR2A	2015	0.2	7	0.41	0.64	0.51	7	4.65	28.57	12.65	1	5
BBC_AR2A	2016	0.2	4	0.27	0.63	0.49	10	0.62	176.20	24.08	4	3
BBC_AR2A	2017	0.2	5	0.43	2.29	0.86	8	3.04	59.93	16.50	2	4
BBC_AR2A	2018	0.2	2	0.35	1.67	1.01	2	2.35	19.13	10.74	1	1
BBC_AR2A	2019	0.2	2	0.45	0.85	0.65	2	1.39	12.59	6.99	1	1
BBC_AR2B	2018	0.2	2	0.56	0.66	0.61	3	10.08	21.33	14.38	0	3
BBC_AR2B	2019	0.2	3	0.46	0.81	0.65	4	2.53	13.79	8.17	1	1
BBC_FTP	2015	0.2	--	--	--	--	3	9.90	11.28	10.36	0	1
BBC_FTP	2016	0.3	--	--	--	--	3	3.74	5.42	4.62	2	0
BBC_FTP	2017	0.2	--	--	--	--	2	5.64	32.25	18.95	0	1
BBC_FTP	2018	0.2	--	--	--	--	3	5.71	15.72	9.32	0	1
BBC_FTP	2019	0.2	4	0.58	1.10	0.80	4	7.22	11.65	9.91	0	2
BBC_NB1	2015	0.2	2	0.42	0.45	0.43	2	10.04	10.41	10.23	0	1
BBC_NB1	2016	0.2	3	0.37	0.54	0.44	8	3.76	64.49	19.34	2	4
BBC_NB1	2017	0.2	5	0.51	0.64	0.55	9	3.48	22.47	9.05	3	3
BBC_NB1	2018	0.2	3	0.37	0.61	0.47	4	5.64	12.89	8.21	0	1
BBC_NB1	2019	0.2	3	0.42	0.49	0.45	3	0.32	6.33	3.61	2	0
BBC_NB1AN	2015	0.2	5	0.35	0.56	0.44	6	4.77	97.44	25.43	1	3
BBC_NB1AN	2016	0.2	--	--	--	--	4	0.48	15.32	6.46	2	1
BBC_NB2	2015	0.2	7	0.38	0.55	0.44	11	0.75	18.49	6.67	4	2
BBC_NB2	2016	0.2	5	0.37	0.64	0.50	12	0.61	25.09	5.97	8	2
BBC_NB2	2017	0.2	6	0.37	1.07	0.59	11	4.57	34.35	10.63	2	2
BBC_NB2	2018	0.2	2	0.36	0.50	0.43	4	4.01	30.41	11.12	2	1
BBC_NB2	2019	0.2	3	0.50	0.71	0.60	3	2.00	6.33	4.17	2	0
BBC_NB7	2015	0.2	4	0.41	0.70	0.54	4	3.37	13.03	8.22	2	2
BBC_NB7	2016	0.2	4	0.57	1.30	0.83	4	4.70	20.31	12.84	1	3
BBC_NB7	2017	0.2	3	0.42	0.66	0.57	4	3.62	78.57	24.50	2	2
BBC_NB7	2018	0.2	4	0.44	0.65	0.58	4	0.20	6.16	4.27	2	0
BBC_NB7	2019	0.2	4	0.43	0.75	0.62	4	3.74	23.09	9.28	2	1

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_AR2A	06/29/15	09/24/15	5	1.4	1.8	1.5
BBC_AR2A	03/08/16	08/15/16	6	0.3	1.8	1.2
BBC_AR2A	03/08/17	09/17/17	21	0.6	2.9	1.9

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_AR2A	05/30/18	08/07/18	2	0.8	2.0	1.4
BBC_AR2A	08/08/19	08/15/19	2	1.5	1.5	1.5
BBC_AR2B	07/24/18	08/21/18	3	1.6	2.0	1.7
BBC_AR2B	07/02/19	08/15/19	7	1.4	2.0	1.7
BBC_FTP	05/28/15	09/22/15	20	1.1	2.9	2.2
BBC_FTP	05/31/16	09/24/16	25	1.5	4.5	2.6
BBC_FTP	05/31/17	09/16/17	22	1.2	3.0	2.2
BBC_FTP	06/01/18	09/20/18	23	1.3	2.8	2.1
BBC_FTP	07/02/19	09/18/19	11	1.4	3.1	2.0
BBC_NB1	05/28/15	09/24/15	17	1.6	2.7	2.0
BBC_NB1	06/01/16	09/17/16	21	1.4	3.2	2.1
BBC_NB1	03/08/17	09/21/17	25	1.5	3.0	2.1
BBC_NB1	06/04/18	09/20/18	23	1.3	2.8	2.0
BBC_NB1	05/30/19	09/23/19	21	1.3	2.9	2.1
BBC_NB1AN	06/16/15	08/25/15	6	1.4	1.9	1.7
BBC_NB1AN	03/08/16	06/15/16	3	1.7	1.9	1.8
BBC_NB2	06/16/15	10/09/15	11	1.1	2.3	1.6
BBC_NB2	01/06/16	09/20/16	12	1.1	2.5	1.9
BBC_NB2	01/09/17	09/19/17	11	1.2	2.6	1.8
BBC_NB2	05/31/18	08/21/18	16	1.2	2.6	2.0
BBC_NB2	07/25/19	08/15/19	3	1.4	1.6	1.5
BBC_NB7	06/17/15	09/09/15	13	1.9	3.5	2.8
BBC_NB7	06/11/16	09/24/16	24	1.6	3.4	2.7
BBC_NB7	06/07/17	09/20/17	16	1.9	3.4	2.8
BBC_NB7	05/31/18	09/20/18	24	2.0	4.3	2.8
BBC_NB7	05/30/19	09/23/19	22	2.0	3.7	2.8

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

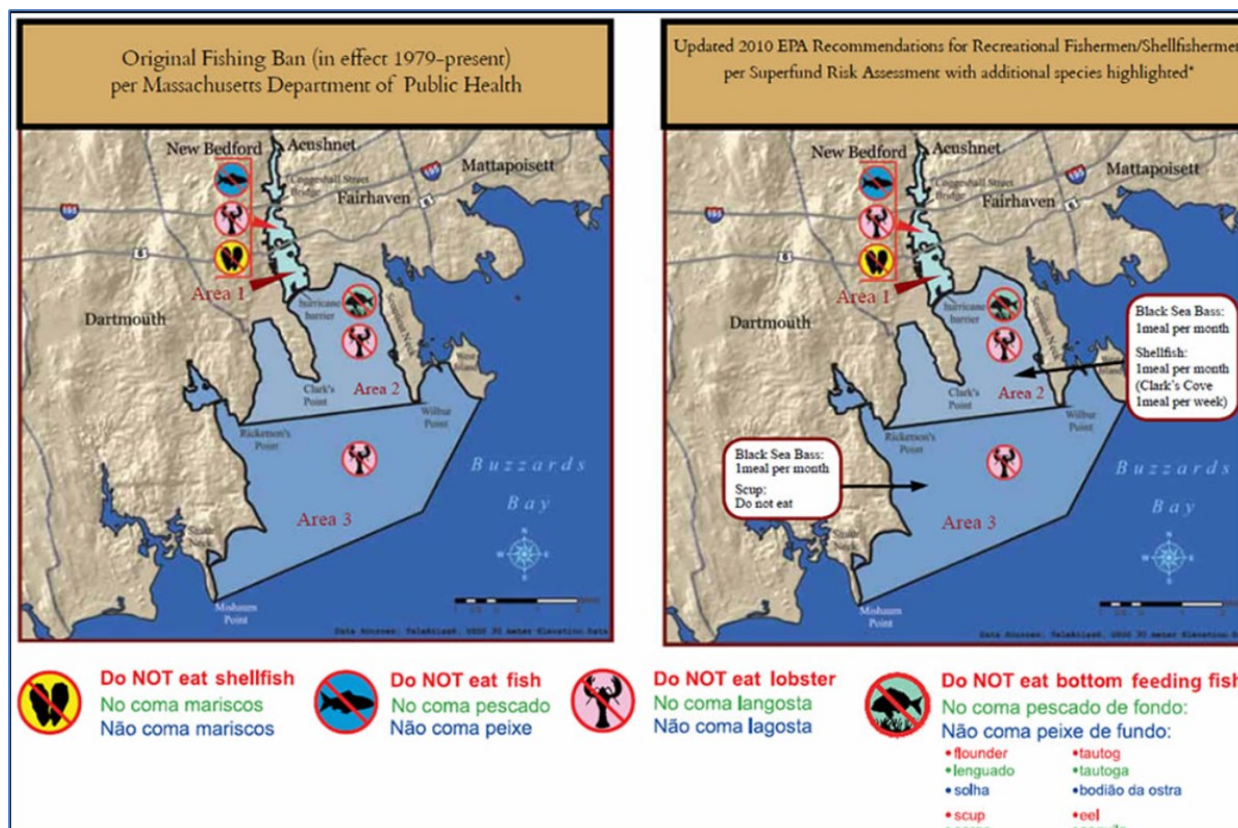
Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_AR2A	06/16/15	09/24/15	0.2	7	0.012	0.162	0.078
BBC_AR2A	01/06/16	09/26/16	0.2	10	0.004	0.197	0.039
BBC_AR2A	03/08/17	09/05/17	0.2	8	0.004	0.113	0.038
BBC_AR2A	07/10/18	08/07/18	0.2	2	0.007	0.012	0.010
BBC_AR2A	08/08/19	08/15/19	0.2	2	0.052	0.072	0.062
BBC_AR2B	07/24/18	08/21/18	0.2	3	0.005	0.118	0.051
BBC_AR2B	07/11/19	08/15/19	0.2	4	0.005	0.144	0.061
BBC_FTP	07/13/15	08/25/15	0.2	3	0.079	0.487	0.320
BBC_FTP	07/05/16	08/15/16	0.3	3	0.019	0.070	0.037
BBC_FTP	08/03/17	08/17/17	0.2	2	0.055	0.368	0.211
BBC_FTP	07/24/18	08/21/18	0.2	3	0.190	0.627	0.374

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_FTP	07/11/19	08/15/19	0.2	4	0.094	0.419	0.204
BBC_NB1	09/10/15	09/24/15	0.2	2	0.066	0.083	0.074
BBC_NB1	06/01/16	09/26/16	0.2	8	0.004	0.096	0.026
BBC_NB1	01/09/17	09/19/17	0.2	9	0.004	0.118	0.054
BBC_NB1	07/10/18	08/21/18	0.2	4	0.004	0.065	0.027
BBC_NB1	07/25/19	08/15/19	0.2	3	0.067	0.089	0.080
BBC_NB1AN	06/16/15	08/25/15	0.2	6	0.008	0.075	0.037
BBC_NB1AN	01/06/16	06/15/16	0.2	4	0.004	0.040	0.013
BBC_NB2	06/16/15	12/09/15	0.2	11	0.011	0.129	0.065
BBC_NB2	01/06/16	09/26/16	0.2	12	0.004	0.144	0.034
BBC_NB2	01/09/17	09/19/17	0.2	11	0.004	0.090	0.029
BBC_NB2	07/10/18	08/21/18	0.2	4	0.004	0.148	0.043
BBC_NB2	07/25/19	08/15/19	0.2	3	0.028	0.102	0.076
BBC_NB7	07/13/15	08/25/15	0.2	4	0.014	0.141	0.072
BBC_NB7	07/05/16	08/15/16	0.2	4	0.025	0.188	0.086
BBC_NB7	07/06/17	08/17/17	0.2	4	0.004	0.064	0.042
BBC_NB7	07/10/18	08/21/18	0.2	4	0.054	0.194	0.128
BBC_NB7	07/11/19	08/15/19	0.2	4	0.068	0.167	0.130

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
The Fish Consumption Use for New Bedford Inner Harbor (MA95-42) will continue to be assessed as Not Supporting with the PCBs in Fish Tissue impairment being carried forward. EPA and MA DPH recommend the public not eat any shellfish, fish, or lobster from area 1 of New Bedford Harbor (includes New Bedford Inner Harbor) because of PCB contamination (EPA 2022).	

New Bedford Harbor Fish Consumption Regulations and Recommendations (EPA 2022)



Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
<p>New Bedford Inner Harbor (MA95-42): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.1955 sq mi (96%). The sum of the approved, conditionally approved, and restricted shellfish growing areas represents 0 sq mi (0%). The prohibited shellfish growing area represents 1.1955 sq mi (96%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of prohibited and approved, conditionally approved, and/or restricted. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.</p>	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB15.11	New Bedford/Fairhaven Inner Harbor	Prohibited	1.02637	82.2%
BB15.12	New Bedford Inner Harbor; Palmers Island Periphery	Prohibited	0.15318	12.3%
BB15.13	Palmers Cove; Southwest Corner	Prohibited	0.01593	1.3%

Aesthetic

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No recent data are available to assess the status of the Aesthetic Use for New Bedford Inner Harbor (MA95-42), so it will continue to be assessed as Not Supporting with the Debris, Odor, Oil and Grease, and Trash impairments all being carried forward.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Although no recent <i>Enterococci</i> bacteria data are available to assess the status of the Primary Contact Recreation Use for New Bedford Inner Harbor (MA95-42), it will continue to be assessed as Not Supporting based on a presumptive impairment decision because of the presence of active CSO outfalls (this waterbody does not have a CSO variance in place). The Debris, <i>Enterococcus</i> , Odor, Oil and Grease, and Trash impairments are all being carried forward.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
New Bedford Inner Harbor (MA95-42): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.1955 sq mi (96%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Although no recent <i>Enterococci</i> bacteria data are available to assess the status of the Secondary Contact Recreation Use for New Bedford Inner Harbor (MA95-42), it will continue to be assessed as Not Supporting based on a presumptive impairment decision because of the presence of active CSO outfalls (this waterbody does not have a CSO variance in place). The Debris, <i>Enterococcus</i> , Odor, Oil and Grease, and Trash impairments are all being carried forward.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
New Bedford Inner Harbor (MA95-42): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.1955 sq mi (96%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

New Bedford Reservoir (MA95110)

Location:	Acushnet.
AU Type:	FRESHWATER LAKE
AU Size:	210 ACRES
Classification/Qualifier:	B: WWF, HQW

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Aquatic Plants (Macrophytes)*)		Unchanged
5	5	(Non-Native Aquatic Plants*)		Unchanged
5	5	DDT in Fish Tissue		Unchanged
5	5	Dissolved Oxygen		Unchanged
5	5	Mercury in Fish Tissue		Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Unchanged
5	5	Phosphorus, Total		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Aquatic Plants (Macrophytes)*)	Source Unknown (N)			X	X	X
(Non-Native Aquatic Plants*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
DDT in Fish Tissue	Source Unknown (N)		X			
Dissolved Oxygen	Source Unknown (N)	X				
Mercury in Fish Tissue	Source Unknown (N)		X			
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)	X		X	X	X
Phosphorus, Total	Source Unknown (N)	X		X	X	X

Recommendations

2022 Recommendations
ALU: Continue to monitor water quality in New Bedford Reservoir (MA95110), in particular for total phosphorus and chlorophyll <i>a</i> (at a representative location in the reservoir), in light of the good water quality data collected by the BBC just upstream of Lake Street in 2015-2019. Consider delisting the Total Phosphorus and Nutrient Enrichment Biological Indicators impairments if conditions continue to improve.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

DMF biologists note one structure at the downstream end of the New Bedford Reservoir affecting the passage of diadromous fish between the reservoir and the downstream Acushnet River AU (MA95-31). The New Bedford Reservoir Dam (NATID# MA01014) (with existing fishway) located upstream of Leonard Street in Acushnet, was given a passage score of "2" on a 0-10 scale, indicating that the dam is only a minor obstruction to the passage of the targeted fish species, river herring and American eel. The population score was noted to be "5" in this area. It was further noted by DMF that passage was adequate at this dam and only future maintenance was recommended. As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, variable milfoil (*Myriophyllum heterophyllum*), in New Bedford Reservoir during an August 1995 synoptic survey. Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at one location in New Bedford Reservoir, Acushnet (MA95110) in the summers of 2015-2019 just upstream of Lake Street (BBC_ARL). Monitoring was conducted in the surface water, as well as deeper in the water column (at depths ranging 0.6-1.1m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 28.2°C (n=69). The minimum dissolved oxygen (DO) was 0.4mg/L (n=57), <5.0mg/L 36 times between May and September (~63% of the measurements overall), 14 times between May and July (when anadromous fish early life stages are potentially present) (~25% of the measurements) and <4.0mg/L 21 times (~37% of the measurements). Excursions from the 5.0mg/L criterion occurred at a similar frequency at the surface and at depth. Nutrient sampling efforts (in July and August) documented seasonal average total phosphorus concentrations between 0.014-0.015mg/L (n=19, maximum 0.018mg/L). The maximum Chlorophyll *a* was 26.7µg/L (n=18), >16µg/L just once. Secchi disk depths were often low for a freshwater lake, ranging from 0.2-1.2m (n=41), with the yearly average being <1.2m for four out of the five sample years. Ammonia-nitrogen concentrations were generally low (range 0.004 to 0.025mg/L (n=19)), though TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for New Bedford Reservoir (MA95110) will continue to be assessed as Not Supporting with the Dissolved Oxygen and Non-Native Aquatic Plants (for *Myriophyllum heterophyllum*) impairments being carried forward. While data collected by BBC staff/volunteers from 2015-2019 note that total phosphorus concentrations are lower than prior studies (all <0.025mg/L) and chlorophyll *a* was rarely >16µg/L, the impairments for Nutrient Enrichment Biological Indicators and Total Phosphorus are also being carried forward at this time. If future data continues to indicate improved conditions in New Bedford Reservoir delistings for these impairments may be warranted in a future IR reporting cycle.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_ARL	Buzzards Bay Coalition	Water Quality	Acushnet River	Acushnet River Fresh, Acushnet	41.73811	-70.906013

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note one structure at the downstream end of the New Bedford Reservoir AU assisting the passage of diadromous fish between the reservoir and the downstream Acushnet River AU (MA95-31). The New Bedford Reservoir Dam (NATID# MA01014) (with existing fishway) located upstream of Leonard Street in Acushnet, was given a passage score of "2" on a 0-10 scale, indicating that the dam is only a minor obstruction to the passage of the targeted fish species, river herring and American eel. The population score was noted to be "5" in this area. It was further noted by DMF that passage was adequate at this dam and only future maintenance was recommended.

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995)

Summary Statement

As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, variable milfoil (*Myriophyllum heterophyllum*), in New Bedford Reservoir during an August 1995 synoptic survey.

*Physico-chemical Water Quality Information***DO, pH, Temperature (Depth Profiles)****Buzzards Bay Coalition Freshwater Discrete Dissolved Oxygen Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Average Sample depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
BBC_ARL	09/01/15	09/01/15	0.2	1	6.6	6.6	0	0	0
BBC_ARL	07/31/15	09/01/15	0.6	3	5.4	6.8	0	0	0
BBC_ARL	06/30/16	08/31/16	0.2	3	2.3	4.3	2	2	1
BBC_ARL	06/30/16	08/31/16	1.1	3	2.0	3.4	3	2	1
BBC_ARL	06/11/17	09/14/17	0.2	6	4.5	6.3	1	1	0
BBC_ARL	09/07/17	09/14/17	0.8	2	3.0	3.8	2	0	1
BBC_ARL	06/06/18	09/19/18	0.2	9	1.4	3.8	7	2	4
BBC_ARL	06/06/18	09/19/18	1.1	9	0.4	2.4	8	3	6
BBC_ARL	05/30/19	09/23/19	0.2	21	2.5	4.4	13	4	8

Buzzards Bay Coalition Discrete Freshwater Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_ARL	07/13/15	09/01/15	0.2	5	5	28.0	26.0	5	5	0	0
BBC_ARL	07/31/15	09/01/15	0.6	3	3	26.0	25.6	3	3	0	0
BBC_ARL	06/30/16	08/31/16	0.2	7	7	27.5	25.5	7	7	0	0
BBC_ARL	06/30/16	08/31/16	1.1	3	3	26.8	24.9	3	3	0	0
BBC_ARL	06/11/17	09/14/17	0.2	10	10	26.1	21.9	8	4	0	0
BBC_ARL	09/07/17	09/14/17	0.8	2	2	20.7	20.5	2	0	0	0
BBC_ARL	06/06/18	09/19/18	0.2	11	10	28.2	23.3	9	6	0	0
BBC_ARL	06/06/18	09/19/18	1.1	9	8	25.0	21.8	6	3	0	0
BBC_ARL	05/30/19	09/23/19	0.2	24	21	25.5	22.3	16	11	0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)**Buzzards Bay Coalition Freshwater Nutrient Enrichment Indicator Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	DO Sat Max (%)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count >16µg/L
BBC_ARL	2015	0.2	4	0.009	0.018	0.014	--	4	4.80	9.73	7.88	0
BBC_ARL	2016	0.2	4	0.015	0.015	0.015	--	4	2.37	5.21	3.84	0
BBC_ARL	2017	0.2	4	0.015	0.015	0.015	--	4	3.26	26.68	9.29	1
BBC_ARL	2018	0.2	4	0.015	0.015	0.015	--	4	3.44	12.21	7.63	0
BBC_ARL	2019	0.2	3	0.011	0.015	0.014	--	2	4.45	4.68	4.57	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_ARL	07/27/15	08/25/15	2	0.8	1.1	0.9
BBC_ARL	06/30/16	07/18/16	2	1.1	1.2	1.2
BBC_ARL	07/20/17	08/17/17	3	0.5	0.8	0.7
BBC_ARL	06/06/18	09/19/18	10	0.2	1.0	0.7
BBC_ARL	05/30/19	09/23/19	24	0.4	1.1	0.7

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_ARL	07/13/15	08/25/15	0.2	4	0.013	0.025	0.018
BBC_ARL	07/05/16	08/15/16	0.2	4	0.005	0.025	0.012
BBC_ARL	07/06/17	08/17/17	0.2	4	0.004	0.016	0.009
BBC_ARL	07/10/18	08/21/18	0.2	4	0.008	0.018	0.012
BBC_ARL	07/25/19	08/15/19	0.2	3	0.007	0.024	0.013

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
The Fish Consumption Use for New Bedford Reservoir (MA95110) will continue to be assessed as Not Supporting with the DDT in Fish Tissue and Mercury in Fish Tissue impairments being carried forward. MA DPH advises <i>Children under 12, pregnant women, nursing mothers, women of child-bearing age not to eat any American Eel or Largemouth Bass from the reservoir, while the general public should limit American Eel and Largemouth Bass to 2 meals/month</i> (MassDPH 2021).	

Aesthetic

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

No recent data are available to assess the status of the Aesthetic Use for New Bedford Reservoir (MA95110) so it will continue to be assessed as Not Supporting with the Aquatic Plants (Macrophytes), Nutrient/Eutrophication Biological Indicators, and Total Phosphorus impairments being carried forward.

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No recent data are available to assess the status of the Primary Contact Recreation Use for New Bedford Reservoir (MA95110) so it will continue to be assessed as Not Supporting, with the Aquatic Plants (Macrophytes), Nutrient/Eutrophication Biological Indicators, and Total Phosphorus impairments being carried forward.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No recent data are available to assess the status of the Secondary Contact Recreation Use for New Bedford Reservoir (MA95110) so it will continue to be assessed as Not Supporting, with the Aquatic Plants (Macrophytes), Nutrient/Eutrophication Biological Indicators, and Total Phosphorus impairments being carried forward.	

New Long Pond (MA95112)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	21 ACRES
Classification/Qualifier:	B

No usable data were available for New Long Pond (MA95112) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Noquochoke Lake (MA95113)

Location:	(Main Basin) Dartmouth.
AU Type:	FRESHWATER LAKE
AU Size:	88 ACRES
Classification/Qualifier:	A: PWS, ORW

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Aquatic Plants (Macrophytes)*)		Changed
5	5	(Fish Passage Barrier*)		Added
5	5	(Non-Native Aquatic Plants*)		Unchanged
5	5	(Swollen Bladderwort*)		Added
5	5	Enterococcus		Unchanged
5	5	Mercury in Fish Tissue	33880	Unchanged
5	5	PCBs in Fish Tissue		Unchanged
5	5	Turbidity		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Aquatic Plants (Macrophytes)*)	Source Unknown (N)			X	X	X
(Fish Passage Barrier*)	Hydrostructure Impacts on Fish Passage (Y)	X				
(Non-Native Aquatic Plants*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
(Swollen Bladderwort*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
Enterococcus	Source Unknown (N)				X	
Mercury in Fish Tissue	Atmospheric Deposition - Toxics (Y)		X			
Mercury in Fish Tissue	Source Unknown (N)		X			
PCBs in Fish Tissue	CERCLA NPL (Superfund) Sites (Y)		X			
Turbidity	Source Unknown (N)			X	X	X

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Aquatic Plants (Macrophytes)	Not caused by a pollutant (4c)	<p>As described in detail in the 2022 CALM guidance document (MassDEP 2022), the mapping of Aquatic Plants (Macrophytes) impairments as a pollutant is being reevaluated. The main basin of Noquochoke Lake (MA95113) was first listed as impaired for Noxious Aquatic Plants in 1998 and this cause was remapped to Aquatic Plants (Macrophytes) during the 2010 IR cycle (MassDEP, Integrated Listing History 1992-2014 INTLIST_HISTORY.xlsx 2015). The original impairment was based on an August 1995 synoptic survey conducted by MassDEP staff in which it was noted that a small cove of the pond was 75% covered in very dense floating/submerged vegetation, including the non-rooted, floating species, <i>Wolffia</i> sp. (MassDEP 1995, MassDEP 2002). With the possible exception of a Google Earth image from May 2016 (this image might depict pollen or high turbidity as it was more a brown scum than a green one), all images available since 2000 look mostly clear of macrophytes (Google Earth Pro Undated). Since the coverage of aquatic macrophytes observed in the main basin of Noquochoke Lake appears to be <25%, the Aquatic Plants (Macrophytes) impairment is being removed as a pollutant impairment and added back as a non-pollutant impairment.</p>

Aquatic Plants (Macrophytes)

1997 WBS Coding Sheet (MassDEP 2002):

WBID: **MA95113** WATERSHED: **Buzzards Bay (95)** (Printed 02/03/98)
 NAME: **Noquochoke Lake** TYPE: **Lake/Pond**
 CODE: **95113** SIZE: **110.00(acres)** CLASS: **B**

LATITUDE: _____
 LONGITUDE: _____ (413840/710254)
 Lake/Pond Name: **Noquochoke Lake[Main Basin], Dartmouth**
 Ecoregion Name: **0**
 Description: **Noquochoke Lake (Main Basin), Dartmouth.**

Assessment Date: **9704** Begin Sampling: **9508** 303(d) List?: **No**
 Cycle: **97** End Sampling: **9508** Pathogens Only?: **No**

Lake Specific Information

Lake size greater than 10 acres?: **Yes**
 Significantly Publicly Owned: **xxxx**
 Trophic Status: **Eutrophic**
 Trophic Trend: **Unknown**
 Acidity/Toxics Trend: **Unknown**
 Acidity Effects: **Unknown**

Uses	Support	Threat	Partial	Non-Sup	Not-Asses	Not-Attain
OVERALL USE SUPPORT			110.00	110.00		
ALUS				110.00		
FISH CONSUMPTION			105.00	5.00		
PRIMARY CONTACT			50.00	5.00	55.00	
SECONDARY CONTACT			50.00	5.00	55.00	
Aesthetics						

Nonattainment Causes

Code	Size	Magnitude	"New" Code	Size	Magnitude
0300- Priority organics	110.00	M			
0301- (PCB's)	110.00	M			
0500- Metals	110.00	M			
0501- (Mercury)	110.00	M			
2200- Noxious aquatic plants	110.00	M			
2400- Total toxics	110.00	M			
2500- Turbidity	110.00	M			
2600- Exotic species	110.00	M			

Nonattainment Sources

Code	Size	Magnitude	"New" Code	Size	Magnitude
9000- SOURCE UNKNOWN	110.00	H			

Assessment Type

(Assessment Category = > Monitored)
 B25- Ecological/habitat surveys
 (Qualitative/Quantitative)
 R35- Primary Producer Surveys
 R45- Synoptic Physical/Chemical Monitoring

"New" Assessment Category = > M E NA

Media/Pollutants Assessed

03 - Organics in fish tissue
 11 - Metals in fish tissue

(Toxics Monitoring = > Y)

"New" Toxics Monitoring = > YES or NO

Comments:

1997:
 August 4, 1995 synoptic survey indicated turbidity estimated below criteria (<4 feet secchi disk), and very dense floating leaf vegetation along the shores. Also, the non-native species *Myriophyllum heterophyllum* was observed. Department of Public Health fish advisory due to mercury and PCBs in fish flesh.

1995 Synoptic Survey Field Sheet (MassDEP 1995):

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Lake/Pond Noguchoke Lake Date 4 Aug 95

Town/City Dartmouth Observers Brodeur / McVoy

River Basin Buzzards Bay

USGS Topo Fall Line Pass PALIS NO. Main- 95113 North 9517 South 95170

Location/type of access (be specific, e.g., public boat ramp at west cove area off Simpson Street):

① Reed Rd - Informal between N. basin & main basin

② " " " " S. " " " "

Ownership of Location/Access (specify public or private, name of owner(s), and any use restrictions):

① ? N. Basin - ?

② ?

Posted signs (re aquatic plants, fish advisories, access, etc.):

① Both basins - DPH - Fish contaminated w/ PCBs - Child, Pregnant women & nursing mothers - Do Not Eat

② None

Water quality observations (clarity, dissolved organic staining, blooms, et cetera):

① "N. basin" Turbid (brown), sl stain (red) - < 4' SD

"N. basin - Brown - stain in cove area - very turbid.

② Main - Turbid - stained, turbid, < 4' SD

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Record of aquatic plant "species" observed (see note below):

- ① N. Basin - *Myriophyllum heterophyllum*, *Potamogeton epiphyllus*,
Pontederia cordata, *Eraceae*, *Scirpus*, *Wolffia*
 Main Basin (arm) - same
- ② Main - *Pontederia cordata*, *Myriophyllum heterophyllum*,
Scirpus (sparganium), *Nuphar*, *Wolffia*.
 South - *Pontederia*, *Nymphaea*, *Utricularia radiata*,
Myriophyllum heterophyllum

Trophic - Eutrophic			
Main		North	South
ALUS -	110 ac - P.S.	17 ac PS	19 ac PS
1 st Contact -	110 ac - P.S.	17 ac PS	19 ac NS
2 nd Contact -	5 acs - NS; 50 ac PS; 55 NA	17 ac PS	19 ac NS
Aesthetic -	5 acs - NS; 50 ac PS; 55 NA	17 ac PS	19 ac NS
Fish Cves.	110 NS - "	17 ac NS	19 ac NS
Causes -	110 ac Exotic (M)	17 ac Exotic (M)	19 ac Exotic (M)
	NOK, PI (M)	17 ac NOK, PI (M)	19 ac Exotic PI (M)
	Turbidity (M)	17 ac Turbidity (M)	19 acs Turbidity (M)
	110 ac Hg (M)	17 ac Hg (M)	19 ac Hg (M)

Observed aquatic plant density (at observation site and across

- ① N. Basin - 100% covered w/ dense lake or pond, if practicable):
 + submergent vegetation
- M. Basin (arm) - small cove - 75% dense veg. floating + submergent.
- ② Main - mostly open; patches of floating leaf along shores
 South - very dense over most of area (submergents)

Other notes (e.g., overt pollution, construction, and water uses:

- ① Highly developed shore
- ② Main - east + south shores developed - w. shore not
 S. Basin - 2 houses; no other development.

Herbicide treatment?

Note: record suspect *M. heterophyllum* plants that may require confirmation once emergent flowering stalks are evident.

Google Earth image of Noquochoke Lake (Main Basin), 7/2/2008 (Google Earth Pro Undated):



Google Earth image of Noquochoke Lake (Main Basin), 5/11/2016 (Google Earth Pro Undated):



Google Earth image of Noquochoke Lake (Main Basin), 8/22/2016 (Google Earth Pro Undated):



Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
<p>DMF biologists note one structure at the downstream end of Lake Noquochoke, causing passage limitation to diadromous fish between the lake and the East Branch Westport River AU below (MA95-40). The Noquochoke Lake Dam (NATID# MA01085), just upstream of Rt.6 in Westport was given a passage score of "10", on a 0-10 scale, indicating that the dam allows no possible passage of the targeted species, river herring and American eel, with a population score of "4". It was also noted that the road infrastructure at this location would create difficulties in constructing a fishway. As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, variable milfoil (<i>Myriophyllum heterophyllum</i>), in Noquochoke Lake (Main Basin) during an August 1995 synoptic survey. Additionally, MassDCR's database of non-native species observations includes a record of MassDFG Natural Heritage staff identifying swollen bladderwort (<i>Utricularia inflata</i>) in the lake.</p> <p>The Aquatic Life Use for Noquochoke Lake (MA95113) will continue to be assessed as Not Supporting, with the Non-Native Aquatic Plants impairment (for <i>Myriophyllum heterophyllum</i>) being carried forward (due to the infestation of variable milfoil) and a new impairment for the non-native aquatic macrophyte species "swollen bladderwort" being added. A new impairment will also be added for Fish Passage Barrier, based on the barrier to diadromous fish passage at the Noquochoke Lake Dam identified by DMF biologists. The Alert previously identified due to potential impacts to biota from Resolve Inc. Superfund site is also being carried forward.</p>	

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
<p>DMF biologists note one structure at the downstream end of Lake Noquochoke, causing passage limitation to diadromous fish between the lake and the East Branch Westport River AU below (MA95-40). The Noquochoke Lake Dam (NATID# MA01085), just upstream of Rt.6 in Westport was given a passage score of "10", on a 0-10 scale, indicating that the dam allows no possible passage of the targeted species, river herring and American eel, with a population score of "4". It was also noted that the road infrastructure at this location would create difficulties in constructing a fishway. The Aquatic Life Use for Lake Noquochoke (Assessment Unit MA95113) is assessed as Not Supporting, based on the barrier to diadromous fish passage at the Noquochoke Lake Dam.</p>

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995, MassDCR 2008)

Summary Statement
<p>As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, variable milfoil (<i>Myriophyllum heterophyllum</i>), in Noquochoke Lake (Main Basin) during an August 1995 synoptic survey. Additionally, MassDCR's database of non-native species observations includes a record of MassDFG Natural Heritage staff identifying swollen bladderwort (<i>Utricularia inflata</i>) in the lake.</p>

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The Fish Consumption Use for this Noquochoke Lake AU (MA95113) will continue to be assessed as Not Supporting with the Mercury in Fish Tissue and PCBs in Fish Tissue impairments being carried forward.

MA DPH advises Children under 12, pregnant women, nursing mothers, women of child-bearing age not to eat any fish from Noquochoke Lake, while the general public should not eat American Eel or Largemouth Bass and should limit consumption of other species to 2 meals/month (MassDPH 2021).

Aesthetic

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Noquochoke Lake (MA95113), so it will continue to be assessed as Not Supporting, with the Turbidity impairment being carried forward. The Aquatic Plants (Macrophytes) impairment is also being carried forward, though it is being removed as a pollutant and added back as a non-pollutant.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<i>Enterococcus</i> bacteria samples were collected from Noquochoke Lake (MA95113) by UMass Dartmouth during the summer of 2019. Overall, 16 samples were collected at the downstream end of the AU, at the Lakeside Ave boat ramp in North Dartmouth (UMassD_7). Analysis of this single years' worth of high frequency data indicated 85% of intervals had GMs >35 cfu/100ml and 31% of samples exceeded the 130 cfu/100ml STV. The Primary Contact Recreational Use for Noquochoke Lake (MA95113) will therefore continue to be assessed as Not Supporting, with the <i>Enterococcus</i> , and Turbidity impairments being carried forward. The Aquatic Plants (Macrophytes) impairment is also being carried forward, though it is being removed as a pollutant and added back as a non-pollutant.	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
UMassD_7	UMass Dartmouth	Water Quality	Noquochoke Lake	81 Lakeside Ave, N. Dartmouth, MA. Boat launch site.	41.651749	-71.042862

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (UMass-Dartmouth 2019) (MassDEP Undated4)

[Result units are CFU/100ml or MPN/100ml]

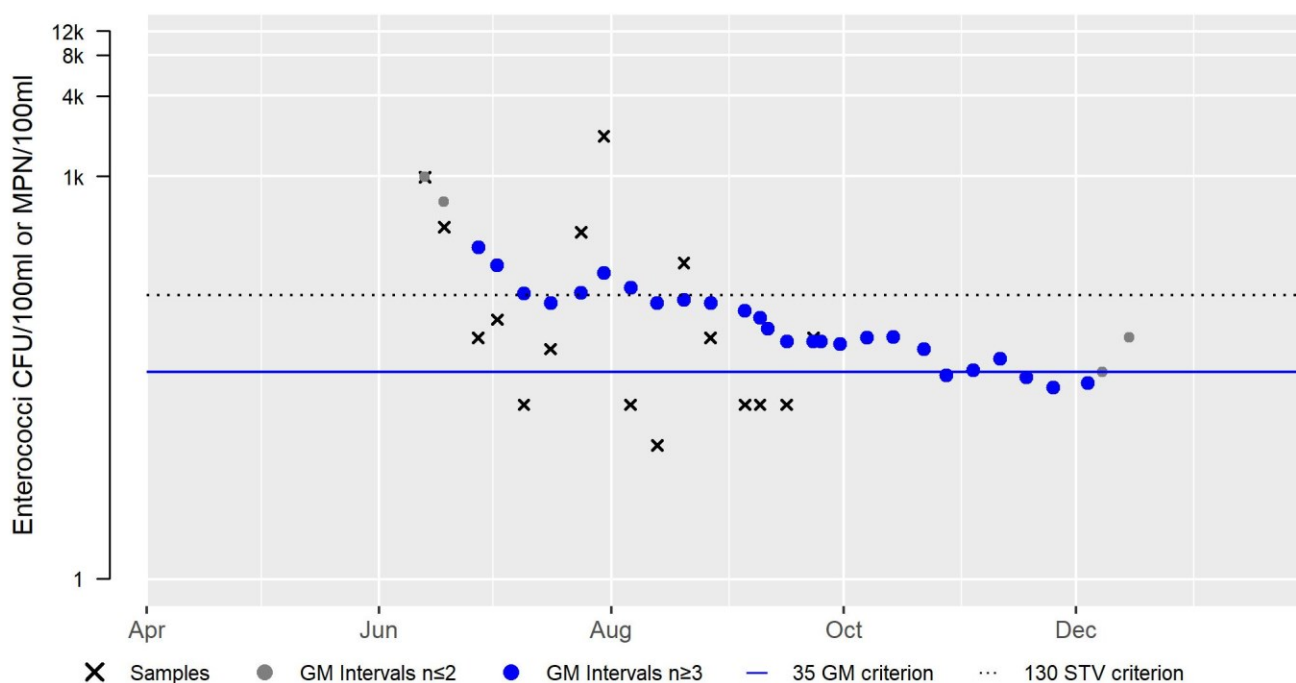
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
UMassD_7	UMass Dartmouth	Enterococci	06/13/19	09/23/19	16	10	1989	80

UMassD_7 Enterococci (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	16
SeasGM	80
#GMI	26
#GMI Ex	22
%GMI Ex	85
n>STV	5
%n>STV	31

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2019



Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No <i>E.coli</i> data are available to assess the status of the Secondary Contact Recreation Use for Noquochoke Lake (MA95113), so it will continue to be assessed as Not Supporting, with the impairment for Turbidity being carried forward. The Aquatic Plants (Macrophytes) impairment is also being carried forward, though it is being removed as a pollutant and added back as a non-pollutant.	

Noquochoke Lake (MA95170)

Location:	(South Basin) Dartmouth.
AU Type:	FRESHWATER LAKE
AU Size:	13 ACRES
Classification/Qualifier:	A: PWS, ORW (Tributary)

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Aquatic Plants (Macrophytes)*)		Changed
5	5	(Non-Native Aquatic Plants*)		Unchanged
5	5	Mercury in Fish Tissue	33880	Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Added
5	5	PCBs in Fish Tissue		Unchanged
5	5	Turbidity		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Aquatic Plants (Macrophytes)*)	Source Unknown (N)			X	X	X
(Non-Native Aquatic Plants*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
Mercury in Fish Tissue	Atmospheric Deposition - Toxics (Y)		X			
Mercury in Fish Tissue	Source Unknown (N)		X			
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)			X	X	X
PCBs in Fish Tissue	Source Unknown (N)		X			
Turbidity	Source Unknown (N)			X	X	X

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Aquatic Plants (Macrophytes)	Not caused by a pollutant (4c)	<p>As described in detail in the 2022 CALM guidance document (MassDEP 2022), the mapping of Aquatic Plants (Macrophytes) impairments as a pollutant is being reevaluated. The south basin of Noquochoke Lake (MA95170) was first listed as impaired for Noxious Aquatic Plants in 1998 and this cause was remapped to Aquatic Plants (Macrophytes) during the 2010 IR cycle (MassDEP, Integrated Listing History 1992-2014 INTLIST_HISTORY.xlsx 2015). The original impairment was based on an August 1995 synoptic survey conducted by MassDEP staff in which it was noted that submerged vegetation was very dense over most of the basin- this included the non-rooted, floating species, <i>Utricularia radiata</i> (MassDEP 1995, MassDEP 2002). Google Earth images from September 2014 and August 2016 show plant coverage over most of the basin (Google Earth Pro Undated). Nutrient/Eutrophication Biological Indicators is being added as an impairment for Noquochoke Lake (South Basin) MA95170 based on the presence of a non-rooted, floating, aquatic macrophyte species (<i>Utricularia radiata</i>). Additionally, Aquatic Plants (Macrophytes) is being delisted as a pollutant and added again as a non-pollutant since more than 25% of the lake was covered in aquatic macrophytes in recent years.</p>

Aquatic Plants (Macrophytes)

1997 WBS Coding Sheet (MassDEP 2002):

WBID: MA95170 WATERSHED: Buzzards Bay (95) (Printed 02/03/98)
 NAME: Noquochoke Lake TYPE: Lake/Pond
 CODE: 95170 SIZE: 19.00(acres) CLASS: B

LATITUDE: 0
 LONGITUDE: 0
 Lake/Pond Name: Noquochoke Lake[South Basin], Dartmouth
 Ecoregion Name: ()
 Description: Noquochoke Lake (South Basin), Dartmouth.

Assessment Date: 9704 Begin Sampling: 9508 303(d) List?: No
 Cycle: 97 End Sampling: 9508 Pathogens Only?: No

Lake Specific Information

Lake size greater than 10 acres?: Yes
 Significantly Publicly Owned: xxxx
 Trophic Status: Eutrophic
 Trophic Trend: Unknown
 Acidity/Toxics Trend: Unknown
 Acidity Effects: Unknown

Uses	Support	Threat	Partial	Non-Sup	Not-Asses	Not-Attain
OVERALL USE SUPPORT				19.00		
ALUS			19.00			
FISH CONSUMPTION				19.00		
PRIMARY CONTACT				19.00		
SECONDARY CONTACT				19.00		
Aesthetics				19.00		

Nonattainment Causes

Code	Size	Magnitude	"New" Code	Size	Magnitude
0300- Priority organics	19.00	M			
0301- (PCB's)	19.00	M			
0500- Metals	19.00	M			
0501- (Mercury)	19.00	M			
2200- Noxious aquatic plants	19.00	M			
2400- Total toxics	19.00	M			
2500- Turbidity	19.00	M			
2600- Exotic species	19.00	M			

Nonattainment Sources

Code	Size	Magnitude	"New" Code	Size	Magnitude
9000- SOURCE UNKNOWN	19.00	H			

Assessment Type

(Assessment Category = > Monitored)

B25- Ecological/habitat surveys
 (Qualitative/Quantitative)
 R35- Primary Producer Surveys
 R45- Synoptic Physical/Chemical Monitoring

"New" Assessment Category = > M E NA

Media/Pollutants Assessed

03 - Organics in fish tissue
 11 - Metals in fish tissue

(Toxics Monitoring = > Y)

"New" Toxics Monitoring = > YES or NO

Comments:

1997:

August 4, 1995 synoptic survey indicated turbidity estimated below criteria (4 feet secchi disk) and very dense submergent vegetation over the entire area. Also, the non-native species *Myriophyllum heterophyllum* was observed. Department of Public Health fish advisory due to mercury and PCBs in fish flesh.

1995 Synoptic Survey Field Sheet (MassDEP 1995):

Page 1 of 2

Lake/Pond Noguchick Lake Date 4 Aug 95

Town/City Dartmouth Observers Brodeur/McVay

River Basin Buzzards Bay

USGS Topo Fall River Post PALIS NO. Main- 95113 North 9517 South 95170

Location/type of access (be specific, e.g., public boat ramp at west cove area off Simpson Street):

① Reed Rd - Informal between N. basin + main basin

② " " " " S. " " " "

Ownership of Location/Access (specify public or private, name of owner(s), and any use restrictions):

① ? N. Basin - ?

② ?

Posted signs (re aquatic plants, fish advisories, access, etc.):

① Both basins - DPH - Fish contaminated w/ PCBs - Child, Pregnant women nursing mothers - Do Not Eat

② None

Water quality observations (clarity, dissolved organic staining, blooms, et cetera):

① "N. basin" Turbid (brown), sl stain (red) - 2-4' SD

"N. basin" - ~~Bottom~~ - swim in cove area - very turbid.

② Main - Turbid - stained, turbid, 4-5' SD

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Record of aquatic plant "species" observed (see note below):

- ① N. Basin - *Myriophyllum heterophyllum*, *Potamogeton epiphyllus*,
Pontederia cordata, *Eraceae*, *Scirpus*, *Wolffia*
 Main Basin (arm) - same
- ② Main - *Pontederia cordata*, *Myriophyllum heterophyllum*,
Scirpus (sparganium), *Nuphar*, *Wolffia*.
 South - *Pontederia*, *Nymphaea*, *Utricularia radiata*,
Myriophyllum heterophyllum

Trophic - Eutrophic			
Main		North	South
ALUS -	110 ac - P.S.	17 ac PS	19 ac PS
1 st Contact -	110 ac - P.S.	17 ac PS	19 ac NS
2 nd Contact -	5 acs - NS; 50 ac PS; 55 NA	17 ac PS	19 ac NS
Aesthetic -	5 acs - NS; 50 ac PS; 55 NA	17 ac PS	19 ac NS
Fish Cves.	110 NS - "	17 ac NS	19 ac NS
Causes -	110 ac Exotic (M)	17 ac Exotic (M)	19 ac Exotic (M)
	NOK, PI (M)	17 ac NOK, PI (M)	19 ac Exotic PI (M)
	Turbidity (M)	17 ac Turbidity (M)	19 acs Turbidity (M)
	110 ac Hg (M)	17 ac Hg (M)	19 ac Hg (M)

Observed aquatic plant density (at observation site and across

- ① N. Basin - 100% covered w/ dense lake or pond, if practicable):
 + submergent vegetation
- M. Basin (arm) - small cove - 75% dense veg. floating + submergent.
- ② Main - mostly open; patches of floating leaf along shores
 South - very dense over most of area (submergents)

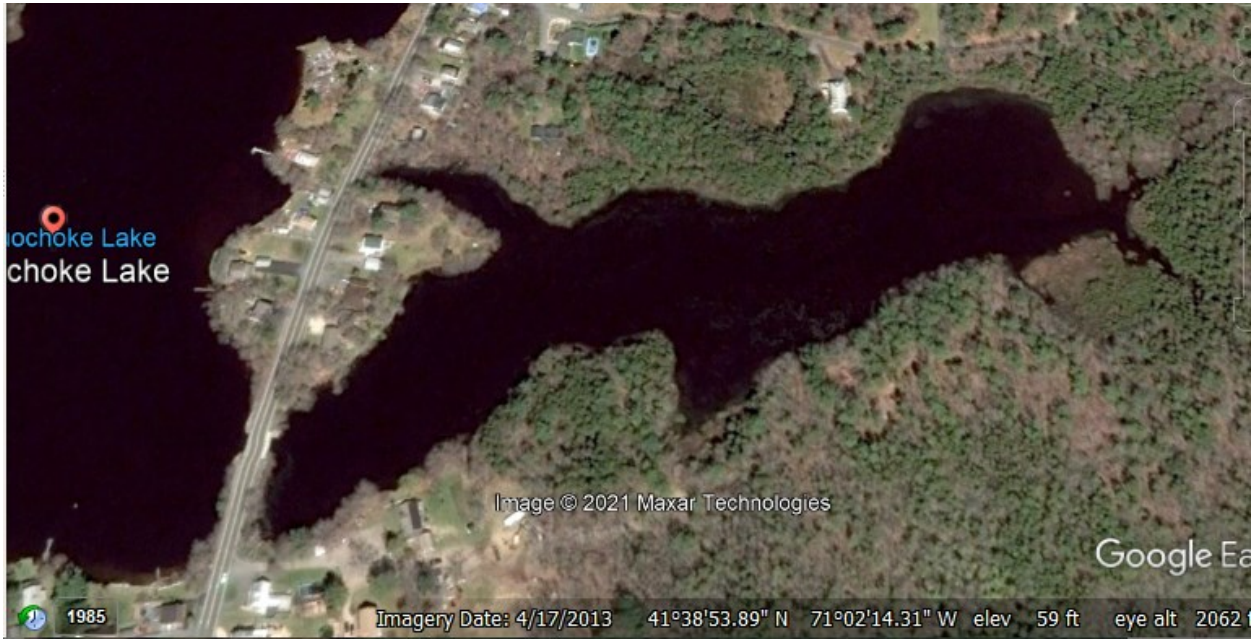
Other notes (e.g., overt pollution, construction, and water uses:

- ① Highly developed shore
- ② Main - east + south shores developed - w. shore not
 S. Basin - 2 houses; no other development.

Herbicide treatment?

Note: record suspect *M. heterophyllum* plants that may require confirmation once emergent flowering stalks are evident.

Google Earth image of Noquochoke Lake (South Basin), 4/17/2013 (Google Earth Pro Undated):



Google Earth image of Noquochoke Lake (South Basin), 9/11/2014 (Google Earth Pro Undated):



Google Earth image of Noquochoke Lake (South Basin), 8/22/2016 (Google Earth Pro Undated):



Recommendations

2022 Recommendations

ALU: Conduct an aquatic macrophyte survey of Noquochoke Lake (South Basin) (MA95170) to determine whether swollen bladderwort (*Utricularia inflata*) has infested this basin, as it has been detected in the main basin (confirmation of any non-native species should be made by a qualified state agency/taxonomist).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, variable milfoil (<i>Myriophyllum heterophyllum</i>), in Noquochoke Lake (South Basin) (MA95170) during an August 1995 synoptic survey. No data are available to assess the Aquatic Life Use for Noquochoke Lake (MA95170), so it will continue to be assessed as Not Supporting, with the impairment for Non-Native Aquatic Plants for <i>Myriophyllum heterophyllum</i> being carried forward. A new Alert is identified since swollen bladderwort (<i>Utricularia inflata</i>) has been detected in the main basin of the lake (MA95113). The Alert previously identified due to potential impacts to biota from Resolve Inc. Superfund site is also being carried forward.	

Biological Monitoring Information

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995, MassDCR 2008)

Summary Statement	Assessment Recommendation
As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, variable milfoil (<i>Myriophyllum heterophyllum</i>), in Noquochoke Lake (South Basin) during an August 1995 synoptic survey. Additionally, an Alert should be issued since swollen bladderwort (<i>Utricularia inflata</i>) has been detected in the main basin of the lake (MA95113).	Conduct an aquatic macrophyte survey of Noquochoke Lake (South Basin) to determine whether swollen bladderwort (<i>Utricularia inflata</i>) has infested this basin (as it has been detected in the main basin).

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>The Fish Consumption Use for this Noquochoke Lake AU (MA95170) will continue to be assessed as Not Supporting with the Mercury in Fish Tissue and PCBs in Fish Tissue impairments being carried forward.</p> <p>MA DPH advises Children under 12, pregnant women, nursing mothers, women of child-bearing age not to eat any fish from Noquochoke Lake, while the general public should not eat American Eel or Largemouth Bass and should limit consumption of other species to 2 meals/month (MassDPH 2021).</p>	

Aesthetic

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>No data are available to assess the status of the Aesthetic Use for Noquochoke Lake (MA95170), so it will continue to be assessed as Not Supporting, with the Turbidity impairment being carried forward. The Aquatic Plants (Macrophytes) impairment is also being carried forward, though it is being removed as a pollutant and added back as a non-pollutant. Nutrient/Eutrophication Biological Indicators is being added as an impairment for Noquochoke Lake (South Basin) MA95170 based on the presence of a non-rooted, floating, aquatic macrophyte species (<i>Utricularia radiata</i>).</p>	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>No <i>Enterococci</i> or <i>E.coli</i> data are available to assess the status of the Primary Contact Recreation Use for Noquochoke Lake (MA95170), so it will continue to be assessed as Not Supporting, with the Turbidity impairment being carried forward. The Aquatic Plants (Macrophytes) impairment is also being carried forward, though it is being removed as a pollutant and added back as a non-pollutant. Nutrient/Eutrophication Biological Indicators is being added as an impairment for Noquochoke Lake (South Basin) MA95170 based on the presence of a non-rooted, floating, aquatic macrophyte species (<i>Utricularia radiata</i>).</p>	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>No <i>E.coli</i> data are available to assess the status of the Secondary Contact Recreation Use for Noquochoke Lake (MA95170), so it will continue to be assessed as Not Supporting, with the Turbidity impairment being carried forward. The Aquatic Plants (Macrophytes) impairment is also being carried forward, though it is being removed as a pollutant and added back as a non-pollutant. Nutrient/Eutrophication Biological Indicators is being added as an impairment for Noquochoke Lake (South Basin) MA95170 based on the presence of a non-rooted, floating, aquatic macrophyte species (<i>Utricularia radiata</i>).</p>	

Noquochoke Lake (MA95171)

Location:	(North Basin) Dartmouth.
AU Type:	FRESHWATER LAKE
AU Size:	17 ACRES
Classification/Qualifier:	A: PWS, ORW (Tributary)

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Aquatic Plants (Macrophytes)*)		Changed
5	5	(Non-Native Aquatic Plants*)		Unchanged
5	5	Mercury in Fish Tissue	33880	Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Added
5	5	PCBs in Fish Tissue		Unchanged
5	5	Turbidity		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Aquatic Plants (Macrophytes)*)	Source Unknown (N)			X	X	X
(Non-Native Aquatic Plants*)	Introduction of Non-native Organisms (Accidental or Intentional) (N)	X				
Mercury in Fish Tissue	Atmospheric Deposition - Toxics (Y)		X			
Mercury in Fish Tissue	Source Unknown (N)		X			
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)			X	X	X
PCBs in Fish Tissue	Source Unknown (N)		X			
Turbidity	Source Unknown (N)			X	X	X

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Aquatic Plants (Macrophytes)	Not caused by a pollutant (4c)	<p>As described in detail in the 2022 CALM guidance document (MassDEP 2022), the mapping of Aquatic Plants (Macrophytes) impairments as a pollutant is being reevaluated. The north basin of Noquochoke Lake (MA95171) was first listed as impaired for Noxious Aquatic Plants in 1998 and this cause was remapped to Aquatic Plants (Macrophytes) during the 2010 IR cycle (MassDEP, Integrated Listing History 1992-2014 INTLIST_HISTORY.xlsx 2015). The original impairment was based on an August 1995 synoptic survey conducted by MassDEP staff in which it was noted that the basin was 100% covered with the non-rooted, floating species, <i>Lemna</i> sp., as well as submerged vegetation. <i>Wolffia</i> sp. was also noted on the species list (MassDEP 1995, MassDEP 2002). Google Earth images from September 2014 and August 2016 show high amounts of plant coverage (~≥50% coverage) (Google Earth Pro Undated). Nutrient/Eutrophication Biological Indicators is being added as an impairment for Noquochoke Lake (North Basin) MA95171 based on the presence of non-rooted, floating, aquatic macrophyte species (<i>Lemna/Wolffia</i> spp.). Additionally, Aquatic Plants (Macrophytes) is being delisted as a pollutant and added again as a non-pollutant since more than 25% of the lake was covered in aquatic macrophytes in recent years.</p>

Aquatic Plants (Macrophytes)

1997 WBS Coding Sheet (MassDEP 2002):

WBID: MA95171 WATERSHED: Buzzards Bay (95) (Printed 02/03/98)
 NAME: Noquochoke Lake TYPE: Lake/Pond
 CODE: 95171 SIZE: 17.00(acres) CLASS: B

LATITUDE: |
 LONGITUDE: | 0
 Lake/Pond Name: Noquochoke Lake[North Basin], Dartmouth
 Ecoregion Name: 0
 Description: Noquochoke Lake (North Basin), Dartmouth.

Assessment Date: 9704 Begin Sampling: 9508 303(d) List?: No
 Cycle: 97 End Sampling: 9508 Pathogens Only?: No

Lake Specific Information

Lake size greater than 10 acres?: Yes
 Significantly Publicly Owned: xxxx
 Trophic Status: Eutrophic
 Trophic Trend: Unknown
 Acidity/Toxics Trend: Unknown
 Acidity Effects: Unknown

Uses	Support	Threat	Partial	Non-Sup	Not-Asses	Not-Attain
OVERALL USE SUPPORT				17.00		
ALUS			17.00			
FISH CONSUMPTION				17.00		
PRIMARY CONTACT				17.00		
SECONDARY CONTACT				17.00		
Aesthetics				17.00		

Nonattainment Causes

Code	Size	Magnitude	"New" Code	Size	Magnitude
0300- Priority organics	17.00	M			
0301- (PCB's)	17.00	M			
0500- Metals	17.00	M			
0501- (Mercury)	17.00	M			
2200- Noxious aquatic plants	17.00	M			
2400- Total toxics	17.00	M			
2500- Turbidity	17.00	M			
2600- Exotic species	17.00	M			

Nonattainment Sources

Code	Size	Magnitude	"New" Code	Size	Magnitude
9000- SOURCE UNKNOWN	17.00	H			

Assessment Type

(Assessment Category = > Monitored)

B25- Ecological/habitat surveys
 (Qualitative/Quantitative)
 R35- Primary Producer Surveys
 R45- Synoptic Physical/Chemical Monitoring

"New" Assessment Category = > M E NA

Media/Pollutants Assessed

03 - Organics in fish tissue
 11 - Metals in fish tissue

(Toxics Monitoring = > Y)

"New" Toxics Monitoring = > YES or NO

Comments:

1997:

August 4, 1995 synoptic survey indicated turbidity estimated below criteria (<4 feet secchi disk) and very dense submergent vegetation and duckweed over the entire basin. Also, the non-native species Myriophyllum heterophyllum was observed. Department of Public Health fish advisory due to mercury and PCBs in fish flesh.

1995 Synoptic Survey Field Sheet (MassDEP 1995):

Page 1 of 2

Lake/Pond Noguchoke Lake Date 4 Aug 95

Town/City Dartmouth Observers Brodeur/McVoy

River Basin Buzzards Bay

USGS Topo Fall Line Pass PALIS NO. Main- 95113 North 9517 South 95170

Location/type of access (be specific, e.g., public boat ramp at west cove area off Simpson Street):

① Reed Rd - Informal between N. basin & main basin

② " " " " S. " " " "

Ownership of Location/Access (specify public or private, name of owner(s), and any use restrictions):

① ? N. Basin - ?

② ?

Posted signs (re aquatic plants, fish advisories, access, etc.):

① Both basins - DPH - Fish contaminated w/ PCBs - Child, Pregnant women & nursing mothers - Do Not Eat

② None

Water quality observations (clarity, dissolved organic staining, blooms, et cetera):

① "N. basin" Turbid (brown), sl stain (red) - < 4' SA

"N. basin" - Brown - scum in cove area - very turbid.

② Main - Turbid - stained, turbid, < 4' SA

Page 2 of 2

Record of aquatic plant "species" observed (see note below):

- ① N. Basin - *Myriophyllum heterophyllum*, *Potamogeton epiphyllus*,
Pontederia cordata, *Eraceae*, *Scirpus*, *Wolffia*
 Main Basin (arm) - same
- ② Main - *Pontederia cordata*, *Myriophyllum heterophyllum*,
Scirpus (sparganium), *Nuphar*, *Wolffia*.
 South - *Pontederia*, *Nymphaea*, *Utricularia radiata*,
Myriophyllum heterophyllum

Trophic - Eutrophic			
Main		North	South
ALUS -	110 ac - P.S.	17 ac PS	19 ac PS
1 st Contact -	110 ac - P.S.	17 ac PS	19 ac NS
2 nd Contact -	5 acs - NS; 50 ac PS; 55 NA	17 ac PS	19 ac NS
Aesthetic -	5 acs - NS; 50 ac PS; 55 NA	17 ac PS	19 ac NS
Fish Cves.	110 NS - "	17 ac NS	19 ac NS
Causes -	110 ac Exotic (M)	17 ac Exotic (M)	19 ac Exotic (M)
	NOK, PI (M)	17 ac NOK, PI (M)	19 ac Exotic PI (M)
	Turbidity (M)	17 ac Turbidity (M)	19 acs Turbidity (M)
	110 ac Hg (M)	17 ac Hg (M)	19 ac Hg (M)

Observed aquatic plant density (at observation site and across

- ① N. Basin - 100% covered w/ dense lake or pond, if practicable):
 + submergent vegetation
- M. Basin (arm) - small cove - 75% dense veg. floating + submergent.
- ② Main - mostly open; patches of floating leaf along shores
 South - very dense over most of area (submergents)

Other notes (e.g., overt pollution, construction, and water uses:

- ① Highly developed shore
- ② Main - east + south shores developed - w. shore not
 S. Basin - 2 houses; no other development.

Herbicide treatment?

Note: record suspect *M. heterophyllum* plants that may require confirmation once emergent flowering stalks are evident.

Google Earth image of Noquochoke Lake (North Basin), 4/17/2013 (Google Earth Pro Undated):



Google Earth image of Noquochoke Lake (North Basin), 9/11/2014 (Google Earth Pro Undated):



Google Earth image of Noquochoke Lake (North Basin), 8/22/2016 (Google Earth Pro Undated):



Recommendations

2022 Recommendations

ALU: Conduct an aquatic macrophyte survey of Noquochoke Lake (North Basin) (MA95171) to determine whether swollen bladderwort (*Utricularia inflata*) has infested this basin, as it has been detected in the main basin, (confirmation of any non-native species should be made by a qualified state agency/taxonomist).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, variable milfoil (<i>Myriophyllum heterophyllum</i>), in Noquochoke Lake (North Basin) (MA95170) during an August 1995 synoptic survey. No data are available to assess the Aquatic Life Use for Noquochoke Lake (MA95171), so it will continue to be assessed as Not Supporting, with the impairment for Non-Native Aquatic Plants for <i>Myriophyllum heterophyllum</i> being carried forward. An Alert is identified since swollen bladderwort (<i>Utricularia inflata</i>) has been detected in the main basin of the lake (MA95113).	

Biological Monitoring Information

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995, MassDCR 2008)

Summary Statement	Assessment Recommendation
As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, variable milfoil (<i>Myriophyllum heterophyllum</i>), in Noquochoke Lake (North Basin) during an August 1995 synoptic survey. Additionally, an Alert should be issued since swollen bladderwort (<i>Utricularia inflata</i>) has been detected in the main basin of the lake (MA95113).	Conduct an aquatic macrophyte survey of Noquochoke Lake (North Basin) to determine whether swollen bladderwort (<i>Utricularia inflata</i>) has infested this basin (as it has been detected in the main basin).

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
The Fish Consumption Use for this Noquochoke Lake AU (MA95171) will continue to be assessed as Not Supporting with the Mercury in Fish Tissue and PCBs in Fish Tissue impairments being carried forward. MA DPH advises Children under 12, pregnant women, nursing mothers, women of child-bearing age not to eat any fish from Noquochoke Lake, while the general public should not eat American Eel or Largemouth Bass and should limit consumption of other species to 2 meals/month (MassDPH 2021).	

Aesthetic

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Noquochoke Lake (MA95171), so it will continue to be assessed as Not Supporting, with the Turbidity impairment being carried forward. The Aquatic Plants (Macrophytes) impairment is also being carried forward, though it is being removed as a pollutant and added back as a non-pollutant. Nutrient/Eutrophication Biological Indicators is being added as an impairment for Noquochoke Lake (North Basin) MA95171 based on the presence of non-rooted, floating, aquatic macrophyte species (<i>Lemna/Wolffia</i> spp.).	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> data are available to assess the status of the Primary Contact Recreation Use for Noquochoke Lake (MA95171), so it will continue to be assessed as Not Supporting, with the Turbidity impairment being carried forward. The Aquatic Plants (Macrophytes) impairment is also being carried forward, though it is being removed as a pollutant and added back as a non-pollutant. Nutrient/Eutrophication Biological Indicators is being added as an impairment for Noquochoke Lake (North Basin) MA95171 based on the presence of non-rooted, floating, aquatic macrophyte species (<i>Lemna/Wolffia</i> spp.).	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No <i>E.coli</i> data are available to assess the status of the Secondary Contact Recreation Use for Noquochoke Lake (MA95171), so it will continue to be assessed as Not Supporting, with the Turbidity impairment being carried forward. The Aquatic Plants (Macrophytes) impairment is also being carried forward, though it is being removed as a pollutant and added back as a non-pollutant. Nutrient/Eutrophication Biological Indicators is being added as an impairment for Noquochoke Lake (North Basin) MA95171 based on the presence of non-rooted, floating, aquatic macrophyte species (<i>Lemna/Wolffia</i> spp.).	

Onset Bay (MA95-02)

Location:	Wareham.
AU Type:	ESTUARY
AU Size:	0.78 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Estuarine Bioassessments		Unchanged
5	5	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an ~47% loss of eelgrass bed habitat in Onset Bay between 1995 and 2017, with the greatest extent of loss occurring inside of Onset Island. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at nine locations in Onset Bay, Wareham (MA95-02) in the summers of 2015-2019, from inner to outer as follows; BBC_OB3A, OB3 (from docks at the inner end of the AU), BBC_OB1 (from a dock off Onset Beach). BBC_OB6 (north-west off Wickets Island), BBC_OB7 (a south bank dock) and BBC_OB2 (a north bank dock) both between Wickets & Onset Islands, BBC_OB8 (just offshore from Nanumett Beach), BBC_OB9 (a dock off the west bank of Onset Island), and BBC_OB10 (mid-channel at the outer edge of the AU). Monitoring was conducted in the surface waters at all locations as well as deeper in the water column at some (0.7-2.9m) and typically was done weekly (between the hours of 6 and 9am). The maximum temperature was 28.5°C (n=541). The minimum dissolved oxygen (DO) was 3.0mg/L at BBC_OB1 in 2018 (n=518), however concentrations this low were rare (<6.0mg/L only 10 times --~2% of all measurements and <5.0mg/L only three times). Total nitrogen sampling (ebb tides in June – September, n=40) documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.21 and 0.28mg/L. It should be noted that although the maximum total nitrogen concentration was 0.48mg/L (at BBC_OB1 in 2017), this was the only time that a concentration >0.4mg/L was documented. The maximum chlorophyll *a* was 8.92µg/L (n=134), >5µg/L 18 times and Secchi disk depths ranged from 1.1 to 3.9m. Ammonia-nitrogen concentrations ranged from 0.004 to 0.04mg/L (n=134), though TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for Onset Bay (MA95-02) will continue to be assessed as Not Supporting based on the loss of Eelgrass Bed habitat documented by the MassDEP Eelgrass Mapping Project between 1995 and 2017 so the Estuarine Bioassessment impairment is being carried forward. Water quality monitoring data collected by BBC between 2015 and 2019 were otherwise indicative of generally good conditions.

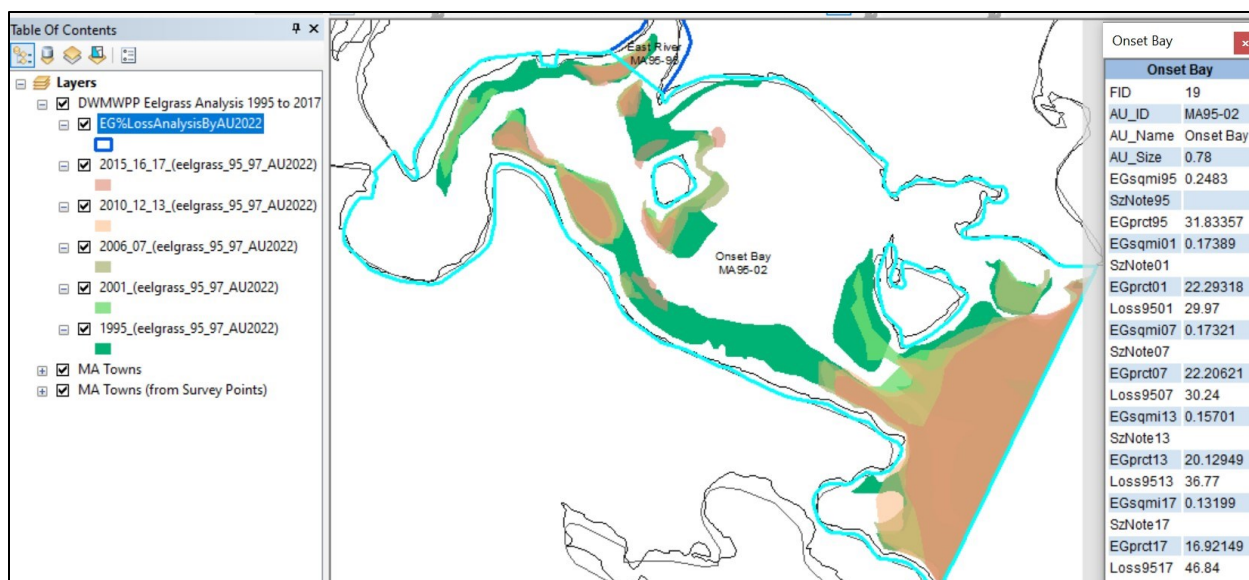
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_OB1	Buzzards Bay Coalition	Water Quality	Onset Bay	Onset Bay Inner, Wareham	41.740892	-70.659368
BBC_OB10	Buzzards Bay Coalition	Water Quality	Onset Bay	Onset Bay Outer, Wareham	41.731196	-70.641213
BBC_OB2	Buzzards Bay Coalition	Water Quality	Onset Bay	Onset Bay Outer, Wareham	41.738223	-70.64778
BBC_OB3	Buzzards Bay Coalition	Water Quality	Onset Bay	Onset Bay Inner, Wareham	41.734355	-70.664112
BBC_OB3A	Buzzards Bay Coalition	Water Quality	Onset Bay	Onset Bay Inner, Wareham	41.734777	-70.665905
BBC_OB6	Buzzards Bay Coalition	Water Quality	Onset Bay	Onset Bay Inner, Wareham	41.73877	-70.652306
BBC_OB7	Buzzards Bay Coalition	Water Quality	Onset Bay	Onset Bay Outer, Wareham	41.732841	-70.653211
BBC_OB8	Buzzards Bay Coalition	Water Quality	Onset Bay	Onset Bay Outer, Wareham	41.737248	-70.645568
BBC_OB9	Buzzards Bay Coalition	Water Quality	Onset Bay	Onset Bay Outer, Wareham	41.734026	-70.645207

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Onset Bay MA95-02 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~47% loss of eelgrass bed habitat in Onset Bay between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_OB1	06/09/15	09/15/15	0.4	14	6.8	8.1	0	0	0
BBC_OB1	06/09/15	09/15/15	2.9	14	6.8	8.4	0	0	0
BBC_OB1	03/08/16	09/26/16	0.2	22	6.3	8.1	0	0	0
BBC_OB1	05/31/16	09/26/16	2.7	20	4.0	7.7	5	5	0
BBC_OB1	01/09/17	09/19/17	0.2	23	5.0	7.4	13	0	0
BBC_OB1	05/30/17	09/17/17	2.7	19	5.0	7.2	5	0	0
BBC_OB1	06/05/18	09/18/18	0.2	13	5.5	6.8	8	0	0
BBC_OB1	05/29/18	09/18/18	2.7	17	3.0	7.1	6	6	6
BBC_OB1	05/31/19	08/27/19	0.2	14	7.5	8.4	0	0	0
BBC_OB1	05/31/19	08/27/19	2.7	17	7.5	9.1	0	0	0
BBC_OB10	09/05/18	10/18/18	0.2	4	6.8	7.8	0	0	0
BBC_OB10	05/28/19	10/22/19	0.2	12	7.0	8.3	0	0	0
BBC_OB2	05/28/15	09/23/15	0.2	22	6.5	7.7	0	0	0
BBC_OB2	05/28/15	09/23/15	2.5	22	7.0	7.9	0	0	0
BBC_OB2	05/31/16	09/24/16	0.2	22	7.0	7.5	0	0	0
BBC_OB2	05/31/16	09/24/16	2.4	23	7.0	7.5	0	0	0
BBC_OB2	05/31/17	09/19/17	0.2	22	6.5	7.1	0	0	0
BBC_OB2	05/31/17	09/19/17	2.4	22	6.5	7.1	0	0	0
BBC_OB2	05/30/18	09/19/18	0.2	22	7.0	7.8	0	0	0
BBC_OB2	05/30/18	09/19/18	2.4	23	7.5	8.0	0	0	0
BBC_OB2	05/30/19	09/23/19	0.2	20	7.5	7.8	0	0	0
BBC_OB2	05/30/19	09/23/19	2.4	20	7.5	7.9	0	0	0
BBC_OB3A	06/17/15	09/19/15	0.7	14	5.0	7.4	14	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_OB3A	06/17/16	09/17/16	0.7	13	6.0	6.7	0	0	0
BBC_OB3A	06/22/17	08/21/17	0.3	4	6.0	6.8	0	0	0
BBC_OB3A	06/18/17	09/16/17	0.7	16	6.0	6.8	0	0	0
BBC_OB3A	05/29/18	09/11/18	0.2	6	6.5	7.3	0	0	0
BBC_OB3A	05/29/18	09/18/18	0.8	14	6.5	7.4	0	0	0
BBC_OB3A	05/31/19	09/13/19	0.2	14	7.0	8.0	0	0	0
BBC_OB3A	05/31/19	09/13/19	0.9	16	6.5	7.8	0	0	0
BBC_OB8	07/24/18	07/24/18	0.2	1	6.9	6.9	0	0	0
BBC_OB8	07/11/19	07/11/19	0.2	1	7.7	7.7	0	0	0
BBC_OB9	06/16/15	09/24/15	0.2	4	6.7	7.4	0	0	0
BBC_OB9	06/01/16	09/26/16	0.2	4	5.5	7.2	25	0	0
BBC_OB9	01/09/17	09/18/17	0.2	4	7.3	9.1	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_OB1	06/03/15	09/24/15	0.2	20	19	24.0	20.3	0
BBC_OB1	06/03/15	09/15/15	2.8	17	17	24.0	19.6	0
BBC_OB1	01/06/16	09/26/16	0.2	25	19	24.0	20.1	0
BBC_OB1	05/31/16	09/26/16	2.6	20	16	25.0	19.5	0
BBC_OB1	01/09/17	09/19/17	0.2	23	19	22.9	19.4	0
BBC_OB1	05/30/17	09/17/17	2.7	18	16	22.6	18.3	0
BBC_OB1	05/29/18	09/18/18	0.2	17	14	24.0	20.7	0
BBC_OB1	05/29/18	09/18/18	2.7	17	14	22.3	19.2	0
BBC_OB1	05/31/19	08/27/19	0.2	15	14	24.9	21.1	0
BBC_OB1	05/31/19	08/27/19	2.6	17	16	22.5	19.4	0
BBC_OB10	08/10/15	08/10/15	0.2	1	1	20.0	20.0	0
BBC_OB10	07/05/16	08/15/16	0.2	3	3	22.0	21.3	0
BBC_OB10	07/06/17	08/17/17	0.2	2	2	20.0	19.5	0
BBC_OB10	07/10/18	10/18/18	0.2	7	5	26.0	23.2	0
BBC_OB10	05/28/19	10/22/19	0.2	14	8	22.0	20.6	0
BBC_OB2	05/28/15	09/23/15	0.2	22	19	25.0	20.8	0
BBC_OB2	05/28/15	09/23/15	2.5	22	19	23.0	19.4	0
BBC_OB2	05/31/16	09/24/16	0.2	22	18	25.0	21.7	0
BBC_OB2	05/31/16	09/24/16	2.4	22	18	25.0	21.0	0
BBC_OB2	05/31/17	09/19/17	0.2	22	19	24.0	20.9	0
BBC_OB2	05/31/17	09/19/17	2.3	22	19	23.0	19.7	0
BBC_OB2	05/30/18	09/19/18	0.2	22	20	25.0	21.8	0
BBC_OB2	05/30/18	09/19/18	2.4	22	20	24.0	20.6	0
BBC_OB2	05/30/19	09/23/19	0.2	20	17	25.0	21.4	0
BBC_OB2	05/30/19	09/23/19	2.4	20	17	24.0	20.6	0
BBC_OB3	07/27/15	08/10/15	0.2	2	2	25.0	22.5	0
BBC_OB3	08/10/15	08/10/15	2.7	1	1	20.0	20.0	0
BBC_OB3	07/05/16	08/15/16	0.2	3	3	24.0	22.7	0
BBC_OB3	07/05/16	08/15/16	2.8	3	3	23.0	21.7	0
BBC_OB3	07/06/17	08/17/17	0.2	2	2	22.0	21.0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_OB3	07/06/17	08/17/17	2.9	2	2	20.0	19.5	0
BBC_OB3	07/10/18	08/21/18	0.2	3	3	28.0	25.0	0
BBC_OB3	07/10/18	08/21/18	2.7	3	3	25.0	23.0	0
BBC_OB3	07/25/19	08/15/19	0.2	2	2	22.0	21.5	0
BBC_OB3A	06/17/15	09/19/15	0.7	13	12	26.0	21.6	0
BBC_OB3A	06/17/16	09/17/16	0.7	13	12	24.0	20.7	0
BBC_OB3A	06/22/17	08/21/17	0.3	4	4	21.0	19.8	0
BBC_OB3A	06/18/17	09/16/17	0.8	15	14	21.0	19.0	0
BBC_OB3A	05/29/18	09/11/18	0.2	6	5	25.0	20.8	0
BBC_OB3A	05/29/18	09/18/18	0.8	14	12	25.0	21.3	0
BBC_OB3A	05/31/19	09/13/19	0.2	14	13	24.0	19.7	0
BBC_OB3A	05/31/19	09/13/19	0.9	16	15	24.0	20.3	0
BBC_OB6	07/27/15	08/10/15	0.2	2	2	25.0	22.5	0
BBC_OB6	07/05/16	08/15/16	0.2	3	3	24.0	22.7	0
BBC_OB6	07/06/17	08/17/17	0.2	2	2	20.0	20.0	0
BBC_OB6	07/10/18	08/21/18	0.2	3	3	27.0	24.3	0
BBC_OB6	07/25/19	08/15/19	0.2	2	2	22.0	21.0	0
BBC_OB7	07/27/15	08/10/15	0.2	2	2	25.0	22.5	0
BBC_OB7	07/05/16	08/15/16	0.2	3	3	23.0	21.7	0
BBC_OB7	07/06/17	08/17/17	0.2	2	2	20.0	20.0	0
BBC_OB7	07/10/18	08/21/18	0.2	3	3	27.0	23.5	0
BBC_OB7	07/25/19	08/15/19	0.2	2	2	21.0	20.5	0
BBC_OB8	08/10/15	08/10/15	0.2	1	1	20.0	20.0	0
BBC_OB8	08/10/15	08/10/15	1.6	1	1	20.0	20.0	0
BBC_OB8	07/05/16	08/15/16	0.2	3	3	23.0	22.0	0
BBC_OB8	07/05/16	08/15/16	2.6	3	3	23.0	21.7	0
BBC_OB8	07/06/17	08/17/17	0.2	2	2	20.0	20.0	0
BBC_OB8	07/06/17	08/17/17	1.8	2	2	20.0	19.5	0
BBC_OB8	07/10/18	08/21/18	0.2	4	4	27.5	23.7	0
BBC_OB8	07/10/18	08/21/18	2.3	3	3	28.5	24.2	0
BBC_OB8	07/11/19	08/15/19	0.2	3	3	22.9	21.5	0
BBC_OB9	06/16/15	09/24/15	0.2	5	4	22.4	19.3	0
BBC_OB9	01/06/16	09/26/16	0.2	9	6	23.0	20.0	0
BBC_OB9	01/09/17	09/18/17	0.2	6	3	20.0	17.3	0
BBC_OB9	07/10/18	08/21/18	0.2	3	3	28.0	23.5	0
BBC_OB9	07/25/19	08/15/19	0.2	2	2	21.0	20.5	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_OB1	2015	0.2	3	0.22	0.33	0.28	4	3.31	8.92	6.45	2	0
BBC_OB1	2016	0.2	3	0.24	0.26	0.25	6	0.98	2.89	1.93	6	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_OB1	2017	0.2	2	0.35	0.48	0.41	6	2.14	4.51	3.42	6	0
BBC_OB10	2015	0.2	1	0.27	0.27	0.27	1	2.21	2.21	2.21	1	0
BBC_OB10	2016	0.2	--	--	--	--	3	2.04	3.28	2.65	3	0
BBC_OB10	2017	0.2	--	--	--	--	2	2.96	3.19	3.08	2	0
BBC_OB10	2018	0.2	2	0.24	0.24	0.24	7	0.96	3.52	2.42	7	0
BBC_OB10	2019	0.2	2	0.31	0.35	0.33	13	1.12	7.22	3.84	10	0
BBC_OB3	2015	0.2	2	0.23	0.29	0.26	2	4.20	7.24	5.72	1	0
BBC_OB3	2015	2.7	1	0.35	0.35	0.35	1	7.19	7.19	7.19	0	0
BBC_OB3	2016	0.2	--	--	--	--	3	2.70	3.65	3.28	3	0
BBC_OB3	2016	2.8	--	--	--	--	3	4.12	4.91	4.46	3	0
BBC_OB3	2017	0.2	--	--	--	--	2	3.90	4.52	4.21	2	0
BBC_OB3	2017	2.8	1	0.36	0.36	0.36	2	4.18	4.51	4.35	2	0
BBC_OB3	2018	0.2	1	0.34	0.34	0.34	3	4.21	5.39	4.62	2	0
BBC_OB3	2018	2.7	2	0.35	0.38	0.36	3	3.81	5.58	4.65	2	0
BBC_OB3	2019	0.2	--	--	--	--	2	0.16	5.60	2.88	1	0
BBC_OB6	2015	0.2	2	0.27	0.36	0.32	2	4.98	8.80	6.89	1	0
BBC_OB6	2016	0.2	1	0.31	0.31	0.31	3	2.57	3.08	2.90	3	0
BBC_OB6	2017	0.2	1	0.34	0.34	0.34	2	3.68	5.04	4.36	2	0
BBC_OB6	2018	0.2	1	0.32	0.32	0.32	3	4.05	5.97	4.91	2	0
BBC_OB6	2019	0.2	--	--	--	--	2	0.40	3.70	2.05	2	0
BBC_OB7	2015	0.2	1	0.25	0.25	0.25	2	3.14	5.13	4.14	1	0
BBC_OB7	2016	0.2	--	--	--	--	3	2.48	3.32	2.98	3	0
BBC_OB7	2017	0.2	--	--	--	--	2	3.22	3.34	3.28	2	0
BBC_OB7	2018	0.2	1	0.29	0.29	0.29	3	3.57	3.99	3.78	3	0
BBC_OB7	2019	0.2	--	--	--	--	2	3.52	4.64	4.08	2	0
BBC_OB8	2015	0.2	--	--	--	--	1	2.86	2.86	2.86	1	0
BBC_OB8	2015	1.6	--	--	--	--	1	3.56	3.56	3.56	1	0
BBC_OB8	2016	0.2	--	--	--	--	3	2.57	3.18	2.95	3	0
BBC_OB8	2016	2.7	1	0.27	0.27	0.27	3	2.20	2.93	2.62	3	0
BBC_OB8	2017	0.2	1	0.31	0.31	0.31	2	3.05	3.77	3.41	2	0
BBC_OB8	2017	1.7	1	0.35	0.35	0.35	2	2.34	3.82	3.08	2	0
BBC_OB8	2018	0.2	2	0.25	0.27	0.26	4	2.93	4.23	3.64	4	0
BBC_OB8	2018	2.5	2	0.28	0.32	0.30	3	3.22	4.10	3.76	3	0
BBC_OB8	2019	0.2	--	--	--	--	3	3.63	5.45	4.58	2	0
BBC_OB9	2015	0.2	3	0.19	0.23	0.21	5	2.49	8.12	4.27	3	0
BBC_OB9	2016	0.2	1	0.18	0.18	0.18	9	0.76	3.44	2.03	9	0
BBC_OB9	2017	0.2	1	0.35	0.35	0.35	6	2.29	5.71	3.52	5	0
BBC_OB9	2018	0.2	1	0.29	0.29	0.29	3	2.81	3.37	3.02	3	0
BBC_OB9	2019	0.2	--	--	--	--	2	3.94	5.54	4.74	1	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_OB1	06/03/15	09/24/15	19	1.8	2.7	2.2
BBC_OB1	03/08/16	09/24/16	23	1.3	3.9	2.3
BBC_OB1	03/08/17	09/19/17	23	1.5	3.3	2.4
BBC_OB1	05/29/18	09/18/18	18	1.7	3.1	2.3
BBC_OB1	05/31/19	08/27/19	17	2.0	3.5	2.6
BBC_OB10	08/21/18	08/21/18	1	1.6	1.6	1.6
BBC_OB10	06/26/19	07/10/19	2	2.5	3.0	2.8
BBC_OB2	05/28/15	09/23/15	15	1.7	2.9	2.3
BBC_OB2	06/06/16	09/16/16	17	1.7	2.8	2.2
BBC_OB2	06/07/17	09/19/17	15	1.4	2.9	2.1
BBC_OB2	05/30/18	09/10/18	18	1.7	2.5	2.2
BBC_OB2	06/14/19	09/18/19	15	1.8	3.0	2.2
BBC_OB3	07/27/15	08/10/15	2	1.5	2.6	2.1
BBC_OB3	07/05/16	08/15/16	3	1.8	2.0	1.9
BBC_OB3	07/06/17	08/17/17	2	2.1	2.1	2.1
BBC_OB3	07/10/18	08/21/18	3	1.8	1.8	1.8
BBC_OB3	07/25/19	08/15/19	2	2.2	2.6	2.4
BBC_OB3A	07/31/15	07/31/15	1	1.1	1.1	1.1
BBC_OB6	07/27/15	08/10/15	2	1.5	2.2	1.9
BBC_OB6	07/05/16	08/15/16	3	1.8	2.1	2.0
BBC_OB6	07/06/17	07/06/17	1	1.7	1.7	1.7
BBC_OB6	07/10/18	08/07/18	2	1.6	1.8	1.7
BBC_OB6	07/25/19	08/15/19	2	1.9	2.3	2.1
BBC_OB7	07/27/15	07/27/15	1	1.5	1.5	1.5
BBC_OB7	07/05/16	08/15/16	2	2.0	2.0	2.0
BBC_OB7	07/06/17	08/17/17	2	2.0	2.0	2.0
BBC_OB7	07/10/18	08/21/18	3	1.8	2.1	1.9
BBC_OB8	07/05/16	08/15/16	3	2.0	2.5	2.2
BBC_OB8	07/10/18	08/21/18	2	1.9	2.4	2.1
BBC_OB8	07/25/19	08/15/19	2	2.5	2.8	2.7
BBC_OB9	06/01/16	08/15/16	4	1.9	2.5	2.1
BBC_OB9	01/09/17	03/08/17	2	1.8	2.9	2.3
BBC_OB9	08/07/18	08/07/18	1	2.3	2.3	2.3
BBC_OB9	08/15/19	08/15/19	1	2.1	2.1	2.1

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_OB1	06/16/15	09/24/15	0.2	4	0.004	0.030	0.015
BBC_OB1	01/06/16	09/26/16	0.2	6	0.004	0.021	0.011
BBC_OB1	01/09/17	09/19/17	0.2	6	0.004	0.014	0.009
BBC_OB10	08/10/15	08/10/15	0.2	1	0.012	0.012	0.012

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_OB10	07/05/16	08/15/16	0.2	3	0.005	0.007	0.006
BBC_OB10	07/06/17	08/17/17	0.2	2	0.004	0.006	0.005
BBC_OB10	07/10/18	10/18/18	0.2	7	0.004	0.025	0.012
BBC_OB10	05/28/19	10/22/19	0.2	13	0.004	0.043	0.010
BBC_OB3	07/27/15	08/10/15	0.2	2	0.005	0.016	0.011
BBC_OB3	08/10/15	08/10/15	2.7	1	0.014	0.014	0.014
BBC_OB3	07/05/16	08/15/16	0.2	3	0.006	0.008	0.008
BBC_OB3	07/05/16	08/15/16	2.8	3	0.006	0.014	0.010
BBC_OB3	07/06/17	08/17/17	0.2	2	0.004	0.006	0.005
BBC_OB3	07/06/17	08/17/17	2.9	2	0.004	0.013	0.009
BBC_OB3	07/10/18	08/21/18	0.2	3	0.004	0.008	0.006
BBC_OB3	07/10/18	08/21/18	2.7	3	0.004	0.011	0.007
BBC_OB3	07/25/19	08/15/19	0.2	2	0.004	0.004	0.004
BBC_OB6	07/27/15	08/10/15	0.2	2	0.006	0.015	0.011
BBC_OB6	07/05/16	08/15/16	0.2	3	0.004	0.009	0.006
BBC_OB6	07/06/17	08/17/17	0.2	2	0.004	0.007	0.006
BBC_OB6	07/10/18	08/21/18	0.2	3	0.004	0.009	0.006
BBC_OB6	07/25/19	08/15/19	0.2	2	0.004	0.005	0.004
BBC_OB7	07/27/15	08/10/15	0.2	2	0.005	0.008	0.007
BBC_OB7	07/05/16	08/15/16	0.2	3	0.004	0.005	0.004
BBC_OB7	07/06/17	08/17/17	0.2	2	0.004	0.005	0.004
BBC_OB7	07/10/18	08/21/18	0.2	3	0.004	0.005	0.005
BBC_OB7	07/25/19	08/15/19	0.2	2	0.004	0.006	0.005
BBC_OB8	08/10/15	08/10/15	0.2	1	0.013	0.013	0.013
BBC_OB8	08/10/15	08/10/15	1.6	1	0.011	0.011	0.011
BBC_OB8	07/05/16	08/15/16	0.2	3	0.005	0.009	0.007
BBC_OB8	07/05/16	08/15/16	2.6	3	0.014	0.016	0.015
BBC_OB8	07/06/17	08/17/17	0.2	2	0.004	0.007	0.006
BBC_OB8	07/06/17	08/17/17	1.8	2	0.006	0.016	0.011
BBC_OB8	07/10/18	08/21/18	0.2	4	0.004	0.012	0.007
BBC_OB8	07/10/18	08/21/18	2.3	3	0.004	0.044	0.018
BBC_OB8	07/11/19	08/15/19	0.2	3	0.004	0.004	0.004
BBC_OB9	06/16/15	09/24/15	0.2	5	0.004	0.018	0.011
BBC_OB9	01/06/16	09/26/16	0.2	9	0.004	0.020	0.008
BBC_OB9	01/09/17	09/18/17	0.2	6	0.004	0.007	0.005
BBC_OB9	07/10/18	08/21/18	0.2	3	0.004	0.015	0.008
BBC_OB9	07/25/19	08/15/19	0.2	2	0.004	0.006	0.005

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Onset Bay (MA95-02); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Onset Bay (MA95-02): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.74 sq mi (95%). The approved shellfish growing area represents 0.5112 sq mi (66%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB40.0	Onset Bay	Approved	0.51124	65.7%
BB40.3	Town Pier Mooring Area	Conditionally Approved	0.07351	9.4%
BB40.5	Onset Bay	Prohibited	0.00022	0.0%
BB40.6	Eastern Side of Onset Bay Mooring Area	Conditionally Approved	0.15415	19.8%
BB41.0	Sunset Cove	Conditionally Approved	0.00089	0.1%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Onset Bay (MA95-02) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There are two beaches in Onset Bay, Wareham (MA95-02), the names and ID codes for the beaches are as follows: Onset (ID 3184) and Point Independence (ID 3180). These beaches were rarely posted with any swimming advisories between 2014 and 2019. The Primary Contact Recreational Use for Onset Bay (MA95-02) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the Onset and Point Independence Beaches between 2014 and 2019.	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
3180	Point Independence/Wareham	41.74049	-70.65200	41.74059	-70.64860	2%	0%	0%	0%	0%	0%	0
3184	Onset/Wareham	41.73845	-70.66390	41.74233	-70.65410	2%	0%	0%	0%	0%	0%	0

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Onset Bay (MA95-02): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.74 sq mi (95%). The approved shellfish growing area represents 0.5112 sq mi (66%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There are two beaches in Onset Bay, Wareham (MA95-02), the names and ID codes for the beaches are as follows: Onset (ID 3184) and Point Independence (ID 3180). These beaches were rarely posted with any swimming advisories between 2014 and 2019. The Secondary Contact Recreational Use for Onset Bay (MA95-02) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the Onset and Point Independence Beaches between 2014 and 2019.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Onset Bay (MA95-02): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.74 sq mi (95%). The approved shellfish growing area represents 0.5112 sq mi (66%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Outer New Bedford Harbor (MA95-63)

Location:	From the hurricane barrier, Fairhaven/New Bedford to a line drawn from Wilbur Point, Fairhaven to Clarks Point, New Bedford (formerly part of 2000 segment: Outer New Bedford Harbor MA95-27).
AU Type:	ESTUARY
AU Size:	5.78 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Dissolved Oxygen		Unchanged
5	5	Enterococcus	36172	Unchanged
5	5	Fecal Coliform	36172	Unchanged
5	5	Metals		Removed
5	5	Nitrogen, Total		Unchanged
5	5	Other Organics		Removed
5	5	PCBs in Fish Tissue		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Combined Sewer Overflows (Y)	X					
Dissolved Oxygen	Industrial Point Source Discharge (N)	X					
Dissolved Oxygen	Municipal Point Source Discharges (N)	X					
Dissolved Oxygen	Unspecified Urban Stormwater (N)	X					
Enterococcus	Combined Sewer Overflows (Y)					X	X
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Source Unknown (N)	X					
PCBs in Fish Tissue	CERCLA NPL (Superfund) Sites (Y)		X				
PCBs in Fish Tissue	Contaminated Sediments (Y)		X				

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Other Organics	Applicable WQS attained, due to restoration activities	The original cause “Other” was related to unspecified metals and non-priority organics as part of the 1992 listing cycle. The documentation of that decision is poor but linked to both the facility planning process to upgrade the New Bedford POTW to secondary treatment and the feasibility studies to evaluate the impact of the New Bedford Harbor Superfund Site Cleanup Project. This original “Other” impairment was remapped to “Other Organics” in the 2016 IR cycle as part of the transition to the ATAINS database. Since the New Bedford WWTP has since been upgraded, all recent indicators collected by EPA as part of the long-term monitoring project associated with the New Bedford Harbor Cleanup (benthic, eelgrass, and sediment PCB concentrations) suggest good water quality and habitat conditions in the Outer New Bedford Harbor (Bergen 2015), and the water quality data collected by BBC staff/volunteers in the summers of 2014-2019 the “Other Organics” cause is being removed.
Metals	Applicable WQS attained, due to restoration activities	The original cause “Metals” was related to unspecified metals as part of the 1992 listing cycle. The documentation of that decision is poor but linked to both the facility planning process to upgrade the New Bedford POTW to secondary treatment and the feasibility studies to evaluate the impact of the New Bedford Harbor Superfund Site Cleanup Project. Since the New Bedford WWTP has since been upgraded and all recent indicators collected by EPA as part of the long-term monitoring project associated with the New Bedford Harbor Cleanup (benthic, eelgrass, and sediment PCB concentrations) suggest good water quality and habitat conditions in the Outer New Bedford Harbor (Bergen 2015) the “Metals” cause is being removed.

Other Organics

Graphics depicting summary of New Bedford Harbor Long-Term Monitoring Data Outer New Bedford Harbor area indicating good biological habitat conditions (Bergen 2015):

Figure 6: Values of the EMAP benthic index for each of the outer harbor long-term monitoring stations in 2009 (a) and 2014 (b). <http://www.epa.gov/sites/production/files/2015-09/documents/583616.pdf>

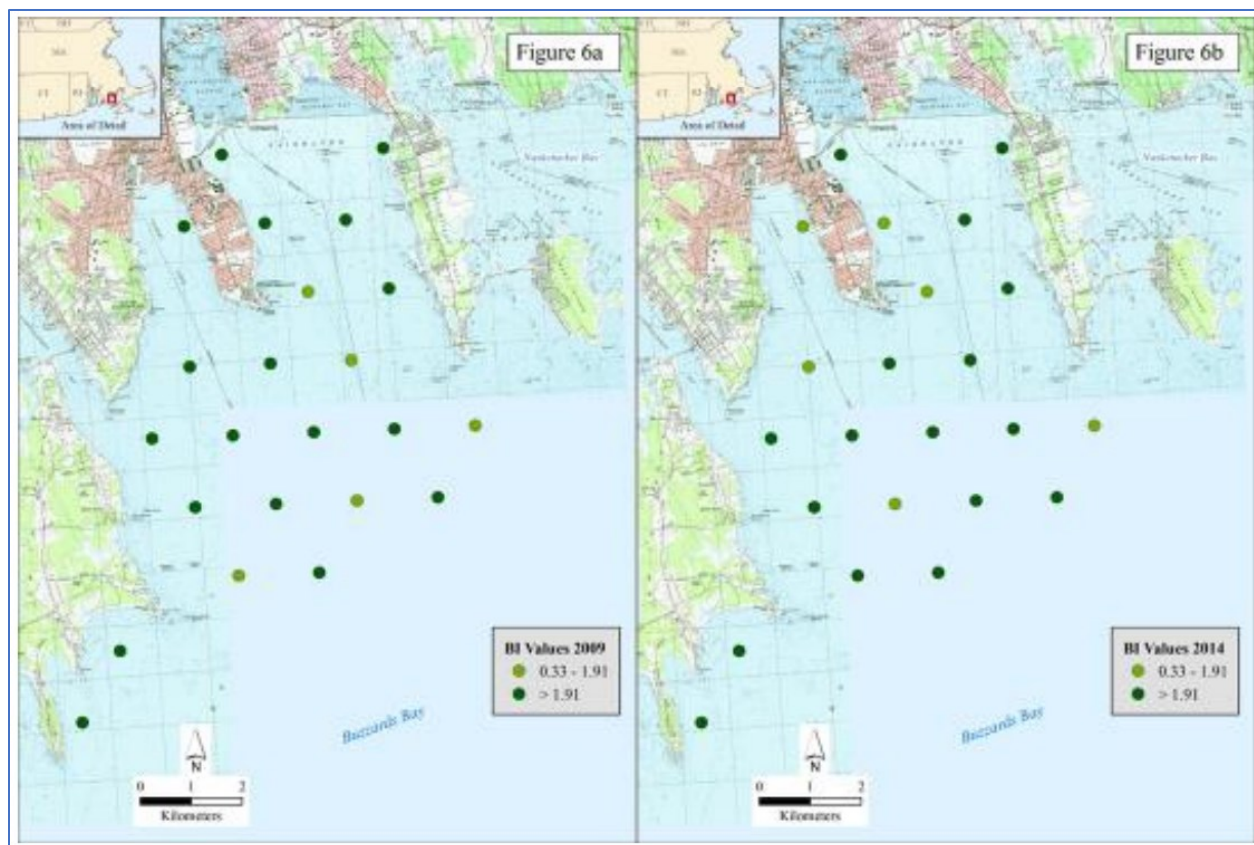


Figure 7

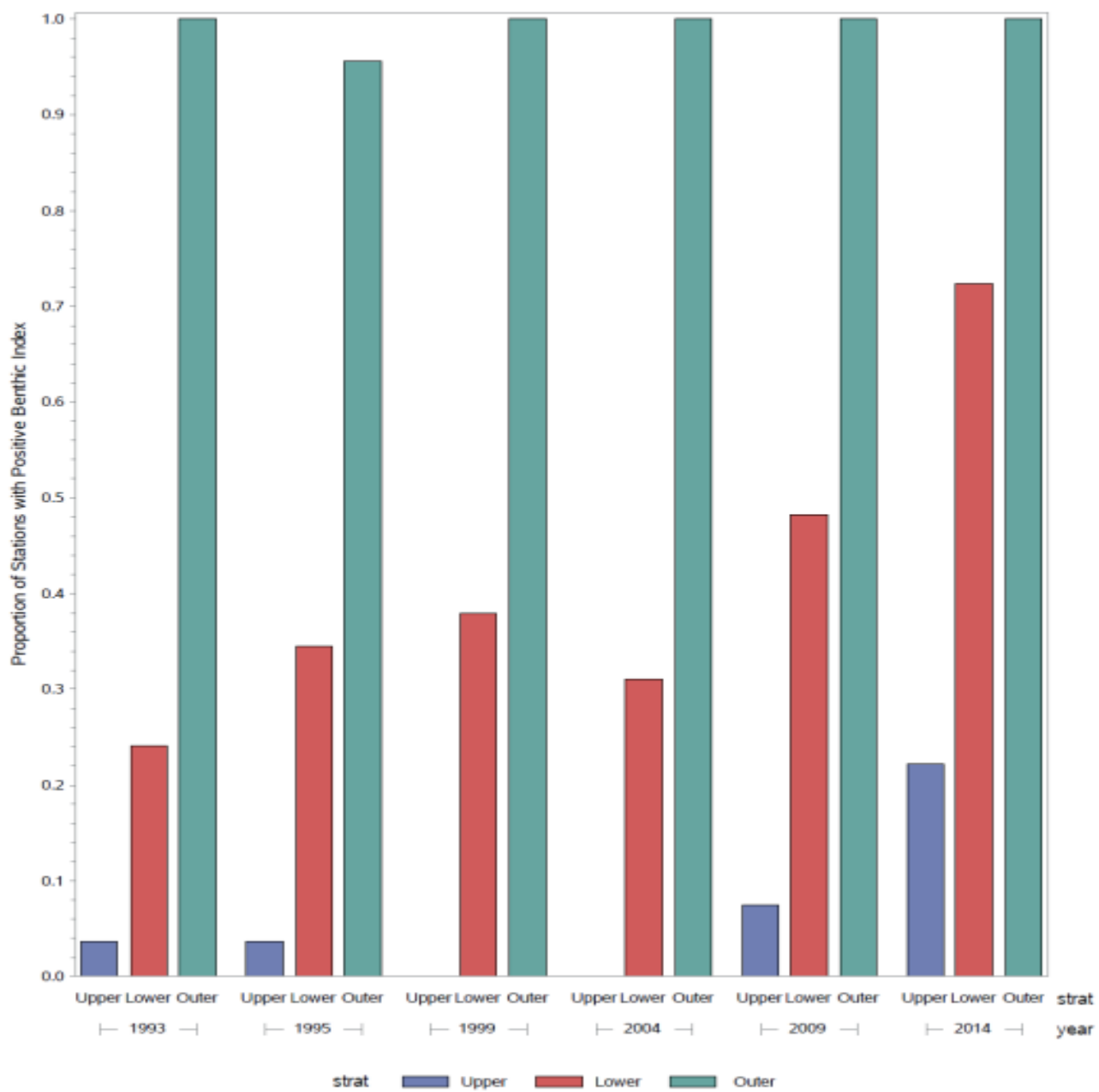
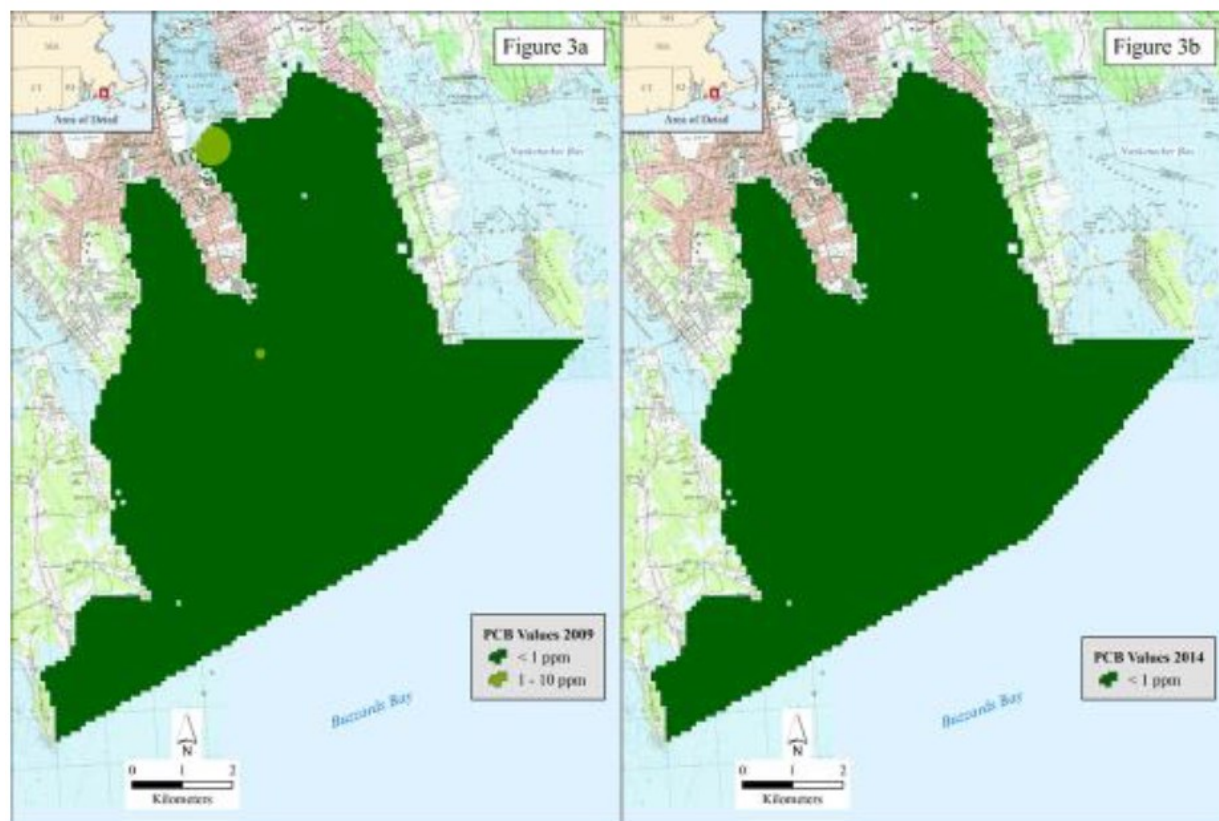
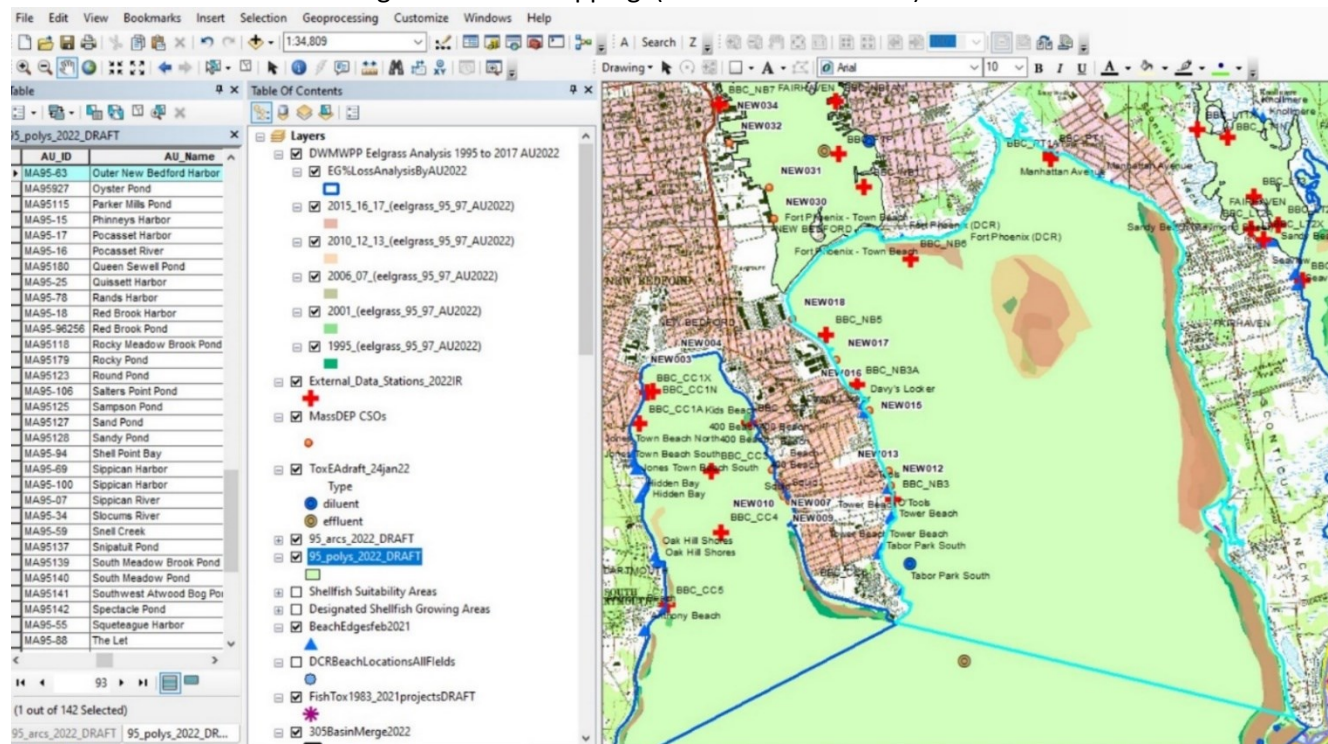


Figure 3: Spatial distributions of the interpolated sediment PCB concentration data for the outer harbor 2009 to 2014:



Outer New Bedford Harbor eelgrass habitat mapping (MassDEP Undated11)



Metals

New Bedford Harbor Superfund Site Long Term Monitoring – Round VII Final Summary Report (AECOM 2021): *“The U.S. Environmental Protection Agency’s Research Laboratory, Atlantic Ecology Division (EPA ACESD) in Narragansett, Rhode Island developed a long-term environmental monitoring program in 1993 to assess the effectiveness of the New Bedford Harbor Superfund remediation efforts over time. This program incorporates an intensive sampling and analysis effort for the purpose of quantifying the long-term environmental effects of reduced polychlorinated biphenyl (PCB) levels in the sediments and water column of the New Bedford Harbor estuary as a result of the on-going remediation efforts. The six previous sampling rounds for this program include the “baseline” sampling event conducted in October 1993 (long-term monitoring [LTM] I), a second event (LTM II) conducted immediately after removal of the “hot spot” sediments in October of 1995 and four subsequent events conducted in 1999, 2004, 2009, and 2014 (LTM III, IV, V, and VI). The seventh round of sampling and analysis (LTM VII) was conducted in the Fall of 2020 after the completion of Lower and Upper Harbor subtidal dredging activities, which were completed in June 2018 and March 2020, respectively. No further remediation is planned for the Outer Harbor (a sediment cap was placed over PCB-contaminated sediments near the Cornel-Dubilier plant in 2005 and 2015). The LTM VII work and report was prepared by AECOM for the U.S. Army Corps of Engineers New England District (USACE NAE) and Ocean Surveys Inc. (OSI) supported the boat-based sampling activities as a subcontractor to AECOM.”*

Metals data from these LTM surveys as follows:

Sediment metals data summary from 1993 sampling:

In 1993, as part of the NBH-LTM Program, numerous grab samples sediments were collected from the top 2 cm of New Bedford outer harbor at 23 sites using a Young-modified van Veen grab sampler, composited, and analyzed for 18 PCB congeners, TOC, AVS (acid volatile sulfide), and nine metals (Ni, Pb, Cd, Cu, Zn, Hg, As, Se, Cr). (Nelson, Bergen and Benyi, et al. 1996)

From Nelson *et al* 1996. Average metal and total PCB concentrations (in µg/g dry wt) in the outer harbor sediment from 1993. N (the number of stations in the segment) = 23 (includes sediment samples from Clarks Cove and Open Water). S-EL (severe effect level) and L-EL (low effect level) from Persaud *et al* 1993 in µg/g dry wt.

Parameter	Average Concentration	S-EL	L-EL
As	3.1	33	6
Cd	0.28	10	0.6
Cr	19	110	26
Cu	19	110	16
Hg	0.07	2	0.2
Ni	5.3	75	16
Pb	18	250	31
Se	0.23	NA	NA
Zn	42	820	120
Total PCBs	0.83	530	0.07

Sediment metals data summary (OH = Outer New Bedford Harbor) (Nelson and Bergen 2012). [Particular note: metals and toxicity testing discontinued after 2004 since the NBH-LTM data indicated that as a whole, the OH has very low PCB and metals concentrations, and the benthic community was healthy.]

Table 2 Means and standard deviations (SD) for seven of the metals quantified during the NBH-LTM program for each harbor segment-collection year combination

Year	Segment	Cd		Cr		Cu		Pb		Hg		Ni		Zn	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1993	UH	64.8	138.6	304.2	205.3	<i>611.7</i>	376.3	267.3	158.5	<i>0.4</i>	0.4	33.1	24.6	627.9	393.1
	LH	<i>12.4</i>	38.6	189.2	175.8	<i>454.2</i>	460.6	129.1	93.2	<i>0.4</i>	0.3	<i>10.6</i>	6	258	141.3
	OH	<i>0.3</i>	0.3	19	15.4	19.5	19.2	18.2	14	0.1	0.1	5.3	3.6	42.1	28.6
1995	UH	9.3	7.1	428.3	271.2	840.5	464.5	346.2	219.6	0.9	0.6	65.2	65	850	585.5
	LH	2.2	1.8	234.9	210.1	574.2	544.8	161	105.8	0.6	0.4	20	12.2	320.1	175.5
	OH	<i>0.2</i>	0.3	26.1	20.7	26.3	30.3	23.5	18.8	0.1	0.1	7.7	4.5	55.7	37.8
1999	UH	9.4	6	398.9	209.7	760.6	363.7	280.1	129.4	0.8	0.4	38.5	23.7	686.7	358.5
	LH	<i>1.9</i>	1.2	211.9	175.6	<i>638.5</i>	927.5	138.2	87.8	0.6	0.3	18.3	21	372.9	303.7
	OH	<i>0.2</i>	0.3	20.5	16.9	18.7	20	18.5	16.9	0	0	5.8	3.7	42.5	30.7
2004	UH	6.6	4.7	341.1	207.9	694.4	385.3	286.1	158.9	0.8	0.4	56.3	32.3	622.1	373.3
	LH	1.9	1.9	203	158.4	535.6	614.8	152.5	89.1	0.5	0.3	31.3	31.2	366.7	264.8
	OH	0.2	0.2	34.9	22.8	21.6	20.9	22	15.9	0.1	0.1	11.1	7	60.4	37.8

Spatial comparisons: means that are not significantly different ($p > 0.05$) among harbor segments within a collection year are shown in italics; those that are different are not italicized (e.g., in 1993, Cu concentrations were not different between the UH and LH). Temporal comparisons: means that are significantly different ($p < 0.05$) from the 1993 baseline values for each harbor segment are shown in bold (e.g., mean Cu concentrations for 1995, 1999, and 2004 in the UH were significantly higher than the 1993 values)

Sediment toxicity testing data summary (Nelson and Bergen 2012)

Table 3 Mean amphipod (*Ampelisca abdita*) survival (percent) for the 10-day sediment toxicity test

Year	Segment	Mean Survival (%)
1993	UH	55
	LH	66
	OH	91
1995	UH	22
	LH	48
	OH	84
1999	UH	2
	LH	32
	OH	75
2004	UH	46
	LH	68
	OH	81

Spatial comparisons: within a year, values connected by a line are not significantly different, which only occurred in 1993. Temporal comparisons: within a segment across years, bolded values are significantly different from 1993

Summary of sediment contaminants, sediment toxicity, and benthic community indexes (Nelson and Bergen 2012).

To further put the chemistry data in perspective, the mean effects range median quotient (ERM-Q) was calculated for both PCBs (sediment PCB concentration divided by effects range median, ERM) and metals (sediment As, Cd, Cr, Cu, Pb, Hg, Ni, and Zn concentrations divided by their respective ERM value, then summed at each station) and the values shown in Table 5. While the ERM value is not a site-specific criterion, it has been used to identify potential sediment toxicity (Long et al. 1998). Values < 1 are generally associated with minimal toxicity, while values above 1.6 are associated with significant toxicity. The metals ERM-Q values in the LH and

OH were below 1, indicating minimal effects, while those values in the UH were borderline, suggesting that some toxicity might be expected.

Table 5 Summary table showing sediment contaminants, sediment toxicity, and benthic community indices relative to site-specific criterion or threshold values^a discussed in the text

Segment	Year	Sediment Contaminants				Sediment Toxicity	Benthic Condition		
		PCBs	PCB ERM-Q	SEM-AVS	Metals ERM-Q		EMAP-BI	Shannon's H'	Number of Taxa
UH	1993	78	592	37	1.7	74	96	0.5	19
	1995	89	769	19	1.4	93	96	0.6	21
	1999	81	567	19	1.2	100	100	0.5	16
	2004	74	334	11	1.2	85	100	0.6	14
	2009	74	393				93	0.5	19
LH	1993	0	46	19	0.7	52	74	0.7	28
	1995	0	41	7	0.7	62	66	0.8	26
	1999	0	42	28	0.7	100	62	0.8	30
	2004	0	27	10	0.7	69	66	0.8	22
	2009	0	29				45	0.9	30
OH	1993	0	4.6	13	0.1	4	0	1.2	62
	1995	0	2.4	4	0.1	4	4	1.1	57
	1999	0	2.1	9	0.1	48	0	1.0	54
	2004	0	1.0	9	0.1	30	0	1.1	42
	2009	0	1.3				0	1.2	64

Boxes colored red indicate that the mean value for each harbor segment–collection year combination is significantly ($p < 0.05$) worse than its criterion or threshold value, yellow indicates no significant difference, and green indicates significantly better. Bolded values within the colored boxes are the percent of stations within each segment–year combination that violate the criterion or threshold value. Values in non-colored boxes (e.g., ERM-Q and taxa) are the segment–year means of other variables used to explain the responses relative to the criterion or threshold values

^a Site-specific criterion and threshold values:

PCBs=10 ppm for UH and OH, 50 ppm for LH

SEM-AVS>0

Sediment toxicity<80%

EMAP-BI<0

Recommendations

2022 Recommendations

ALU: Continue to monitor water quality in the Outer New Bedford Harbor (MA95-63), in particular for total nitrogen and dissolved oxygen in light of the recent increase in eelgrass bed habitat and the upgrade of the New Bedford WWTP.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an increase in eelgrass bed habitat in Outer New Bedford Harbor between 1995 and 2017 (~0.28 miles² to ~0.50 miles², respectively). The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at six locations along the north and west bank of Outer New Bedford Harbor (MA95-63) in summers 2014 through 2019, from inner to outer as follows: BBC_PT1, PT1A, NB6, NB5, NB3A, and NB3. Most of the stations were located just offshore (from jetties, docks and beaches), though BBC_NB6 was located ~680ft from shore near the hurricane barrier. Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at BBC_NB3A and NB6 (max average of 1.9m at BBC_NB3A and 3.4m at BBC_NB6) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 28.2°C (n=404). The minimum dissolved oxygen (DO) was 1.5mg/L (n=411), though it is noted the minima occurred at station BBC_PT1 (very close to shore and not considered to well represent water quality conditions of the AU). At BBC_NB6 and NB3A (the most representative stations in terms of location and number of measurements taken per year) slight excursions from the DO criterion (i.e., <6.0mg/L) occurred frequently (usually for >10% of the measurements and often for >20%), throughout the water column. DO concentrations <5.0mg/L were rare, occurring for >10% of the measurements for only three sample years (at ~3m depth) at BBC_NB6. Total nitrogen sampling (n=66, maximum 1.35mg/L at BBC_NB5 in 2016) during ebb tides in June through September documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.31-0.84mg/L: >0.4mg/L 10 of 16 times. The maximum chlorophyll *a* was 23.4µg/L (n=80); >5µg/L 57 times and >10µg/L 17 times (21%) with averages (when n>2) that ranged from 3.7 to 11.4µg/L. Secchi disk depths (n=169) ranged from 0.5 to 3.7m (yearly averages 1.6 to 2.7m). Ammonia-nitrogen concentrations were low (range 0.003 to 0.13mg/L, n=81), but TUs could not be calculated (lack of quality assured pH and salinity data). Between September 2015 and December 2019 harbor water was collected ~20 yards north of the concrete pier on the eastern shore of Clarks Point (near Fort Rodman), New Bedford, for use as site control in the City of New Bedford's WWTP (MA0100781) whole effluent toxicity (WET) tests. Survival of *M. bahia* (exposed 48-hours) was excellent (>95%, n=17). Survival of *M. beryllina* (exposed 7-days) ranged from was also excellent (>85%, n=18). The Aquatic Life Use for Outer New Bedford Harbor (MA95-63) will continue to be assessed as Not Supporting based on data collected by BBC staff/volunteers between 2014 and 2019. The Total Nitrogen and DO impairments are being carried forward. The Other Organics and Metals impairments are being removed (see justification in removal comments). Considering the increase in eelgrass bed habitat and excellent survival of *M. bahia* and *M. beryllina* exposed to the harbor water, recommendations are being made to monitor for further improvements.

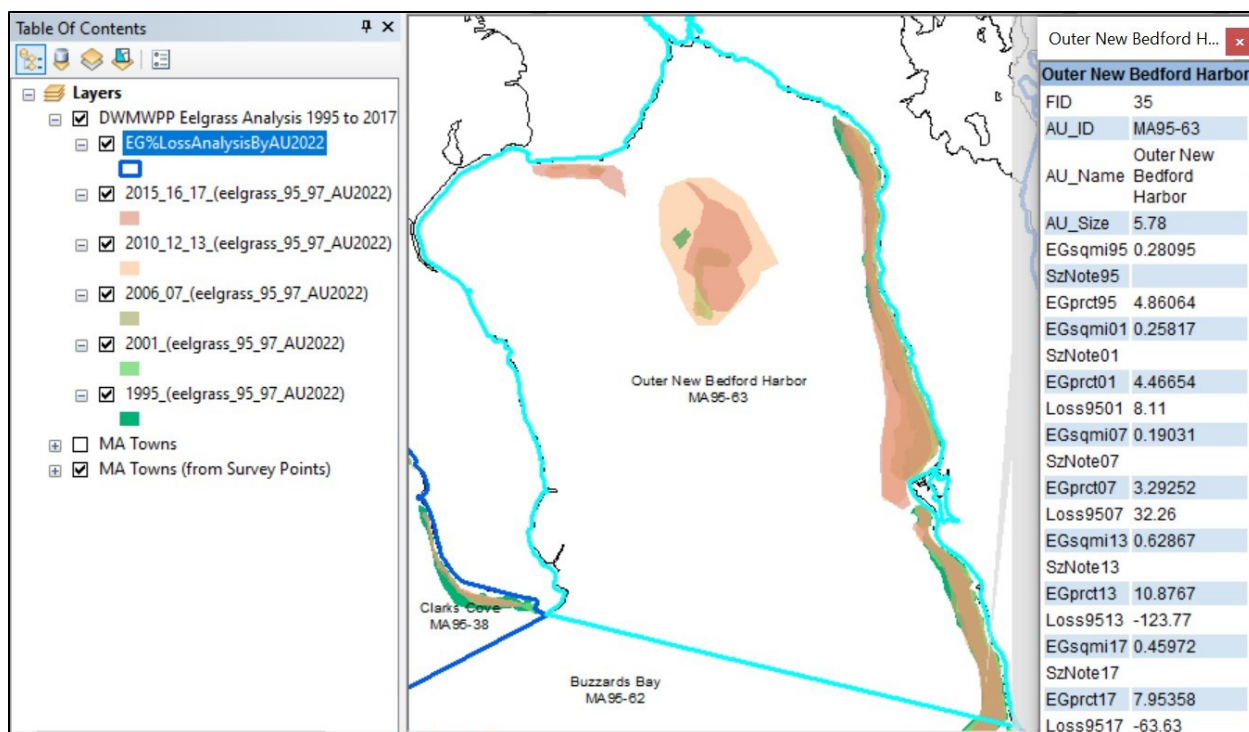
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_NB3	Buzzards Bay Coalition	Water Quality	New Bedford Harbor	New Bedford Harbor Outer, New Bedford	41.601866	-70.901505
BBC_NB3A	Buzzards Bay Coalition	Water Quality	New Bedford Harbor	New Bedford Harbor Outer, New Bedford	41.611666	-70.905597
BBC_NB5	Buzzards Bay Coalition	Water Quality	New Bedford Harbor	New Bedford Harbor Outer, New Bedford	41.615919	-70.909031
BBC_NB6	Buzzards Bay Coalition	Water Quality	New Bedford Harbor	New Bedford Harbor Outer, Fairhaven	41.622369	-70.8994
BBC_PT1	Buzzards Bay Coalition	Water Quality	New Bedford Harbor	New Bedford Harbor Outer, Fairhaven	41.631215	-70.883378
BBC_PT1A	Buzzards Bay Coalition	Water Quality	New Bedford Harbor	New Bedford Harbor Outer, Fairhaven	41.630803	-70.88341

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Outer New Bedford Harbor MA95-63 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an increase in eelgrass bed habitat in Outer New Bedford Harbor between 1995 and 2017 (~ 0.28 miles² to ~ 0.50 miles², respectively).

Toxicological Monitoring Information (Ambient, Effluent, Sediment)

New Bedford WWTF [MA95-63] Ambient testing information summary. (MassDEP Undated9)

Ambient

Between September 2015 and December 2019, water was collected from the Outer New Bedford Harbor (MA95-63) approximately 20 yards north of the concrete pier on the eastern shore of Clarks Point (near Fort Rodman) for use as dilution water in the City of New Bedford WWTP's whole effluent toxicity tests. Survival of *M. bahia* (exposed 48-hours) was excellent ($>95\%$) ($n=17$). Survival of *M. beryllina* (exposed 7-days) ranged from was also excellent ($>85\%$) ($n=18$).

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_NB3	07/24/18	08/21/18	0.2	3	5.8	6.6	33	0	0
BBC_NB3	07/11/19	08/15/19	0.2	3	6.2	6.7	0	0	0
BBC_NB3A	06/09/14	09/03/14	0.2	8	5.9	7.3	13	0	0
BBC_NB3A	06/09/14	09/03/14	1.7	8	5.8	7.3	13	0	0
BBC_NB3A	06/04/15	12/09/15	0.2	16	6.5	8.0	0	0	0
BBC_NB3A	01/06/16	09/25/16	0.2	26	5.5	6.8	12	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_NB3A	06/29/16	09/12/16	1.4	2	6.3	7.3	0	0	0
BBC_NB3A	01/09/17	09/19/17	0.2	13	5.9	7.4	8	0	0
BBC_NB3A	06/01/17	09/14/17	2.0	10	5.4	6.4	20	0	0
BBC_NB3A	05/30/18	09/20/18	0.3	18	4.9	6.7	33	6	0
BBC_NB3A	05/30/18	09/20/18	1.9	16	4.7	6.3	50	6	0
BBC_NB3A	05/30/19	09/18/19	0.2	19	6.4	8.3	0	0	0
BBC_NB3A	06/10/19	07/09/19	1.8	3	5.8	6.8	33	0	0
BBC_NB5	07/24/18	08/21/18	0.2	3	5.5	6.6	33	0	0
BBC_NB5	07/11/19	08/15/19	0.2	3	5.7	6.0	33	0	0
BBC_NB6	06/07/14	09/25/14	0.2	17	5.9	6.9	6	0	0
BBC_NB6	06/07/14	09/25/14	3.4	18	4.0	6.4	11	11	0
BBC_NB6	05/28/15	09/22/15	0.2	16	5.4	6.7	19	0	0
BBC_NB6	05/28/15	09/22/15	3.2	16	5.4	6.4	44	0	0
BBC_NB6	05/31/16	09/24/16	0.2	18	4.9	6.5	22	6	0
BBC_NB6	05/31/16	09/24/16	3.0	19	4.3	6.2	26	11	0
BBC_NB6	06/12/17	09/16/17	0.2	19	5.7	6.7	21	0	0
BBC_NB6	06/12/17	09/16/17	2.2	19	4.4	6.4	21	16	0
BBC_NB6	06/01/18	09/20/18	0.2	24	5.6	6.8	25	0	0
BBC_NB6	06/01/18	09/20/18	2.0	22	5.3	6.7	23	0	0
BBC_NB6	07/02/19	09/18/19	0.3	10	5.4	6.9	20	0	0
BBC_NB6	07/02/19	09/18/19	1.8	7	5.8	6.9	14	0	0
BBC_PT1	05/31/17	09/21/17	0.2	21	1.5	3.5	90	76	67
BBC_PT1	05/30/18	09/20/18	0.1	21	1.5	5.6	57	29	24
BBC_PT1	06/22/19	09/23/19	0.2	13	3.0	5.9	46	38	23

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_NB3	07/08/14	08/07/14	0.2	2	2	24.0	23.5	0
BBC_NB3	07/13/15	08/25/15	0.2	3	3	25.0	24.0	0
BBC_NB3	07/05/16	08/15/16	0.3	3	3	27.0	25.3	0
BBC_NB3	08/03/17	08/17/17	0.2	2	2	23.0	23.0	0
BBC_NB3	07/24/18	08/21/18	0.2	3	3	26.4	24.8	0
BBC_NB3	07/11/19	08/15/19	0.2	4	4	23.7	22.7	0
BBC_NB3A	06/09/14	09/03/14	0.2	8	8	23.6	22.0	0
BBC_NB3A	06/09/14	09/03/14	1.7	8	8	23.5	22.0	0
BBC_NB3A	06/04/15	09/24/15	0.2	18	16	25.0	22.1	0
BBC_NB3A	06/01/16	09/26/16	0.2	26	22	25.0	21.1	0
BBC_NB3A	06/29/16	09/12/16	1.4	2	2	23.6	22.9	0
BBC_NB3A	06/01/17	09/19/17	0.2	14	13	23.8	20.5	0
BBC_NB3A	06/01/17	09/14/17	2.0	10	10	23.5	21.2	0
BBC_NB3A	06/04/18	08/31/18	0.3	15	15	26.3	22.6	0
BBC_NB3A	06/04/18	08/31/18	1.8	13	13	26.3	22.9	0
BBC_NB3A	05/30/19	09/18/19	0.2	19	17	27.0	21.9	0
BBC_NB3A	06/10/19	07/09/19	1.8	3	3	22.4	19.5	0
BBC_NB5	07/08/14	08/07/14	0.2	3	3	24.0	22.7	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_NB5	07/13/15	08/25/15	0.2	3	3	25.0	24.0	0
BBC_NB5	07/05/16	08/15/16	0.3	3	3	27.0	25.3	0
BBC_NB5	08/03/17	08/17/17	0.2	2	2	23.0	23.0	0
BBC_NB5	07/24/18	08/21/18	0.2	3	3	26.5	25.1	0
BBC_NB5	07/11/19	08/15/19	0.2	4	4	23.3	22.9	0
BBC_NB6	06/07/14	09/25/14	0.2	18	17	24.0	22.1	0
BBC_NB6	06/07/14	09/25/14	3.3	17	16	23.7	22.0	0
BBC_NB6	06/04/15	09/22/15	0.2	18	16	25.9	22.8	0
BBC_NB6	06/04/15	09/22/15	3.2	15	13	25.6	22.4	0
BBC_NB6	06/07/16	09/24/16	0.4	24	21	27.0	23.4	0
BBC_NB6	06/07/16	09/24/16	3.0	21	18	26.6	22.9	0
BBC_NB6	06/12/17	09/16/17	0.2	21	20	25.8	22.0	0
BBC_NB6	06/12/17	09/16/17	2.2	19	18	27.9	22.0	0
BBC_NB6	06/01/18	08/31/18	0.2	20	20	26.5	22.9	0
BBC_NB6	06/01/18	09/16/18	2.0	18	17	26.5	22.5	0
BBC_NB6	07/02/19	09/18/19	0.3	11	10	26.3	23.1	0
BBC_NB6	07/02/19	09/18/19	1.8	7	6	26.3	22.9	0
BBC_PT1	07/18/16	08/15/16	0.2	2	2	28.0	27.8	0
BBC_PT1	06/06/17	09/21/17	0.2	19	17	25.5	20.5	0
BBC_PT1	06/06/18	09/05/18	0.1	17	17	28.2	22.8	0
BBC_PT1	06/22/19	09/23/19	0.2	13	12	25.0	21.8	0
BBC_PT1A	07/13/15	07/13/15	0.2	1	1	24.0	24.0	0
BBC_PT1A	08/03/17	08/03/17	0.2	1	1	22.0	22.0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_NB3	2014	0.2	2	0.45	0.58	0.52	2	3.62	4.00	3.81	2	0
BBC_NB3	2015	0.2	3	0.26	0.64	0.44	3	6.91	12.29	8.73	0	1
BBC_NB3	2016	0.3	3	0.38	0.45	0.41	3	5.18	6.19	5.69	0	0
BBC_NB3	2017	0.2	2	0.52	0.67	0.60	2	1.09	5.11	3.10	1	0
BBC_NB3	2018	0.2	3	0.35	0.43	0.39	3	6.89	11.20	9.38	0	2
BBC_NB3	2019	0.2	3	0.35	0.39	0.38	4	5.50	6.09	5.80	0	0
BBC_NB3A	2015	0.2	4	0.25	0.35	0.31	7	0.60	12.63	4.76	4	1
BBC_NB3A	2016	0.2	5	0.28	0.40	0.33	8	1.03	16.38	4.80	6	1
BBC_NB3A	2017	0.2	4	0.36	0.73	0.62	6	4.54	13.18	8.71	1	2
BBC_NB3A	2018	0.2	1	0.55	0.55	0.55	1	10.15	10.15	10.15	0	1
BBC_NB5	2014	0.2	3	0.40	0.98	0.68	3	2.08	4.49	3.67	3	0
BBC_NB5	2015	0.2	3	0.29	0.71	0.49	3	5.97	14.69	9.76	0	1
BBC_NB5	2016	0.3	3	0.48	1.35	0.84	3	5.07	21.91	11.41	0	1

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_NB5	2017	0.2	2	0.71	0.72	0.72	2	5.97	23.36	14.67	0	1
BBC_NB5	2018	0.2	3	0.38	0.42	0.40	3	4.30	12.55	8.66	1	1
BBC_NB5	2019	0.2	3	0.39	0.49	0.43	3	4.09	9.30	7.14	1	0
BBC_NB6	2014	0.2	1	1.04	1.04	1.04	1	3.06	3.06	3.06	1	0
BBC_NB6	2015	0.2	3	0.25	0.88	0.53	3	3.91	9.25	6.68	1	0
BBC_NB6	2016	0.2	3	0.35	0.64	0.53	3	5.07	22.20	11.33	0	1
BBC_NB6	2017	0.2	2	0.58	0.64	0.61	2	5.71	14.20	9.96	0	1
BBC_NB6	2018	0.2	3	0.34	0.41	0.38	3	7.05	12.53	9.54	0	1
BBC_NB6	2019	0.2	1	0.56	0.56	0.56	3	5.53	10.42	7.24	0	1
BBC_PT1	2016	0.2	1	0.48	0.48	0.48	1	5.42	5.42	5.42	0	0
BBC_PT1	2017	0.2	--	--	--	--	3	5.36	10.91	8.45	0	0
BBC_PT1	2018	0.2	3	0.49	0.64	0.54	3	4.94	5.84	5.24	2	0
BBC_PT1A	2015	0.2	1	0.26	0.26	0.26	1	5.30	5.30	5.30	0	0
BBC_PT1A	2017	0.2	1	0.69	0.69	0.69	1	19.77	19.77	19.77	0	1

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_NB3	07/13/15	08/25/15	3	1.8	2.1	2.0
BBC_NB3	07/05/16	08/01/16	2	1.9	2.0	2.0
BBC_NB3	08/03/17	08/17/17	2	2.2	2.3	2.3
BBC_NB3	07/24/18	08/21/18	3	1.7	2.8	2.2
BBC_NB3	08/08/19	08/08/19	1	1.6	1.6	1.6
BBC_NB3A	06/27/14	08/14/14	2	2.2	2.5	2.4
BBC_NB3A	06/16/15	10/09/15	9	1.4	3.1	2.2
BBC_NB3A	01/06/16	09/18/16	14	0.9	2.4	1.7
BBC_NB3A	01/09/17	09/07/17	10	1.1	2.2	1.7
BBC_NB3A	05/30/18	09/10/18	9	0.5	2.5	1.9
BBC_NB3A	06/04/19	09/14/19	8	2.1	2.6	2.3
BBC_NB5	07/13/15	08/25/15	3	1.8	2.5	2.0
BBC_NB5	07/05/16	08/15/16	3	2.0	2.5	2.2
BBC_NB5	08/03/17	08/17/17	2	1.9	2.4	2.2
BBC_NB5	07/24/18	08/07/18	2	1.4	1.9	1.7
BBC_NB5	07/11/19	08/15/19	4	1.8	2.6	2.1
BBC_NB6	06/07/14	09/25/14	17	1.2	3.7	2.7
BBC_NB6	05/28/15	09/22/15	17	1.3	3.1	2.6
BBC_NB6	05/31/16	09/18/16	21	1.4	3.7	2.7
BBC_NB6	06/12/17	09/12/17	14	0.5	3.0	2.0
BBC_NB6	06/12/18	09/20/18	16	1.4	2.4	2.0
BBC_NB6	07/02/19	09/15/19	6	1.5	2.3	2.0
BBC_PT1A	07/13/15	07/13/15	1	2.1	2.1	2.1

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

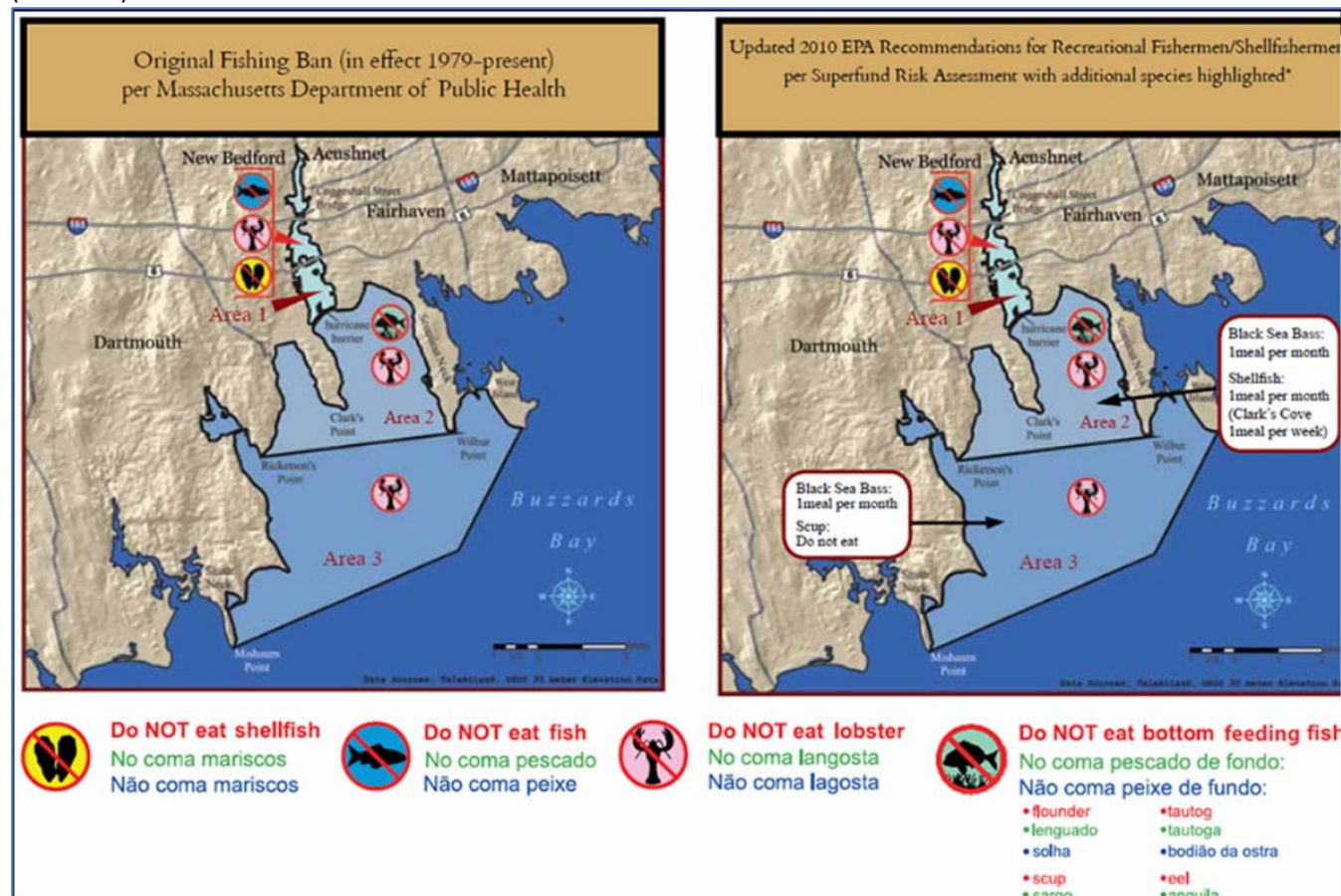
Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_NB3	07/08/14	08/07/14	0.2	2	0.007	0.02	0.014
BBC_NB3	07/13/15	08/25/15	0.2	3	0.011	0.031	0.018
BBC_NB3	07/05/16	08/15/16	0.3	3	0.011	0.026	0.018
BBC_NB3	08/03/17	08/17/17	0.2	2	0.007	0.037	0.022
BBC_NB3	07/24/18	08/21/18	0.2	3	0.004	0.032	0.013
BBC_NB3	07/11/19	08/15/19	0.2	4	0.004	0.026	0.013
BBC_NB3A	06/16/15	12/09/15	0.2	7	0.006	0.06	0.027
BBC_NB3A	01/06/16	09/26/16	0.2	9	0.003	0.041	0.013
BBC_NB3A	01/09/17	09/19/17	0.2	6	0.011	0.025	0.019
BBC_NB3A	07/10/18	07/10/18	0.2	1	0.009	0.009	0.009
BBC_NB5	07/08/14	08/07/14	0.2	3	0.013	0.032	0.023
BBC_NB5	07/13/15	08/25/15	0.2	3	0.01	0.05	0.027
BBC_NB5	07/05/16	08/15/16	0.3	3	0.018	0.052	0.032
BBC_NB5	08/03/17	08/17/17	0.2	2	0.007	0.046	0.027
BBC_NB5	07/24/18	08/21/18	0.2	3	0.004	0.08	0.03
BBC_NB5	07/11/19	08/15/19	0.2	4	0.004	0.066	0.027
BBC_NB6	07/22/14	07/22/14	0.2	1	0.127	0.127	0.127
BBC_NB6	07/13/15	08/25/15	0.2	3	0.011	0.062	0.039
BBC_NB6	07/05/16	08/15/16	0.3	3	0.01	0.043	0.021
BBC_NB6	08/03/17	08/17/17	0.2	2	0.007	0.027	0.017
BBC_NB6	07/24/18	08/21/18	0.2	3	0.003	0.065	0.024
BBC_NB6	07/11/19	08/15/19	0.2	4	0.004	0.040	0.014
BBC_PT1	07/18/16	08/15/16	0.2	2	0.004	0.015	0.01
BBC_PT1	07/10/18	08/07/18	0.2	3	0.003	0.004	0.003
BBC_PT1A	07/13/15	07/13/15	0.2	1	0.01	0.01	0.01
BBC_PT1A	08/03/17	08/03/17	0.2	1	0.007	0.007	0.007

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
The Fish Consumption Use for Outer New Bedford Harbor (MA95-63) will continue to be assessed as Not Supporting with the PCB's in Fish Tissue impairment being carried forward. EPA and MA DPH recommend the public not eat any shellfish, fish, or lobster from area 1 of New Bedford Harbor (includes a portion of this Outer New Bedford Harbor AU) and area 2 (includes a portion of this Outer New Bedford Harbor AU) recommend the public not eat lobster, nor specific bottom feeding fish (flounder, tautog, scup, or eel), and should limited consumption of black sea bass and shellfish to one meal per month because of PCB contamination (EPA 2022).	

New Bedford Harbor Fish Consumption Regulations and Recommendations

(EPA 2022)



Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Outer New Bedford Harbor (MA95-63): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 5.7299 sq mi (99%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB14.2	New Bedford East Coastal (WWTP)	Prohibited	0.00022	0.0%
BB15.11	New Bedford/Fairhaven Inner Harbor	Prohibited	0.00007	0.0%
BB15.20	Monkey Pier	Conditionally Approved	0.00491	0.1%
BB15.4	Fairhaven Outer Harbor East	Conditionally Approved	4.74882	82.2%

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB15.42	Winsegansett Pond, Northern Mouth	Prohibited	0.02814	0.5%
BB15.43	Winsegansett Pond, Western Mouth	Prohibited	0.00435	0.1%
BB15.52	Fort Rodman East	Prohibited	0.23888	4.1%
BB15.6	Shipping Channel	Prohibited	0.06518	1.1%
BB15.7	Outer Harbor North	Prohibited	0.63939	11.1%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Outer New Bedford Harbor (MA95-63) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>There are seven beaches in Outer New Bedford Harbor (MA95-63); three in Fairhaven and four in New Bedford. The names and ID codes for the beaches are as follows: On the north and east banks in Fairhaven, Manhattan Ave (ID 2819), Fort Phoenix-Town beach (ID 5494), and Fort Phoenix-DCR beach (ID 2820). On the west bank in New Bedford, Davy's Locker (ID 3026), O' Tools (ID 3024), Tower beach (ID 3018), Tabor Park (ID 3020). All the beaches were either never or infrequently posted for swimming between 2014 and 2019.</p> <p>Although none of the seven beaches along the shoreline of Outer New Bedford were frequently posted with swimming advisories between 2014 and 2019, the Primary Contact Recreational Use for Outer New Bedford Harbor (MA95-63) will continue to be assessed as Not Supporting based on a presumptive impairment decision because of the presence of CSO outfalls (this waterbody does not have a CSO variance in place).</p>	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2819	Manhattan Avenue/Fairhaven	41.62898	-70.87790	41.62850	-70.87650	0%	0%	0%	0%	0%	0%	0
2820	Fort Phoenix (DCR)/Fairhaven	41.62406	-70.90030	41.62499	-70.89340	0%	0%	0%	0%	0%	2%	0
3018	Tower Beach/New Bedford	41.59773	-70.90290	41.60025	-70.90170	4%	3%	0%	2%	0%	5%	0
3020	Tabor Park South/New Bedford	41.59735	-70.90320	41.59421	-70.90050	3%	2%	0%	0%	0%	2%	0
3024	O'Tools/New Bedford	41.60285	-70.90210	41.60045	-70.90180	3%	4%	0%	1%	0%	2%	0

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
3026	Davy's Locker/New Bedford	41.61010	-70.90480	41.60931	-70.90470	4%	3%	0%	0%	0%	2%	0
5494	Fort Phoenix - Town Beach/Fairhaven	41.62469	-70.90330	41.62402	-70.90040	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Outer New Bedford Harbor (MA95-63): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 5.7299 sq mi (99%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>There are seven beaches in Outer New Bedford Harbor (MA95-63); three in Fairhaven and four in New Bedford. The names and ID codes for the beaches are as follows: On the north and east banks in Fairhaven, Manhatten Ave (ID 2819), Fort Phoenix-Town beach (ID 5494), and Fort Phoenix-DCR beach (ID 2820). On the west bank in New Bedford, Davy's Locker (ID 3026), O' Tools (ID 3024), Tower beach (ID 3018), Tabor Park (ID 3020). All the beaches were either never or infrequently posted for swimming between 2014 and 2019.</p> <p>Although none of the seven beaches along the shoreline of Outer New Bedford were frequently posted with swimming advisories between 2014 and 2019, the Secondary Contact Recreational Use for Outer New Bedford Harbor (MA95-63) will continue to be assessed as Not Supporting based on a presumptive impairment decision because of the presence of active CSO outfalls (this waterbody does not have a CSO variance in place).</p>	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Outer New Bedford Harbor (MA95-63): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 5.7299 sq mi (99%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Oyster Pond (MA95927)

Location:	west of Route 28A, Falmouth.
AU Type:	ESTUARY
AU Size:	0.01 SQUARE MILES
Classification/Qualifier:	SA: SFO

No usable data were available for Oyster Pond (MA95927) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Dissolved Oxygen	34331	Unchanged
4a	4a	Estuarine Bioassessments	34331	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Impervious Surface/Parking Lot Runoff (Y)	X					
Dissolved Oxygen	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Dissolved Oxygen	Residential Districts (Y)	X					
Estuarine Bioassessments	Impervious Surface/Parking Lot Runoff (Y)	X					
Estuarine Bioassessments	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Estuarine Bioassessments	Residential Districts (Y)	X					

Parker Mills Pond (MA95115)

Location:	Wareham.
AU Type:	FRESHWATER LAKE
AU Size:	73 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Non-Native Aquatic Plants*)		Unchanged
5	5	Dissolved Oxygen		Added
5	5	Phosphorus, Total		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Non-Native Aquatic Plants*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X		X	X	X
Dissolved Oxygen	Source Unknown (N)	X				
Phosphorus, Total	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X		X	X	X
Phosphorus, Total	Source Unknown (N)	X		X	X	X

Recommendations

2022 Recommendations
ALU: Conduct additional monitoring for total phosphorus at a representative location in Parker Mills Pond (MA95115), in light of the good water quality data collected by the BBC just upstream of Elm Street in 2015-2019. Consider delisting the Total Phosphorus impairment if conditions continue to improve. Also conduct a representative number of DO profiles in the pond (at the deep holes) to confirm if low DO concentrations are having an impact on the Aquatic Life Use.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

DMF biologists note one potential barrier providing adequate passage to diadromous fish at the downstream end of Parker Mills Pond. The Parker Mill Dam (NATID# MA00150)(with existing fishway) located at Elm Street in Wareham, was given a passage score of "1" on a 0-10 scale, indicating that the dam is only a minor obstruction to the passage of the targeted fish species, river herring and American eel. The population score was "5" in this area. It was further noted by DMF that passage is adequate (via an eel ramp installed in 2009), though active maintenance and bog coordination is needed. Baffle repairs were carried out as recently as 2019. As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, variable milfoil (*Myriophyllum heterophyllum*), in Parker Mills Pond during a July 1995 synoptic survey. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at one location in Parker Mills Pond, Wareham (MA95115) in the summers of 2015-2019, just upstream of Elm Street and the Parker Mill dam (BBC_MP1). Monitoring was conducted in the surface water, as well as deeper in the water column (at depths ranging 0.6-1.4m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 26.9°C (n=161). The minimum dissolved oxygen (DO) was 0.4mg/L (n=172), <5.0mg/L 53 times between May and September (~31% of the measurements overall), 9 times between May and July (when anadromous fish early life stages are potentially present) (~5% of the measurements) and <4.0mg/L 37 times (~22% of the measurements). Excursions from the 5.0mg/L criterion occurred more frequently and were more severe (i.e., <4.0mg/L) at depth rather than near the surface. Total phosphorus sampling (n=20, maximum 0.019mg/L) in July and August documented seasonal average total phosphorus concentrations between 0.012-0.016mg/L. The maximum Chlorophyll *a* was 10.9µg/L (n=20). Secchi disk depth (measured in 2015, 2016, 2018, and 2019) were often low for a freshwater lake, ranging from 0.4-1.8m (n=22), with the yearly average being <1.2m for three out of the four sample years. Ammonia-nitrogen concentrations were generally low (range 0.006 to 0.037mg/L (n=20)), though TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for Parker Mills Pond (MA95115) will continue to be assessed as Not Supporting with the Non-Native Aquatic Plants impairment (for *Myriophyllum heterophyllum*) being carried forward. While total phosphorus concentration data collected by BBC staff/volunteers from 2015-2019 are lower than prior studies (all <0.025mg/L), the impairment for Total Phosphorus is also being carried forward at this time. Recommendations will be made to evaluate newer data and if improved conditions in Parker Mills Pond are documented, total phosphorus may be delisted in a future IR reporting cycle. Dissolved Oxygen is being added as an impairment due to the frequent and severely low measurements documented by BBC in 2015-2019.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_MP1	Buzzards Bay Coalition	Water Quality	Parkers Mill Pond	Parkers Mill Pond, Wareham	41.767448	-70.722141

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note one potential barrier providing adequate passage to diadromous fish at the downstream end of this AU. The Parker Mill Dam (NATID# MA00150)(with existing fishway) located at Elm Street in Wareham, was given a passage score of "1" on a 0-10 scale, indicating that the dam is only a minor obstruction to the passage of the targeted fish species, river herring and American eel. The population score was noted to be "5" in this area. It was further noted by DMF that passage is adequate (via an eel ramp installed in 2009), though active maintenance and bog coordination is needed. Baffle repairs were carried out as recently as 2019.

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995)

Summary Statement
As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, variable milfoil (<i>Myriophyllum heterophyllum</i>), in Parker Mills Pond during a July 1995 synoptic survey.

Physico-chemical Water Quality Information

DO, pH, Temperature (Depth Profiles)

Buzzards Bay Coalition Freshwater Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Average Sample depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
BBC_MP1	06/04/15	09/21/15	0.2	21	2.5	7.1	3	0	1
BBC_MP1	06/04/15	09/21/15	0.9	22	1.4	5.3	9	0	9
BBC_MP1	06/06/16	08/30/16	0.2	14	2.1	6.4	2	0	1
BBC_MP1	06/06/16	08/30/16	1.4	13	0.4	2.8	10	4	9
BBC_MP1	05/30/17	09/21/17	0.2	19	3.5	6.8	1	0	1
BBC_MP1	07/06/17	09/21/17	0.8	14	3.0	5.3	6	0	4
BBC_MP1	06/12/18	09/20/18	0.2	22	4.0	7.0	2	0	0
BBC_MP1	06/05/18	08/21/18	0.9	5	0.8	3.6	3	1	2
BBC_MP1	07/02/19	09/23/19	0.2	18	1.2	6.2	6	0	3
BBC_MP1	06/04/19	09/23/19	0.7	24	0.4	5.6	11	4	7

Buzzards Bay Coalition Discrete Freshwater Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_MP1	05/28/15	09/21/15	0.2	23	21	26.3	23.2	17	16	0	0
BBC_MP1	05/28/15	09/21/15	0.9	23	21	26.4	22.6	17	15	0	0
BBC_MP1	06/06/16	08/30/16	0.2	14	14	26.9	24.0	14	13	0	0
BBC_MP1	06/06/16	08/30/16	1.4	13	13	24.7	22.7	13	9	0	0
BBC_MP1	05/30/17	09/21/17	0.2	19	17	26.9	22.1	13	12	0	0
BBC_MP1	07/06/17	09/21/17	0.8	14	12	24.9	21.8	9	7	0	0
BBC_MP1	06/12/18	09/20/18	0.2	22	21	26.1	22.5	17	11	0	0
BBC_MP1	07/10/18	08/21/18	1.1	4	4	24.3	23.3	4	4	0	0
BBC_MP1	07/02/19	09/23/19	0.2	18	16	26.0	23.2	14	12	0	0
BBC_MP1	06/04/19	09/23/19	0.6	24	22	25.0	21.9	16	13	0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Freshwater Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	DO Sat Max (%)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count >16µg/L
BBC_MP1	2015	0.2	4	0.013	0.017	0.015	--	4	5.15	10.90	7.51	0
BBC_MP1	2016	0.2	4	0.015	0.019	0.016	--	4	1.76	3.87	2.74	0
BBC_MP1	2017	0.2	4	0.015	0.015	0.015	--	4	2.57	10.42	4.72	0
BBC_MP1	2018	0.2	4	0.015	0.015	0.015	--	4	2.10	2.90	2.61	0
BBC_MP1	2019	0.2	4	0.008	0.015	0.012	--	4	1.91	7.24	4.11	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_MP1	06/25/15	08/28/15	5	0.5	1.0	0.9
BBC_MP1	06/06/16	08/30/16	8	0.4	1.2	0.9
BBC_MP1	07/24/18	08/27/18	3	0.8	1.8	1.2
BBC_MP1	07/11/19	08/28/19	6	1.0	1.0	1.0

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_MP1	07/13/15	08/25/15	0.2	4	0.012	0.037	0.021
BBC_MP1	07/05/16	08/15/16	0.2	4	0.007	0.018	0.012
BBC_MP1	07/06/17	08/17/17	0.2	4	0.006	0.012	0.008
BBC_MP1	07/10/18	08/21/18	0.2	4	0.012	0.026	0.016
BBC_MP1	07/11/19	08/15/19	0.2	4	0.007	0.021	0.014

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
Fish toxics sampling was performed by MassDEP WPP biologists at Parker Mills Pond (MA95115) in May 2018 as part of the probabilistic lake surveys (MAP2). Edible fillets were analyzed for the presence of mercury, metals, and organochlorine pesticides. No site-specific fish consumption advisory was issued by MA DPH. The Fish Consumption Use for Parker Mills Pond (MA95115) is Not Assessed since no site-specific advisory has been issued by MA DPH.	

MassDEP fish toxics sampling information (2018-2020) and MassDPH Fish Consumption Advisory information (2019-2021) (MassDEP 2018, MassDEP Undated11).

Fish toxics sampling was performed by MassDEP WPP biologists at Parker Mills Pond (MA95115) in May 2018 as part of the probabilistic lake surveys (MAP2). Edible fillets were analyzed for the presence of mercury, metals, and organochlorine pesticides. No site-specific fish consumption advisory was issued by MassDPH.

Aesthetic

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Parker Mills Pond (MA95115), so it will continue to be assessed as Not Supporting, with the Non-Native Aquatic Plants, and Total Phosphorus impairments being carried forward.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the status of the Primary Contact Recreation Use for Parker Mills Pond (MA95115) so it will continue to be assessed as Not Supporting with the Non-Native Aquatic Plants and Total Phosphorus impairments being carried forward.	

Secondary Contact Recreation

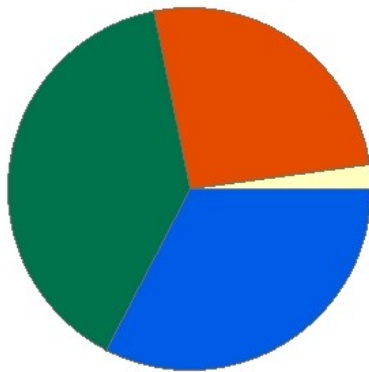
2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the status of the Secondary Contact Recreation Use for Parker Mills Pond (MA95115) so it will continue to be assessed as Not Supporting with the Non-Native Aquatic Plants and Total Phosphorus impairments being carried forward.	

Paskamanset River (MA95-11)

Location:	Headwaters, outlet Turners Pond, Dartmouth/New Bedford to confluence with Slocums River (Rock O'Dundee Road), Dartmouth.
AU Type:	RIVER
AU Size:	10.5 MILES
Classification/Qualifier:	B

Paskamanset River - MA95-11

Watershed Area: 28.64 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	28.64	7.34	7.31	1.78
Agriculture	2.2%	3.8%	2.5%	3.7%
Developed	26%	12.6%	19.7%	10.8%
Natural	39.3%	48%	37%	42.1%
Wetland	32.6%	35.7%	40.8%	43.5%
Impervious Cover	12.7%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Fish Passage Barrier*)		Added
5	5	Combined Biota/Habitat Bioassessments		Unchanged
5	5	Dissolved Oxygen		Added
5	5	Enterococcus		Unchanged
5	5	Escherichia Coli (E. Coli)		Unchanged
5	5	Lead		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Hydrostructure Impacts on Fish Passage (Y)	X				
Combined Biota/Habitat Bioassessments	Source Unknown (N)	X				
Dissolved Oxygen	Source Unknown (N)	X				
Enterococcus	Source Unknown (N)				X	
Escherichia Coli (E. Coli)	Source Unknown (N)				X	X
Lead	Source Unknown (N)	X				

Recommendations

2022 Recommendations
ALU: Additional monitoring for metals (particularly copper) should be conducted in this Paskamanset River AU (MA95-11) near Rt. 6 Dartmouth since some exceedances were documented in summer 2013.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
<p>DMF biologists note three structures in Dartmouth causing passage limitation to diadromous fish (targeted species river herring & American eel) throughout this Paskamanset River AU (MA95-11). From upstream to downstream: The Turners Pond Dam (NATID# MA01152) passage score of 10 (no possible passage) (population score 2) between the river & the upstream AU (Turner Pond MA95151). The Smith Mills Dam (NATID# MA03026), just upstream of Rt. 6 (passage score 9 = severe impediment) (population score 2), though it was noted that river herring currently cannot reach this site. The Russell Mills Pond Dam (NATID# MA02403) (with existing fishway) at the DS end of the AU, was given a passage score of "5" (restricted passage) (population score of 3). MA DFG biologists collected a fish sample roughly in the middle of the AU ~2500m downstream from Rt. 6 (SampleID 5060) in August 2013. The fish community at this low gradient habitat site was indicative of healthy conditions with moderately tolerant/intolerant macrohabitat generalists comprising 68% of the sample (chain pickerel, pumpkinseed, and redbfin pickerel). Benthic and water quality monitoring was also conducted by MassDEP staff downstream from Rt. 6 (B0862, W2404) in summer 2013, as part of the MAP2 monitoring project. The benthic community sample IBI score (33) was indicative of severely degraded conditions using the Statewide low gradient index. Water quality sampling data including both deployed probe and discrete sampling efforts can be summarized as follows: minimum dissolved oxygen (DO) 2.1mg/L (104 day probe deploy), 30DADA <6.0mg/L 65 times, 7DADMin <5.0mg/L 32 times, and the one-day minimum <4.0mg/L 18 times. The maximum temperature was 27.2°C with maximum a 24hr rolling average 26.7°C. The pH ranged from 6.1 to 6.5SU (n=3) with generally no physico-chemical indicators of nutrient enrichment (seasonal average total phosphorus 0.078mg/L (n=4), max DO sat 74.8%, max pH 6.5U and no observations of any dense/very dense filamentous algae during four site visits) though diel DO shift maximum was high 5.9mg/L. Specific conductance and chloride were both low (max 338µS/cm and 73mg/L, respectively, n=3), as was total ammonia-nitrogen (TAN) (max 0.09mg/L, n=3 with no toxicity estimated). There were several metals exceedances (n=3): one acute copper criterion (TU 1.3), two chronic copper criterion (TUs 1.67, 1.26), two chronic cadmium criterion (TUs 1.6, 1.1), and three chronic lead criterion (TUs 2.7, 2.4, 1.1) (note: no exceedances for Al, but dissolved Al data were compared to total recoverable Al criteria, so exceedances cannot be ruled out). Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at 1 location in the summers of 2015-19 (between 6 & 9am) at Russells Mills Rd (BBC_PKR1). The max temp was 26°C (n=89); min DO 3.5mg/L (n=88); <5.0mg/L 12 times between May & July & <4.0mg/L 2 times. Nutrient sampling documented seasonal average total phosphorus 0.013-0.039mg/L (n=14, max 0.059mg/L) and a maximum chlorophyll <i>a</i> of 9.03µg/L (n=14). Ammonia-nitrogen ranged from 0.061 to 0.186mg/L (n=14), though TU's could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for Paskamanset River (MA95-11) will continue to be assessed as Not Supporting with the Combined Biota/Habitat Bioassessments impairment being carried forward (historically based on degraded benthic and fish conditions and reduced baseflows due to groundwater withdrawals). Impairments are being added for Fish Passage Barrier, Dissolved Oxygen, and Lead based on DMF biologists passage information as well as data collected by MassDEP staff just downstream of Rt.6 in 2013 and BBC staff/volunteers at Russells Mills Rd in 2015-19. An Alert is identified for the acute copper exceedance at Rt.6 in 2013.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
5060	MassDEP	Fish Community	Paskamanset River	~2500 ft DS/S of Rt 6 (state rd)	41.63338	-70.98602
B0862	MassDEP	Benthic	Paskamanset River/	[approximately 760 meters downstream/south from Route 6 (State Road), Dartmouth, MA]	41.633384	-70.986022
W2404	MassDEP	Water Quality	Paskamanset River	[approximately 2500 feet downstream/south from Route 6 (State Road), Dartmouth]	41.633384	-70.986022

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_PKR1	Buzzards Bay Coalition	Water Quality	Paskamansett River	Paskamansett River, Dartmouth	41.585764	-70.990227

Biological Monitoring Information

Benthic Macroinvertebrate Data

MassDEP Benthic Macroinvertebrate Data (2011-2017). (MassDEP Undated5)

[Index Biological Condition Class: E= Exceptional, S= Satisfactory, MD= Moderately Degraded, SD= Severely Degraded; High Gradient IBI Thresholds: E= 100-75, S= 74-55, MD= 54-35, SD= 34-0; Low Gradient IBI Thresholds: E= 100-81, S= 80-62, MD= 61-38, SD= 37-0; R qualifier = Rarefaction (100ct) <55]

Station Code	Collection Date	Collection Method	Index Type	Organism Count	Index Score	Index Biological Condition Class
B0862	07/03/13	RBP multihab	Statewide_Low_Gradient	296	33	SD

Fish Community Data and DELTS

Fish Community Data (2012-2019) Provided by MassDFG. (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net, Gradient: H = High, L = Low; I/MT MG= Intolerant/Moderately Tolerant Macrohabitat Generalist]

[Species List: AE = American Eel, B = Bluegill, CP = Chain Pickerel, GS = Golden Shiner, P = Pumpkinseed, RP = Redfin Pickerel]

Sample ID	Sample Date	Method	Sample Type	Gradient	Total Taxa	Total Ind	Cold Ind %	Fluvial Taxa	Fluvial Ind %	Intol Ind %	I/MT MG Taxa	I/MT MG Ind %	Notables	CFR	Species List
5060	08/30/13	NS	TP		6	50	0%	0	0%	0%	3	68%	Yes	No	AE, B, CP, GS, P, RP,

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary

DMF biologists note three structures causing passage limitation to diadromous fish throughout this Paskamanset River AU. The targeted species at all three structures are river herring and American eel. From upstream to downstream the structures are: The Turners Pond Dam (NATID# MA01152), was given a passage score of 10 on a 0-10 scale (with 10 equating to no possible passage), indicating that the dam allows no possible passage of diadromous fish between the river and the upstream AU (Turner Pond MA95151). The population score was noted to be "2". It was also noted that river herring currently cannot reach this site. The Smith Mills Dam (NATID# MA03026), located just upstream of Rt.6 in Dartmouth, was given a passage score of "9" (severe impediment) with a population score of "2". It was also noted that river herring currently cannot reach this site, though the Town is interested in gaining passage. At the very bottom of the AU the Russell Mills Pond Dam (NATID# MA02403) (with existing fishway), was given a passage score of "5" (restricted passage) with a population score of "3". It was also noted that a culvert and entrance at the dam creates problems, consequently rehab and removal projects are both under consideration. The Aquatic Life Use for Paskamanset River (Assessment Unit MA95-11) is assessed as Not Supporting based on the barrier to diadromous fish passage at the three dams mentioned above.

Physico-chemical Water Quality Information

DO, pH, Temperature

MassDEP Long-term Continuous Dissolved Oxygen Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[7DADMin= 7-Day Average of the Daily Minima, 7DADA= 7-Day Average of the Daily Average, CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Day Count	7day Count	30day Count	DO Min (mg/L)	Min 7DADMin (mg/L)	Min 7DADA (mg/L)	Delta DO Max (mg/L)	Count CW 7DADMin <6.0	Count CW 1Day Min <5.0	Count WW Early Life Stages 7DADA <6.5	Count WW Early Life Stages 1Day Min <5.0	Count WW Other Life Stages 7DADMin <5.0	Count WW Other Life Stages 1Day Min <4.0	Count CW 30DADA <8.0	Count WW Other Life Stages 30DADA <6.0
W2404	06/20/13	10/01/13	104	98	75	2.1	2.7	3.6	5.9	67	30	39	12	32	18	75	65

MassDEP Discrete Dissolved Oxygen Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
W2404	06/19/13	10/02/13	2	6.4	6.4	0	0	0

MassDEP Long-term Continuous Temperature Data (Summer Index 2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; Max Daily Mean= Maximum 24-Hour Average, 7DADM= 7-Day Average of the Daily Maxima, 7DADA= 7-Day Average of the Daily Average, CW= Coldwater, WW= Warmwater; NOTE: In the case of more than one row of data in the same year for a site, different types of temperature probes were deployed.]

Station Code	Start Date	End Date	Index Count	7day Count	Max Daily Mean (°C)	Max Temp (°C)	Max 7DADM (°C)	Max 7DADA (°C)	Count CWTier1 7DADM >20	Count CWTier1 Daily Mean >23.5	Count CWTier2 7DADA >21	Count CWTier2 Daily Mean >24.1	Count WW 7DADM >27.7	Count WW Daily Mean >28.3
W2404	06/20/13	09/15/13	88	85	26.6	27.2	26.6	25.9	81	21	50	16	0	0
W2404	06/20/13	09/15/13	88	85	26.6	27.2	26.5	25.9	81	21	48	16	0	0

24-hour Rolling Average Calculations for MassDEP Short- and Long-term Continuous Temperature Data (Summer Index 2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater; NOTE: In the case of more than one row of data in the same year for a site, different types of temperature probes were deployed.]

Station Code	Start Date	End Date	Count Days Deployed	24hr Rolling Count	Max 24hr Avg Rolling Temp (°C)	Count CWTier1 24hr Avg Rolling >23.5 °C	Count CWTier2 24hr Avg Rolling >24.1 °C	Count WW 24hr Avg Rolling >28.3°C
W2404	06/19/13	09/15/13	89	4203	26.6	997	771	0
W2404	06/19/13	09/15/13	89	4203	26.7	1007	775	0

MassDEP Discrete Temperature Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
W2404	06/19/13	10/02/13	5	3	22.5	18.6	2	1	0	0

MassDEP Discrete pH Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

Station Code	Start Date	End Date	pH Count	pH Min (SU)	pH Max (SU)	pH Count <6.5 & >8.3	pH Count <6.0 & >8.8
W2404	06/19/13	10/02/13	3	6.1	6.5	2	0

Buzzards Bay Coalition Freshwater Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Average Sample depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
BBC_PKR1	05/27/15	09/23/15	0.1	21	5.0	6.5	0	0	0
BBC_PKR1	05/31/16	09/24/16	0.1	20	3.5	5.1	8	5	1
BBC_PKR1	06/01/17	09/19/17	0.1	21	4.0	5.3	4	4	0
BBC_PKR1	06/11/18	09/20/18	0.1	13	4.2	5.9	2	2	0
BBC_PKR1	06/03/19	09/17/19	0.1	13	3.7	6.3	1	1	1

Buzzards Bay Coalition Discrete Freshwater Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_PKR1	05/27/15	09/23/15	0.1	24	21	23.0	19.3	5	1	0	0
BBC_PKR1	05/31/16	09/24/16	0.1	22	19	26.0	20.4	7	4	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_PKR1	07/18/16	07/18/16	0.2	1	1	24.0	24.0	1	1	0	0
BBC_PKR1	06/01/17	09/19/17	0.1	23	21	22.2	18.3	4	1	0	0
BBC_PKR1	06/11/18	09/20/18	0.1	16	15	22.8	20.2	7	4	0	0
BBC_PKR1	06/03/19	09/17/19	0.1	13	12	22.3	18.9	4	2	0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

MassDEP Nutrient Enrichment Indicator Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	Delta DO Max (mg/L)	Delta DO Avg (mg/L)	DO Sat Max (%)	pH Max (SU)	Count Algal Obsv.	Dense/V. Dense Film/Fila. Algae
W2404	2013	4	0.06	0.100	0.078	5.9	0.9	74.8	6.5	4	0

Buzzards Bay Coalition Freshwater Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	DO Sat Max (%)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count >16µg/L
BBC_PKR1	2015	0.1	4	0.017	0.051	0.039	--	4	0.55	1.36	1.01	0
BBC_PKR1	2016	0.2	1	0.011	0.011	0.011	--	1	1.78	1.78	1.78	0
BBC_PKR1	2016	0.1	2	0.015	0.015	0.015	--	2	3.71	9.03	6.37	0
BBC_PKR1	2017	0.2	2	0.013	0.015	0.014	--	2	0.32	1.78	1.05	0
BBC_PKR1	2018	0.2	3	0.009	0.015	0.013	--	3	1.03	1.65	1.36	0
BBC_PKR1	2019	0.1	2	0.040	0.059	0.050	--	2	0.64	1.03	0.84	0

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

MassDEP Clean Metals Water Column Data (2011-2018), Acute Criteria Violations. (MassDEP Undated11) (MassDEP Undated6)

[CMC= Criterion Maximum Concentration, TU= Toxic Unit]

Station Code	Data Year	Metals Count	As CMC TU >1	Cd CMC TU >1	Cr III CMC TU >1	Cu CMC TU >1	Pb CMC TU >1	Ni CMC TU >1	Ag CMC TU >1	Zn CMC TU >1
W2404	2013	3	0	0	0	1	0	0	0	0

MassDEP Clean Metals Water Column Data (2011-2018), Chronic Criteria Violations. (MassDEP Undated11) (MassDEP Undated6)

[CCC= Criterion Continuous Concentration, TU= Toxic Unit]

Station Code	Data Year	Metals Count	As CCC TU >1	Cd CCC TU >1	Cr III CCC TU >1	Cu CCC TU >1	Pb CCC TU >1	Ni CCC TU >1	Se CCC TU >1	Zn CCC TU >1
W2404	2013	3	0	2	0	2	3	0	0	0

MassDEP Clean Metals Water Column Data (2011-2018), Selected TU Calculations. (MassDEP Undated11) (MassDEP Undated6)

[CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

Station Code	Sample Date	Cd CMC TU	Cd CCC TU	Cu CMC TU	Cu CCC TU	Pb CMC TU	Pb CCC TU
W2404	06/04/13	0.8	1.6	1.3	1.67	0.1	2.7
W2404	07/16/13	0.6	1.1	0.9	1.26	0.1	2.4
W2404	08/26/13	0.3	0.6	0.4	0.49	0.0	1.1

MassDEP Dissolved Aluminum Water Column Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Since only dissolved aluminum data were available, these data were compared to the default freshwater criteria for total recoverable aluminum (TRA), presented in Appendix E of MassDEP's 2022 CALM. As dissolved Al is a fraction of TRA, an exceedance count of 0 does not rule out violations of the TRA criteria. CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

Station Code	Data Year	Dissolved Al Count	Al Min (mg/L)	Al Max (mg/L)	Al Avg (mg/L)	Al CMC TU Max	Al CCC TU Max	Al CMC TU >1	Al CCC TU >1
W2404	2013	3	0.140	0.23	0.190	0.5	1.0	0	0

MassDEP Total Ammonia Nitrogen (TAN) Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[TAN= NH₃ + NH₄⁺]

Station Code	Data Year	TAN Count	TAN Min (mg/L)	TAN Max (mg/L)	TAN Avg (mg/L)	Count TAN >Chronic	Count TAN >Acute
W2404	2013	3	0.030	0.090	0.057	0	0

MassDEP Chloride Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Chloride Count	Chloride Min (mg/L)	Chloride Max (mg/L)	Chloride Avg (mg/L)	Count Chloride >230	Count Chloride >860
W2404	2013	3	59	73	65	0	0

MassDEP Discrete Specific Conductance Data (2011-2018) Compared to Estimated Chloride Criteria. (MassDEP Undated11) (MassDEP Undated6)

Station Code	Start Date	End Date	SpCond Count	SpCond Min (µS/cm)	SpCond Max (µS/cm)	Count SpCond >904	Count SpCond >994	Count SpCond >3193	Count SpCond >3512	Consecutive sets >904	Consecutive sets >994
W2404	06/19/13	10/02/13	3	272	338	0	0	0	0	0	0

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_PKR1	07/13/15	08/25/15	0.1	4	0.061	0.161	0.112
BBC_PKR1	07/05/16	08/15/16	0.1	2	0.119	0.184	0.152
BBC_PKR1	07/18/16	07/18/16	0.2	1	0.156	0.156	0.156
BBC_PKR1	07/06/17	08/17/17	0.2	2	0.127	0.186	0.156
BBC_PKR1	07/10/18	08/21/18	0.2	3	0.082	0.160	0.123
BBC_PKR1	08/08/19	08/15/19	0.1	2	0.098	0.123	0.111

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
Although fish toxics sampling was done in Paskamanset River just upstream of Rt.6 in 1988, no site-specific fish consumption advisory was issued by DPH. The Fish Consumption Use for Paskamanset River (MA95-11) is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	
<p>MassDEP staff did field surveys for this Paskamanset River AU as part of the MAP2 monitoring project, in Dartmouth approximately 2500 ft downstream/south from Rt. 6 (State Road) (W2404) in the summer of 2013. There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by field sampling crews at this site (n=8).</p> <p>Based on this information, the Aesthetics Use for this Paskamanset River AU (MA95-11) is assessed as Fully Supporting. The Alert previously identified due to 1 observation of Objectionable Deposits just upstream of Rt.6 (W1376) in August 2005 (i.e., Orange floc covering 100% of bottom, on Moss) is being carried forward since there were no new surveys completed at that location in 2013.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2404	MassDEP	Water Quality	Paskamanset River	[approximately 2500 feet downstream/south from Route 6 (State Road), Dartmouth]	41.633384	-70.986022

Aesthetic Observations

Aesthetics Summary Statements for MassDEP Stations (2011-2018) (MassDEP Undated6)

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W2404	Paskamanset River	2013	8	MassDEP aesthetics observations for station W2404/MAP2-428 on Paskamanset River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013.

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W2404	2013	8	4	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W2404	Paskamanset River	2013	Color	Brownish	1	8
W2404	Paskamanset River	2013	Color	Light Yellow/Tan	1	8
W2404	Paskamanset River	2013	Color	Reddish	6	8
W2404	Paskamanset River	2013	Objectionable Deposits	No	7	8
W2404	Paskamanset River	2013	Objectionable Deposits	Yes	1	8
W2404	Paskamanset River	2013	Odor	None	8	8
W2404	Paskamanset River	2013	Scum	No	6	8
W2404	Paskamanset River	2013	Scum	Yes	2	8
W2404	Paskamanset River	2013	Turbidity	Moderately Turbid	1	8
W2404	Paskamanset River	2013	Turbidity	None	4	8
W2404	Paskamanset River	2013	Turbidity	Slightly Turbid	3	8

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
<p>MassDEP staff collected <i>E. coli</i> bacteria samples at this Paskamanset River AU (MA95-11) approximately 2500 ft downstream/south from Rt. 6 (State Rd) in Dartmouth (W2404) between May and September 2013 (n=5). Data analysis indicated that 100% of intervals had GM's >126 cfu/100 ml and 2 samples exceeded the 410 cfu/100 ml STV. The seasonal Geometric Mean was 772 cfu/100 ml. Since the <i>E. coli</i> concentrations exceeded the use attainment impairment threshold for this single year low frequency dataset, the Primary Contact Recreational Use for this Paskamanset River AU (MA95-11) will continue to be assessed as Not Supporting, with the impairments for <i>E. coli</i> and <i>Enterococcus</i> being carried forward.</p> <p>The Alert previously identified due to 1 observation of Objectionable Deposits just upstream of Rt.6 (W1376) in August 2005 (i.e., Orange floc covering 100% of bottom, on Moss) is being carried forward since there were no new surveys completed at that location in 2013.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2404	MassDEP	Water Quality	Paskamanset River	[approximately 2500 feet downstream/south from Route 6 (State Road), Dartmouth]	41.633384	-70.986022

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP Undated11) (MassDEP Undated6)

[Result units are CFU/100ml or MPN/100ml]

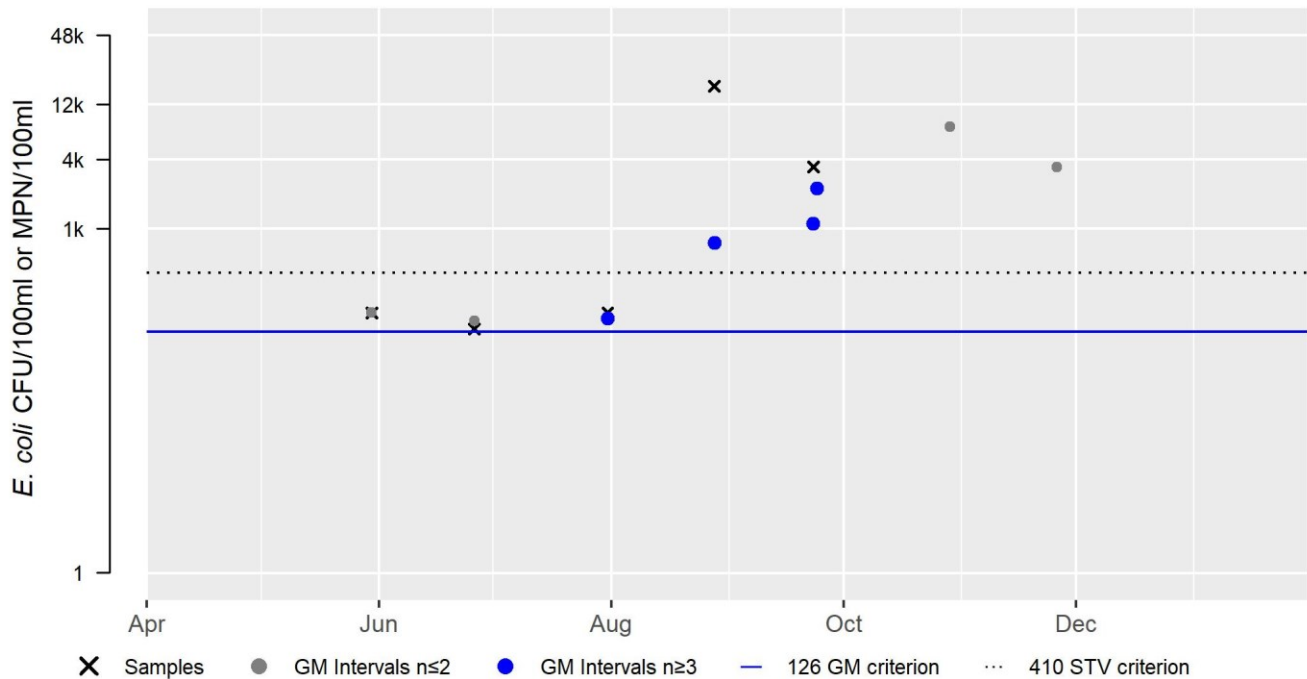
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
W2404	MassDEP	E. coli	05/30/13	09/23/13	5	134	17330	772

W2404 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	5
SeasGM	772
#GMI	4
#GMI Ex	4
%GMI Ex	100
n>STV	2
%n>STV	40

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2013



Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	

MassDEP staff collected *E. coli* bacteria samples at this Paskamanset River AU (MA95-11) approximately 2500 ft downstream/south from Rt. 6 (State Rd) in Dartmouth (W2404) between May and September 2013 (n=5). Data analysis indicated that 75% of intervals had GM's >630 cfu/100 ml, 2 samples exceeded the 1260 cfu/100 ml STV and the seasonal GM was 772 cfu/100 ml.

Since the *E. coli* concentrations exceeded the use attainment impairment threshold for this single year low frequency dataset, the Secondary Contact Recreational Use for this Paskamanset River AU (MA95-11) is assessed as Not Supporting. The Alert previously identified due to 1 observation of Objectionable Deposits just upstream of Rt. 6 (W1376) in August 2005 (i.e., Orange floc covering 100% of bottom, on Moss) is being carried forward since there were no new surveys completed at that location in 2013.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2404	MassDEP	Water Quality	Paskamanset River	[approximately 2500 feet downstream/south from Route 6 (State Road), Dartmouth]	41.633384	-70.986022

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP Undated11) (MassDEP Undated6)

[Result units are CFU/100ml or MPN/100ml]

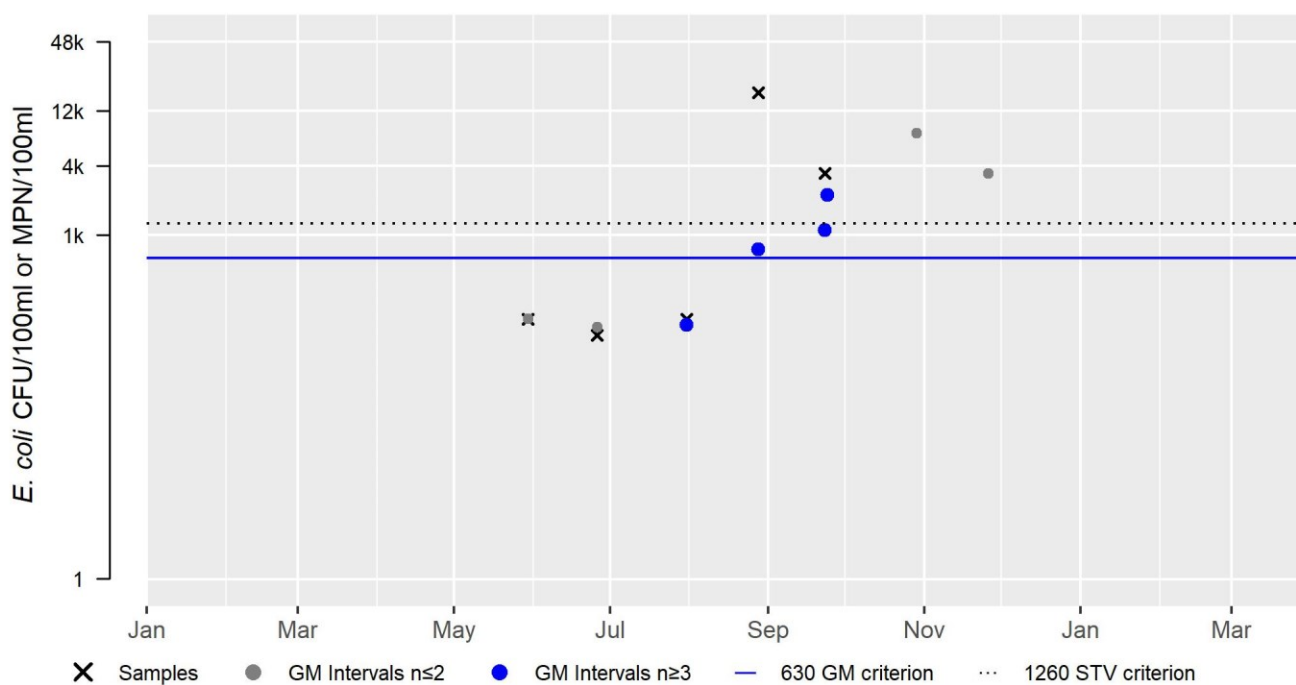
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
W2404	MassDEP	E. coli	05/30/13	09/23/13	5	134	17330	772

W2404 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	5
SeasGM	772
#GMI	4
#GMI Ex	3
%GMI Ex	75
n>STV	2
%n>STV	40

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2013



Phinneys Harbor (MA95-15)

Location:	From the confluence with the Back River, to the mouth at Buzzards Bay (demarcated by a line from the southeastern point of Mashnee Island to the northwestern point of Tobys Island), Bourne (includes the "north facing embayment of Tobys Island").
AU Type:	ESTUARY
AU Size:	0.72 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Estuarine Bioassessments	35069	Unchanged
4a	4a	Fecal Coliform	36172	Unchanged
4a	4a	Nitrogen, Total	35069	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					

Recommendations

2022 Recommendations
ALU: Continue to conduct total nitrogen sampling (at least three times per season at mid-ebb tide), to confirm the need to continue the Total Nitrogen impairment for this Phinneys Harbor AU (MA95-15). Monitor the AU for improvements.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an ~13% loss of eelgrass bed habitat in Buzzards Bay between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at five locations in Phinneys Harbor, Bourne (MA95-15) in the summers of 2015-2019, from inner to outer as follows: just off Phinneys Point (BBC_PH5), a little further out in the harbor (BBC_PH6), and then working down the eastern shore of the AU (BBC_PH4, PH3, and PH2). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at BBC_PH6 and PH2 (at depths ranging 1.1-2.5m), and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 28°C (n=250). The minimum dissolved oxygen (DO) concentration (most data at BBC_PH2) was 2mg/L (n=189); <6.0mg/L 47 times (~25% of the measurements overall) and <5.0mg/L 13 times (7% of the measurements overall), with excursions from the 6.0mg/L criterion occurring at the surface and at depth. The minimum DO at all other sampling sites, however, were almost all >6.0mg/L. Total nitrogen sampling (n=50) (ebb tides in July and August) documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.3-0.43mg/L (>0.4mg/L in 2018 at BBC_PH2 and BBC_PH5). The maximum chlorophyll *a* concentration was 17.65µg/L (n=100), >5µg/L 35 times but >10µg/L just twice. Secchi disk depth measurements taken weekly at BBC_PH2 and at least once or twice a year at all the sample locations in the summers of 2015-2019 (n=120) ranged from 1.3 to 3.3m throughout the harbor. Ammonia-nitrogen concentrations were generally low (range 0.004 to 0.03mg/L, n=100) but TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for Phinneys Harbor (MA95-15) will continue to be assessed as Not Supporting based on the loss of eelgrass bed habitat documented by the MassDEP between 1995 and 2017 and water quality data collected by BBC staff/volunteers between 2015 and 2019. The Estuarine Bioassessments and Total Nitrogen impairments are both being carried forward and an Aleert is being identified for low DO.

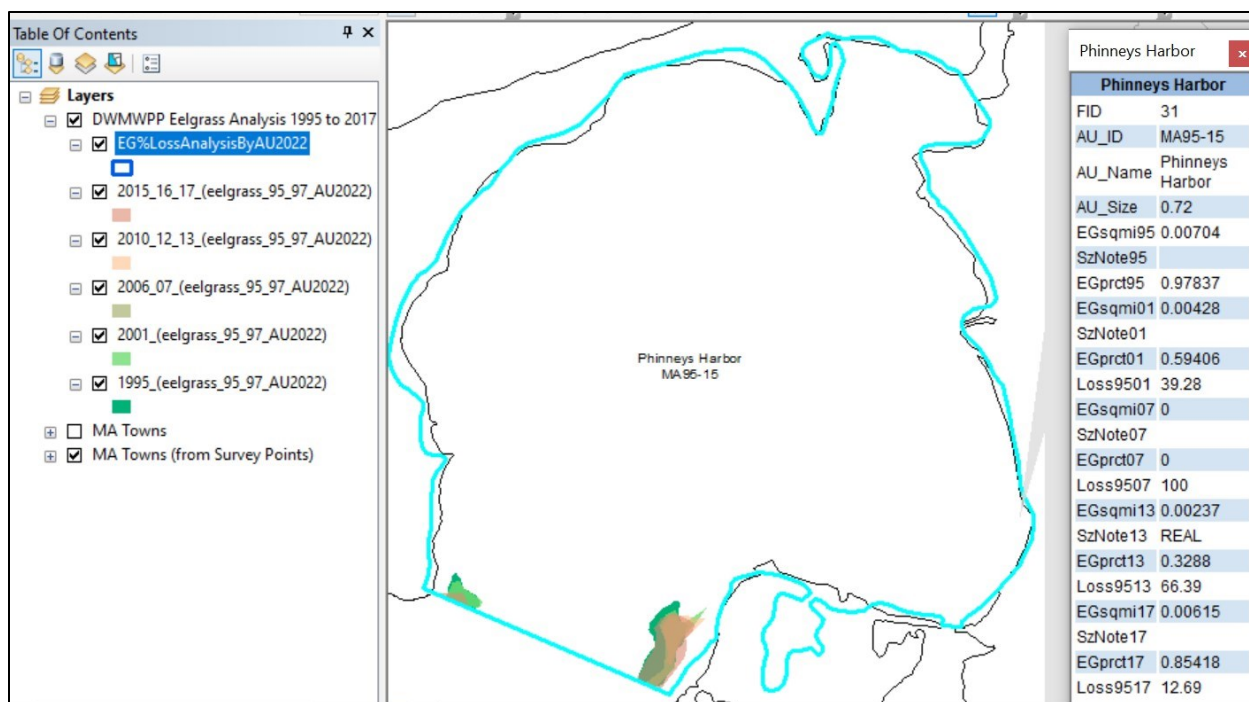
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_PH2	Buzzards Bay Coalition	Water Quality	Phinneys Harbor	Phinneys Harbor, Bourne	41.715023	-70.616737
BBC_PH3	Buzzards Bay Coalition	Water Quality	Phinneys Harbor	Phinneys Harbor, Bourne	41.717597	-70.616595
BBC_PH4	Buzzards Bay Coalition	Water Quality	Phinneys Harbor	Phinneys Harbor, Bourne	41.720721	-70.61745
BBC_PH5	Buzzards Bay Coalition	Water Quality	Phinneys Harbor	Phinneys Harbor, Bourne	41.724194	-70.619632
BBC_PH6	Buzzards Bay Coalition	Water Quality	Phinneys Harbor	Phinneys Harbor, Bourne	41.722623	-70.625235

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Phinneys Harbor MA95-15 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~13% loss of eelgrass bed habitat in Phinneys Harbor between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_PH2	05/29/15	09/14/15	0.2	21	2.0	6.4	48	14	14
BBC_PH2	05/29/15	09/14/15	2.2	23	2.0	6.3	48	22	13
BBC_PH2	06/28/16	08/24/16	0.2	6	5.6	6.1	50	0	0
BBC_PH2	06/28/16	08/24/16	2.0	6	5.1	6.0	33	0	0
BBC_PH2	05/31/17	09/12/17	0.2	23	5.0	7.0	4	0	0
BBC_PH2	05/31/17	09/12/17	2.1	19	5.0	6.8	21	0	0
BBC_PH2	06/05/18	09/19/18	0.2	19	4.0	6.2	26	11	0
BBC_PH2	05/30/18	09/19/18	2.1	12	4.5	6.0	50	8	0
BBC_PH2	05/30/19	09/23/19	0.2	22	3.5	6.5	9	5	5
BBC_PH2	06/21/19	09/23/19	2.2	17	3.5	6.3	12	6	6
BBC_PH3	07/06/17	08/17/17	0.2	4	6.5	7.2	0	0	0
BBC_PH3	07/10/18	07/10/18	0.2	1	7.1	7.1	0	0	0
BBC_PH4	07/06/17	08/17/17	0.2	4	7.1	7.5	0	0	0
BBC_PH4	07/10/18	07/10/18	0.2	1	7.0	7.0	0	0	0
BBC_PH5	07/06/17	08/17/17	0.2	4	5.5	6.3	25	0	0
BBC_PH5	07/10/18	07/10/18	0.2	1	6.9	6.9	0	0	0
BBC_PH6	07/06/17	08/17/17	0.2	5	7.3	7.7	0	0	0
BBC_PH6	07/10/18	07/10/18	0.2	1	6.8	6.8	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_PH2	05/29/15	09/14/15	0.2	25	24	25.0	21.3	0
BBC_PH2	05/29/15	09/14/15	2.3	21	20	25.0	21.0	0
BBC_PH2	06/28/16	08/24/16	0.2	9	9	28.0	24.3	0
BBC_PH2	06/28/16	08/24/16	2.0	6	6	26.3	24.1	0
BBC_PH2	05/31/17	09/12/17	0.2	23	22	25.5	21.1	0
BBC_PH2	05/31/17	09/12/17	2.1	19	18	24.3	20.6	0
BBC_PH2	06/05/18	09/19/18	0.2	22	21	27.0	21.9	0
BBC_PH2	05/30/18	09/19/18	2.0	12	10	24.0	20.6	0
BBC_PH2	05/30/19	09/23/19	0.2	26	23	27.0	22.0	0
BBC_PH2	06/21/19	09/23/19	2.2	18	16	26.0	22.4	0
BBC_PH3	07/13/15	08/25/15	0.2	4	4	23.0	22.3	0
BBC_PH3	07/05/16	08/15/16	0.2	3	3	28.0	25.0	0
BBC_PH3	07/06/17	08/17/17	0.2	4	4	24.8	23.4	0
BBC_PH3	07/10/18	08/21/18	0.2	4	4	27.0	24.6	0
BBC_PH3	07/11/19	08/15/19	0.2	4	4	25.0	23.5	0
BBC_PH4	07/13/15	08/25/15	0.2	4	4	23.0	22.3	0
BBC_PH4	07/05/16	08/15/16	0.2	3	3	28.0	25.0	0
BBC_PH4	07/06/17	08/17/17	0.2	4	4	25.4	23.7	0
BBC_PH4	07/10/18	08/21/18	0.2	4	4	28.0	24.8	0
BBC_PH4	07/11/19	08/15/19	0.2	4	4	25.0	23.3	0
BBC_PH5	07/13/15	08/25/15	0.2	4	4	23.0	21.8	0
BBC_PH5	07/05/16	08/15/16	0.2	3	3	28.0	25.2	0
BBC_PH5	07/06/17	08/17/17	0.2	4	4	25.5	23.8	0
BBC_PH5	07/10/18	08/21/18	0.2	4	4	28.0	24.9	0
BBC_PH5	07/11/19	08/15/19	0.2	4	4	25.0	23.8	0
BBC_PH6	07/13/15	08/25/15	0.2	4	4	23.0	22.5	0
BBC_PH6	07/13/15	08/25/15	2.5	4	4	23.0	22.5	0
BBC_PH6	07/05/16	08/15/16	0.2	3	3	28.0	25.0	0
BBC_PH6	08/01/16	08/01/16	1.1	1	1	24.5	24.5	0
BBC_PH6	07/06/17	08/17/17	0.2	4	4	25.3	23.6	0
BBC_PH6	07/10/18	08/21/18	0.2	4	4	27.0	24.5	0
BBC_PH6	07/11/19	08/15/19	0.2	4	4	28.0	24.3	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)**Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_PH2	2015	0.2	3	0.30	0.33	0.31	4	4.61	6.26	5.11	3	0
BBC_PH2	2016	0.2	--	--	--	--	3	4.08	6.07	5.31	1	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_PH2	2017	0.2	2	0.27	0.41	0.34	4	2.44	6.18	4.23	2	0
BBC_PH2	2018	0.2	4	0.35	0.55	0.43	4	3.18	5.20	4.23	3	0
BBC_PH2	2019	0.2	4	0.34	0.39	0.36	4	4.38	6.16	5.24	2	0
BBC_PH3	2015	0.2	3	0.29	0.32	0.30	4	4.73	6.49	5.76	1	0
BBC_PH3	2016	0.2	2	0.31	0.31	0.31	3	3.68	5.07	4.56	2	0
BBC_PH3	2017	0.2	1	0.51	0.51	0.51	4	4.25	17.65	8.79	1	1
BBC_PH3	2018	0.2	2	0.37	0.37	0.37	4	2.40	4.52	3.59	4	0
BBC_PH3	2019	0.2	2	0.31	0.31	0.31	4	4.25	9.78	7.01	1	0
BBC_PH4	2015	0.2	3	0.28	0.32	0.31	4	3.68	5.11	4.59	3	0
BBC_PH4	2016	0.2	--	--	--	--	3	2.79	9.66	5.33	2	0
BBC_PH4	2017	0.2	1	0.39	0.39	0.39	4	3.33	4.51	3.72	4	0
BBC_PH4	2018	0.2	2	0.34	1.01	0.68	4	4.01	10.13	5.64	3	1
BBC_PH4	2019	0.2	--	--	--	--	4	3.34	7.42	5.80	1	0
BBC_PH5	2015	0.2	3	0.30	0.32	0.31	4	1.56	7.60	4.45	3	0
BBC_PH5	2016	0.2	2	0.38	0.38	0.38	3	1.97	3.77	2.95	3	0
BBC_PH5	2017	0.2	4	0.31	0.48	0.40	4	2.91	5.57	4.19	3	0
BBC_PH5	2018	0.2	4	0.33	0.55	0.43	4	2.57	5.26	3.58	3	0
BBC_PH5	2019	0.2	3	0.36	0.42	0.38	4	0.28	5.73	3.47	3	0
BBC_PH6	2015	0.2	1	0.30	0.30	0.30	4	3.13	5.82	4.38	2	0
BBC_PH6	2015	2.5	1	0.33	0.33	0.33	4	3.58	5.16	4.68	2	0
BBC_PH6	2016	0.2	2	0.26	0.35	0.31	3	2.35	4.19	3.50	3	0
BBC_PH6	2016	1.1	--	--	--	--	1	2.75	2.75	2.75	1	0
BBC_PH6	2017	0.2	--	--	--	--	4	3.72	4.71	4.27	4	0
BBC_PH6	2018	0.2	1	0.35	0.35	0.35	4	2.95	5.11	3.99	3	0
BBC_PH6	2019	0.2	--	--	--	--	4	2.98	8.02	5.36	2	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_PH2	05/29/15	09/14/15	22	1.6	2.8	2.2
BBC_PH2	06/28/16	08/03/16	5	1.8	2.7	2.2
BBC_PH2	06/05/17	09/06/17	16	1.5	3.1	2.2
BBC_PH2	05/30/18	09/19/18	15	1.3	2.6	1.9
BBC_PH2	05/30/19	09/14/19	17	1.5	2.7	2.1
BBC_PH3	07/13/15	08/10/15	3	1.5	2.1	1.9
BBC_PH3	07/05/16	08/01/16	2	1.7	2.3	2.0
BBC_PH3	07/06/17	07/20/17	2	2.0	3.0	2.5
BBC_PH3	07/11/19	08/15/19	3	1.8	2.5	2.2
BBC_PH4	07/13/15	08/25/15	4	2.2	2.5	2.4
BBC_PH4	07/05/16	08/15/16	2	1.7	2.8	2.3
BBC_PH4	07/06/17	07/20/17	2	2.0	3.2	2.6

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_PH4	07/11/19	08/15/19	4	2.0	2.6	2.2
BBC_PH5	07/13/15	08/25/15	4	2.0	2.5	2.2
BBC_PH5	07/05/16	08/01/16	2	2.0	2.3	2.1
BBC_PH5	07/06/17	08/03/17	3	2.1	3.0	2.4
BBC_PH5	07/11/19	08/15/19	4	1.9	2.6	2.3
BBC_PH6	07/13/15	08/25/15	4	2.3	2.6	2.5
BBC_PH6	08/15/16	08/15/16	1	2.6	2.6	2.6
BBC_PH6	07/06/17	08/03/17	3	2.3	3.3	2.7
BBC_PH6	07/25/19	08/15/19	2	2.3	2.4	2.4

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_PH2	07/13/15	08/25/15	0.2	4	0.009	0.018	0.013
BBC_PH2	07/05/16	08/15/16	0.2	3	0.009	0.014	0.011
BBC_PH2	07/06/17	08/17/17	0.2	4	0.004	0.009	0.006
BBC_PH2	07/10/18	08/21/18	0.2	4	0.006	0.017	0.011
BBC_PH2	07/11/19	08/15/19	0.2	4	0.008	0.024	0.016
BBC_PH3	07/13/15	08/25/15	0.2	4	0.009	0.012	0.011
BBC_PH3	07/05/16	08/15/16	0.2	3	0.004	0.007	0.005
BBC_PH3	07/06/17	08/17/17	0.2	4	0.004	0.007	0.005
BBC_PH3	07/10/18	08/21/18	0.2	4	0.004	0.010	0.006
BBC_PH3	07/11/19	08/15/19	0.2	4	0.004	0.004	0.004
BBC_PH4	07/13/15	08/25/15	0.2	4	0.010	0.013	0.012
BBC_PH4	07/05/16	08/15/16	0.2	3	0.005	0.009	0.007
BBC_PH4	07/06/17	08/17/17	0.2	4	0.004	0.008	0.005
BBC_PH4	07/10/18	08/21/18	0.2	4	0.004	0.027	0.011
BBC_PH4	07/11/19	08/15/19	0.2	4	0.004	0.006	0.005
BBC_PH5	07/13/15	08/25/15	0.2	4	0.012	0.027	0.020
BBC_PH5	07/05/16	08/15/16	0.2	3	0.008	0.024	0.017
BBC_PH5	07/06/17	08/17/17	0.2	4	0.006	0.020	0.012
BBC_PH5	07/10/18	08/21/18	0.2	4	0.007	0.033	0.018
BBC_PH5	07/11/19	08/15/19	0.2	4	0.011	0.028	0.018
BBC_PH6	07/13/15	08/25/15	0.2	4	0.006	0.018	0.011
BBC_PH6	07/13/15	08/25/15	2.5	4	0.006	0.013	0.010
BBC_PH6	07/05/16	08/15/16	0.2	3	0.009	0.018	0.013
BBC_PH6	08/01/16	08/01/16	1.1	1	0.006	0.006	0.006
BBC_PH6	07/06/17	08/17/17	0.2	4	0.004	0.008	0.005
BBC_PH6	07/10/18	08/21/18	0.2	4	0.004	0.010	0.006
BBC_PH6	07/11/19	08/15/19	0.2	4	0.004	0.006	0.005

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Pinneys Harbor (MA95-15); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Pinneys Harbor (MA95-15): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.69 sq mi (95%). The approved shellfish growing area represents 0.3259 sq mi (45%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB46.0	Pinneys Harbor	Approved	0.32586	45.0%
BB46.1	Monument Beach	Conditionally Approved	0.09751	13.5%
BB46.3	Mashnee Road	Conditionally Approved	0.23377	32.3%
BB47.1	Back River	Conditionally Approved	0.03287	4.5%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Pinneys Harbor (MA95-15) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There is one beach in Pinneys Harbor, Bourne known as Monument (ID 2656). This beach was never posted with any swimming advisories between 2014 and 2019. The Primary Contact Recreational Use for Pinneys Harbor (MA95-15) is assessed as Fully Supporting since there were no swimming advisory postings at the Monument Beach between 2014 and 2019.	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2656	Monument/Bourne	41.71595	-70.61490	41.71366	-70.61720	0%	0%	0%	0%	0%	0%	0

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Phinneys Harbor (MA95-15): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.69 sq mi (95%). The approved shellfish growing area represents 0.3259 sq mi (45%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There is one beach in Phinneys Harbor, Bourne known as Monument (ID 2656). This beach was never posted with any swimming advisories between 2014 and 2019. The Secondary Contact Recreational Use for Phinneys Harbor (MA95-15) is assessed as Fully Supporting since there were no swimming advisory postings at the Monument Beach between 2014 and 2019.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Phinneys Harbor (MA95-15): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.69 sq mi (95%). The approved shellfish growing area represents 0.3259 sq mi (45%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Pocasset Harbor (MA95-17)

Location:	From the confluence with Red Brook Harbor near the northern portion of Bassett's Island and Patuisset, Bourne to the mouth at Buzzards Bay between the western portion of Bassett's Island and Wings Neck, Bourne.
AU Type:	ESTUARY
AU Size:	0.33 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Dissolved Oxygen		Added
5	5	Estuarine Bioassessments		Unchanged
5	5	Fecal Coliform	36172	Unchanged
5	5	Nitrogen, Total		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Source Unknown (N)	X					
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Source Unknown (N)	X					

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an ~79% loss of eelgrass bed habitat in Pocasset Harbor between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at six locations in Pocasset Harbor, Bourne (MA95-17) in the summers of 2015-2019, from inner to outer as follows: at the north/inner end (BBC_PC5 and PC6), from a dock off Barlows Landing beach-east shore (BBC_PC1), in the middle/open waters of the AU-north of Bassetts Island (BBC_PC2), in a marsh area on the east shore (BBC_PHM2), and close to the mouth of the harbor (BBC_PC3). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at BBC_PC1, PC2, and PC3 (at depths ranging 1.4-2.9m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 30.0°C (n=398); >29.4°C just once in 2016 at BBC_PC1. The minimum dissolved oxygen (DO) was 2.5mg/L (n=339), <6.0mg/L 84 times (~25% of all measurements) and <5.0mg/L 37 times (~11% of all measurements). The excursions from the 6.0mg/L criterion occurred most frequently (and severely) in the inner harbor (BBC_PC1) at both surface and depth. Total nitrogen sampling (n=71, maximum 1.67mg/L) during ebb tides in July and August documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.32-0.83mg/L, with the highest averages documented at the Pocasset Heights Marsh location (BBC_PHM2), though the averages at the inner harbor locations (BBC_PC1 and PC5) were usually also always >0.4mg/L (the MEP Critical Indicator Threshold). The maximum Chlorophyll *a* was 11.6µg/L (n=124); >5µg/L 40 times and >10µg/L only once. Secchi disk depths in Pocasset Harbor in the summers of 2015-2019, ranged from 0.7 to 3.5m (n=168). Ammonia-nitrogen concentrations were low (range 0.004 to 0.09mg/L, n=124), but TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for Pocasset Harbor (MA95-17) will continue to be assessed as Not Supporting based on the loss of eelgrass bed habitat documented by the MassDEP Eelgrass Mapping Project between 1995 and 2017 and the data collected by BBC staff/volunteers in 2015-2019 which are indicative of poor water quality conditions particularly in the inner harbor. The Estuarine Bioassessments impairment is being carried forward and impairments for Total Nitrogen and Dissolved Oxygen are being added.

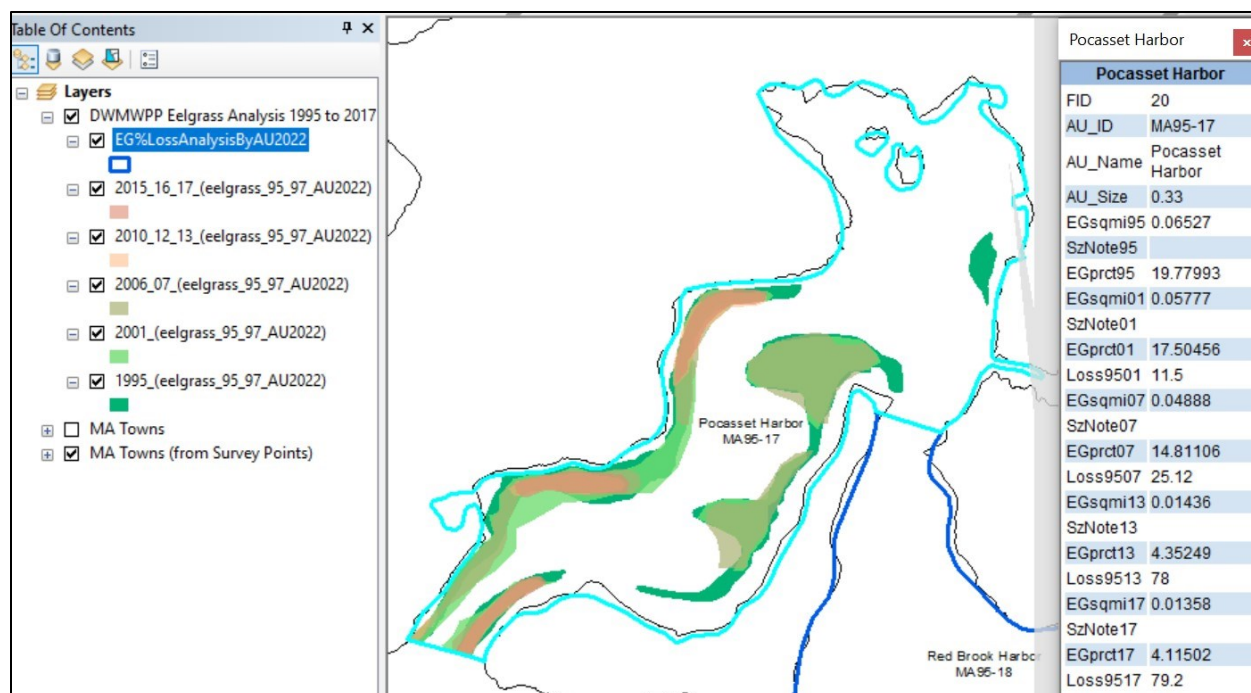
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_PC1	Buzzards Bay Coalition	Water Quality	Pocasset Harbor	Pocasset Harbor Inner, Bourne	41.691059	-70.627264
BBC_PC2	Buzzards Bay Coalition	Water Quality	Pocasset Harbor	Pocasset Harbor Outer, Bourne	41.688188	-70.6322
BBC_PC3	Buzzards Bay Coalition	Water Quality	Pocasset Harbor	Pocasset Harbor Outer, Bourne	41.683556	-70.64272
BBC_PC5	Buzzards Bay Coalition	Water Quality	Pocasset Harbor	Pocasset Harbor Inner, Bourne	41.692905	-70.628629
BBC_PC6	Buzzards Bay Coalition	Water Quality	Pocasset Harbor	Pocasset Harbor Inner, Bourne	41.692509	-70.632202
BBC_PHM2	Buzzards Bay Coalition	Water Quality	Pocasset Heights Marsh	Pocasset Heights Marsh, Bourne	41.687376	-70.627104

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Pocasset Harbor MA95-17 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~79% loss of eelgrass bed habitat in Pocasset Harbor between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_PC1	06/10/15	08/27/15	0.2	11	4.4	6.0	45	9	0
BBC_PC1	06/10/15	08/27/15	1.5	11	5.3	6.2	27	0	0
BBC_PC1	06/28/16	09/24/16	0.2	12	2.5	4.4	83	58	33
BBC_PC1	06/28/16	09/24/16	1.4	11	2.5	4.4	82	73	27
BBC_PC1	06/17/17	09/20/17	0.2	15	4.0	5.0	73	53	0
BBC_PC1	06/17/17	09/20/17	1.6	16	4.0	5.1	63	31	0
BBC_PC1	06/10/18	09/14/18	0.2	17	4.5	5.7	47	24	0
BBC_PC1	06/10/18	09/14/18	1.9	18	4.5	5.9	44	6	0
BBC_PC1	05/30/19	09/24/19	0.2	23	5.0	6.7	35	0	0
BBC_PC1	06/20/19	09/15/19	2.3	12	5.5	6.4	33	0	0
BBC_PC2	08/10/16	08/10/16	0.2	1	6.1	6.1	0	0	0
BBC_PC2	08/10/16	08/10/16	1.2	1	5.9	5.9	100	0	0
BBC_PC3	05/29/15	09/14/15	0.2	11	7.0	8.1	0	0	0
BBC_PC3	05/29/15	09/23/15	2.4	22	7.0	8.1	0	0	0
BBC_PC3	05/31/16	09/24/16	0.2	17	5.9	8.0	6	0	0
BBC_PC3	06/06/16	09/24/16	2.2	19	4.5	7.6	5	5	0
BBC_PC3	06/12/17	09/16/17	0.2	13	6.5	7.7	0	0	0
BBC_PC3	05/31/17	09/19/17	2.2	22	6.5	7.5	0	0	0
BBC_PC3	06/11/18	09/19/18	0.2	16	4.0	7.1	6	6	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_PC3	05/30/18	09/19/18	2.3	23	6.0	7.6	0	0	0
BBC_PC3	05/30/19	09/23/19	0.2	22	7.0	8.1	0	0	0
BBC_PC3	05/30/19	09/23/19	2.8	22	6.5	8.2	0	0	0
BBC_PHM2	07/13/15	08/25/15	0.1	4	3.0	6.5	25	25	25

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_PC1	06/10/15	08/27/15	0.2	15	15	26.6	23.8	0
BBC_PC1	06/10/15	08/27/15	1.5	11	11	26.8	23.5	0
BBC_PC1	06/28/16	09/24/16	0.2	16	14	30.0	25.3	1
BBC_PC1	06/28/16	09/24/16	1.4	11	9	27.0	24.9	0
BBC_PC1	06/17/17	09/20/17	0.2	19	18	25.0	21.9	0
BBC_PC1	06/17/17	09/20/17	1.6	15	14	23.6	21.4	0
BBC_PC1	06/10/18	09/14/18	0.2	21	21	27.2	22.7	0
BBC_PC1	06/10/18	09/14/18	1.9	17	17	25.2	22.1	0
BBC_PC1	05/30/19	09/24/19	0.2	27	23	27.0	22.5	0
BBC_PC1	06/20/19	09/15/19	2.3	12	12	27.0	23.1	0
BBC_PC2	07/13/15	08/25/15	0.2	4	4	26.0	25.0	0
BBC_PC2	07/13/15	08/25/15	2.1	4	4	27.0	24.8	0
BBC_PC2	07/05/16	08/15/16	0.4	6	6	28.0	26.1	0
BBC_PC2	07/05/16	08/15/16	1.9	4	4	27.0	26.3	0
BBC_PC2	07/06/17	08/17/17	0.2	4	4	25.0	23.3	0
BBC_PC2	07/06/17	08/17/17	2.2	4	4	24.3	23.6	0
BBC_PC2	07/10/18	08/21/18	0.2	4	4	27.2	25.1	0
BBC_PC2	07/10/18	08/21/18	2.0	4	4	26.1	24.7	0
BBC_PC2	07/11/19	08/15/19	0.2	4	4	25.0	24.3	0
BBC_PC3	05/29/15	09/14/15	0.2	15	14	26.0	22.9	0
BBC_PC3	05/29/15	09/23/15	2.4	21	18	25.0	21.9	0
BBC_PC3	05/31/16	09/24/16	0.2	21	18	28.0	22.7	0
BBC_PC3	06/06/16	09/24/16	2.2	19	16	26.0	23.1	0
BBC_PC3	06/12/17	09/16/17	0.2	17	16	24.0	21.8	0
BBC_PC3	05/31/17	09/19/17	2.3	21	18	25.0	21.2	0
BBC_PC3	06/11/18	09/19/18	0.2	20	19	26.7	20.2	0
BBC_PC3	05/30/18	09/19/18	2.3	22	19	22.0	18.5	0
BBC_PC3	07/11/19	09/23/19	0.2	14	12	26.0	23.6	0
BBC_PC3	08/01/19	09/23/19	2.9	10	8	29.0	23.5	0
BBC_PC5	07/13/15	08/25/15	0.2	4	4	27.0	25.3	0
BBC_PC5	07/05/16	08/15/16	0.2	4	4	29.0	27.1	0
BBC_PC5	07/06/17	08/17/17	0.2	4	4	25.0	23.5	0
BBC_PC5	07/10/18	08/21/18	0.2	4	4	26.7	24.4	0
BBC_PC5	07/11/19	08/15/19	0.2	4	4	25.0	24.0	0
BBC_PC6	07/13/15	08/25/15	0.2	4	4	26.0	24.6	0
BBC_PC6	07/05/16	08/15/16	0.2	4	4	28.0	26.0	0
BBC_PC6	07/06/17	08/17/17	0.2	4	4	25.0	23.8	0
BBC_PC6	07/10/18	08/21/18	0.2	4	4	26.7	24.3	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_PC6	07/11/19	08/15/19	0.2	4	4	25.0	24.3	0
BBC_PHM2	07/13/15	08/25/15	0.1	4	4	24.0	23.5	0
BBC_PHM2	07/05/16	08/15/16	0.2	4	4	26.0	25.0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_PC1	2015	0.2	3	0.30	0.66	0.45	4	3.80	5.17	4.54	3	0
BBC_PC1	2016	0.2	2	0.40	0.41	0.41	4	4.72	8.72	6.57	1	0
BBC_PC1	2017	0.2	3	0.37	0.54	0.45	4	5.24	7.03	6.32	0	0
BBC_PC1	2018	0.2	4	0.33	0.51	0.44	4	3.59	11.61	6.59	2	1
BBC_PC1	2019	0.2	3	0.44	0.50	0.47	4	0.27	7.86	5.04	1	0
BBC_PC2	2015	0.2	1	0.27	0.27	0.27	4	2.81	5.22	3.78	3	0
BBC_PC2	2015	2.2	2	0.28	0.33	0.30	4	3.66	4.38	3.96	4	0
BBC_PC2	2016	0.5	--	--	--	--	5	3.88	5.14	4.47	4	0
BBC_PC2	2016	2.1	1	0.42	0.42	0.42	3	4.61	5.83	5.19	1	0
BBC_PC2	2017	0.2	3	0.34	0.42	0.39	4	3.26	6.44	4.94	2	0
BBC_PC2	2017	1.9	2	0.36	0.54	0.45	4	4.39	5.57	4.96	2	0
BBC_PC2	2018	0.2	4	0.32	0.45	0.40	4	1.45	3.86	2.76	4	0
BBC_PC2	2018	1.9	3	0.31	0.45	0.39	4	3.03	3.87	3.58	4	0
BBC_PC2	2019	0.2	1	0.31	0.31	0.31	4	2.98	5.43	4.29	3	0
BBC_PC3	2015	0.2	1	0.27	0.27	0.27	4	2.64	4.95	3.85	4	0
BBC_PC3	2016	0.2	--	--	--	--	4	3.53	4.49	3.90	4	0
BBC_PC3	2017	0.2	2	0.39	0.45	0.42	4	4.78	5.91	5.40	1	0
BBC_PC3	2018	0.2	3	0.31	0.42	0.35	4	2.57	3.96	3.40	4	0
BBC_PC3	2019	0.2	2	0.30	0.37	0.33	4	0.22	4.43	2.13	4	0
BBC_PC5	2015	0.2	3	0.31	0.33	0.32	4	3.84	5.46	4.86	2	0
BBC_PC5	2016	0.2	1	0.38	0.38	0.38	4	3.20	6.66	5.29	2	0
BBC_PC5	2017	0.2	4	0.48	0.69	0.56	4	2.21	8.29	5.73	1	0
BBC_PC5	2018	0.2	3	0.31	0.53	0.44	4	3.50	6.41	4.51	3	0
BBC_PC5	2019	0.2	3	0.41	0.52	0.45	4	3.16	6.25	4.96	2	0
BBC_PC6	2015	0.2	2	0.26	0.37	0.32	4	3.62	5.96	4.29	3	0
BBC_PC6	2016	0.2	1	0.48	0.48	0.48	4	3.21	5.77	4.32	3	0
BBC_PC6	2017	0.2	2	0.47	0.52	0.50	4	4.52	6.77	5.34	2	0
BBC_PC6	2018	0.2	4	0.38	0.48	0.42	4	3.71	4.45	3.93	4	0
BBC_PC6	2019	0.2	--	--	--	--	4	3.77	8.66	5.03	3	0
BBC_PHM2	2015	0.1	4	0.34	1.67	0.83	4	2.35	3.70	2.94	4	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_PHM2	2016	0.2	4	0.38	1.02	0.58	4	2.77	3.38	3.10	4	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_PC1	07/02/15	08/27/15	9	1.1	2.4	1.7
BBC_PC1	07/05/16	09/01/16	5	1.0	2.3	1.4
BBC_PC1	06/17/17	09/20/17	11	1.0	2.3	1.7
BBC_PC1	06/20/18	08/31/18	16	1.1	2.4	1.8
BBC_PC1	06/20/19	09/15/19	19	1.3	2.8	1.8
BBC_PC2	07/13/15	08/25/15	4	1.5	1.7	1.6
BBC_PC2	07/05/16	08/15/16	4	1.3	1.5	1.4
BBC_PC2	07/06/17	08/03/17	3	1.2	1.6	1.4
BBC_PC2	07/10/18	08/21/18	4	1.4	1.7	1.6
BBC_PC2	07/11/19	08/15/19	4	1.8	2.2	2.0
BBC_PC3	05/29/15	09/14/15	11	1.6	3.0	2.3
BBC_PC3	06/06/16	08/31/16	9	1.6	2.7	2.1
BBC_PC3	06/12/17	08/21/17	11	1.3	3.0	2.1
BBC_PC3	06/05/18	09/11/18	14	1.4	2.7	2.2
BBC_PC3	05/30/19	09/23/19	24	1.4	3.5	2.6
BBC_PC5	07/27/15	08/10/15	2	1.3	1.4	1.4
BBC_PC5	07/05/16	08/15/16	4	1.0	1.2	1.2
BBC_PC5	07/06/17	08/03/17	3	0.9	1.5	1.1
BBC_PC5	07/10/18	08/21/18	4	1.2	1.4	1.3
BBC_PC5	07/11/19	08/15/19	3	1.5	1.7	1.6
BBC_PC6	08/25/15	08/25/15	1	1.2	1.2	1.2
BBC_PC6	07/06/17	07/06/17	1	0.7	0.7	0.7
BBC_PC6	07/10/18	07/24/18	2	1.2	1.3	1.3

Toxics and other pollutants (metals, ammonia, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_PC1	07/13/15	08/25/15	0.2	4	0.011	0.028	0.017
BBC_PC1	07/05/16	08/15/16	0.2	4	0.005	0.012	0.007
BBC_PC1	07/06/17	08/17/17	0.2	4	0.004	0.009	0.005
BBC_PC1	07/10/18	08/21/18	0.2	4	0.006	0.018	0.009
BBC_PC1	07/11/19	08/15/19	0.2	4	0.004	0.011	0.007
BBC_PC2	07/13/15	08/25/15	0.2	4	0.009	0.014	0.012
BBC_PC2	07/13/15	08/25/15	2.1	4	0.008	0.017	0.012

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_PC2	07/05/16	08/15/16	0.5	5	0.006	0.010	0.008
BBC_PC2	07/05/16	08/15/16	2.1	3	0.004	0.014	0.009
BBC_PC2	07/06/17	08/17/17	0.2	4	0.005	0.008	0.006
BBC_PC2	07/06/17	08/17/17	2.2	4	0.004	0.007	0.006
BBC_PC2	07/10/18	08/21/18	0.2	4	0.008	0.019	0.012
BBC_PC2	07/10/18	08/21/18	2.0	4	0.008	0.018	0.011
BBC_PC2	07/11/19	08/15/19	0.2	4	0.004	0.004	0.004
BBC_PC3	07/13/15	08/25/15	0.2	4	0.006	0.017	0.011
BBC_PC3	07/05/16	08/15/16	0.2	4	0.005	0.012	0.008
BBC_PC3	07/06/17	08/17/17	0.2	4	0.004	0.009	0.005
BBC_PC3	07/10/18	08/21/18	0.2	4	0.006	0.026	0.014
BBC_PC3	07/11/19	08/15/19	0.2	4	0.004	0.009	0.005
BBC_PC5	07/13/15	08/25/15	0.2	4	0.008	0.014	0.011
BBC_PC5	07/05/16	08/15/16	0.2	4	0.004	0.010	0.007
BBC_PC5	07/06/17	08/17/17	0.2	4	0.005	0.009	0.008
BBC_PC5	07/10/18	08/21/18	0.2	4	0.006	0.015	0.011
BBC_PC5	07/11/19	08/15/19	0.2	4	0.004	0.013	0.008
BBC_PC6	07/13/15	08/25/15	0.2	4	0.006	0.010	0.009
BBC_PC6	07/05/16	08/15/16	0.2	4	0.006	0.017	0.009
BBC_PC6	07/06/17	08/17/17	0.2	4	0.006	0.012	0.008
BBC_PC6	07/10/18	08/21/18	0.2	4	0.006	0.014	0.011
BBC_PC6	07/11/19	08/15/19	0.2	4	0.004	0.006	0.005
BBC_PHM2	07/13/15	08/25/15	0.1	4	0.024	0.091	0.051
BBC_PHM2	07/05/16	08/15/16	0.2	4	0.014	0.025	0.019

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Pocasset Harbor (MA95-17); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Pocasset Harbor (MA95-17): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.3155 sq mi (95%). The approved shellfish growing area represents 0.1404 sq mi (42%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is <100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB49.0	Pocasset And Red Brook Harbor	Approved	0.14036	42.2%
BB49.3	Pocasset Harbor	Conditionally Approved	0.12138	36.5%
BB49.4	Wings Neck Creek	Prohibited	0.00220	0.7%
BB49.6	Mill Pond Mooring Area	Conditionally Approved	0.05154	15.5%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Pocasset Harbor (MA95-17) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There are two beaches in Pocasset Harbor, Bourne known as Wings Neck Trust Association (South Beach) (ID 2653) and Barlows Landing (ID 2658). These beaches were never posted for any swimming advisories between 2014 and 2019. The Primary Contact Recreational Use for Pocasset Harbor (MA95-17) is assessed as Fully Supporting since there were no swimming advisory postings at either the Wings Neck Trust Association or Barlows Landing beaches between 2014 and 2019.	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2653	Wings Neck Trust Association (South Beach)/Bourne	41.68477	-70.64350	41.68345	-70.64340	0%	0%	0%	0%	0%	0%	0
2658	Barlows Landing/Bourne	41.69181	-70.62650	41.69092	-70.62650	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Pocasset Harbor (MA95-17): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.3155 sq mi (95%). The approved shellfish growing area represents 0.1404 sq mi (42%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	

There are two beaches in Pocasset Harbor, Bourne known as Wings Neck Trust Association (South Beach) (ID 2653) and Barlows Landing (ID 2658). These beaches were never posted for any swimming advisories between 2014 and 2019. The Secondary Contact Recreational Use for Pocasset Harbor (MA95-17) is assessed as Fully Supporting since there were no swimming advisory postings at either the Wings Neck Trust Association or Barlows Landing beaches between 2014 and 2019.

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary

Pocasset Harbor (MA95-17): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.3155 sq mi (95%). The approved shellfish growing area represents 0.1404 sq mi (42%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Pocasset River (MA95-16)

Location:	From the outlet of Mill Pond, Bourne to the mouth at Buzzards Bay, Bourne.
AU Type:	ESTUARY
AU Size:	0.05 SQUARE MILES
Classification/Qualifier:	SA: ORW, SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	5	Dissolved Oxygen		Added
4a	5	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			

Recommendations

2022 Recommendations
ALU: Continue to conduct total nitrogen sampling (at least three times per season at mid-ebb tide) as well as chlorophyll a monitoring in this Pocasset River AU (MA95-16) to evaluate nutrient related stress and need for addition of impairments in future IR reporting cycles.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in the downstream half of the Pocasset River AU (MA95-16) in the summers of 2015-2019: just downstream of Shore Rd bridge (BBC_PR2), off the dock at Pocasset River Marina (BBC_PR1) and close to the downstream end of the AU (BBC_PR3). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at BBC_PR1 and PR3 (depths ranged from 2.1-2.4m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 28°C (n=418). The minimum dissolved oxygen (DO) was 1.5mg/L (n=434): <6.0mg/L 219 times (~50% of the measurements overall) and <5.0mg/L 93 times (21% of the measurements overall) between 2015-2019. Excursions from the DO criterion occurred at a similar frequency in both surface waters and at depth throughout the sample area. Total nitrogen sampling at BBC_PR2 and PR3 (n=36) during ebb tides in July-August documented seasonal average total nitrogen concentrations between 0.32-0.55mg/L; >0.5mg/L (the MEP critical indicator threshold for waters where eelgrass has not been documented) twice (once at PR2 in 2018 and once at PR3 in 2019). The maximum chlorophyll *a* concentration was 9.27µg/L (n=36), twice >5µg/L (once at PR2 in 2108 and once at PR3 in 2015). Secchi disk depths ranged from 1.5 to 3.1m (n=138). Ammonia-nitrogen concentrations were generally low, (range 0.004 to 0.09mg/L (n=36)), but TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for Pocasset River (MA95-16) is assessed as Not Supporting based on the frequency of low DO documented by BBC staff/volunteers between 2015 and 2019. An impairment for Dissolved Oxygen is being added in agreement with the BBC comments made on the 2018/20 IR. While BBC also requested that the Pocasset River be impaired for Total Nitrogen (based on concentrations frequently above 0.4mg/L with a maximum of 0.9mg/L at PR3 in 2010) and incidences of elevated algal pigments (chlorophyll *a* + phaeophytin ≥10µg/L at PR2 and PR3 in 2006 and 2012), MassDEP review of BBC's 2015 to 2019 data documented only two incidences of a seasonal average total nitrogen concentration >0.5mg/L (the MEP critical indicator threshold used for this AU) and there were no incidences of chlorophyll *a* concentrations being >10µg/L (guidance threshold for use attainment decisions described in the CALM), therefore Total Nitrogen and Chlorophyll *a* impairments are not being added at this time. However, Alerts for both total nitrogen and chlorophyll *a* are being identified and continued monitoring for them is being recommended.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_PR1	Buzzards Bay Coalition	Water Quality	Pocasset River	Pocasset River, Bourne	41.695673	-70.619648
BBC_PR2	Buzzards Bay Coalition	Water Quality	Pocasset River	Pocasset River, Bourne	41.695618	-70.618896
BBC_PR3	Buzzards Bay Coalition	Water Quality	Pocasset River	Pocasset River, Bourne	41.698505	-70.623119

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_PR1	05/28/15	09/24/15	0.2	18	3.5	6.5	28	11	11
BBC_PR1	05/28/15	09/24/15	2.4	18	4.5	6.6	28	6	0
BBC_PR1	06/01/16	09/21/16	0.2	20	3.7	6.2	40	15	5
BBC_PR1	06/01/16	09/21/16	2.4	21	3.1	6.2	33	5	5
BBC_PR1	06/01/17	09/16/17	0.2	21	4.8	6.8	24	5	0
BBC_PR1	06/01/17	09/16/17	2.4	21	5.0	6.4	24	0	0
BBC_PR1	06/11/18	09/19/18	0.2	20	3.0	6.7	25	5	5
BBC_PR1	06/16/18	09/19/18	2.4	19	4.0	6.2	37	11	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_PR1	06/10/19	09/23/19	0.2	20	4.5	5.9	40	15	0
BBC_PR1	06/10/19	09/23/19	2.3	21	2.5	5.4	43	29	14
BBC_PR3	05/28/15	09/22/15	0.2	23	2.5	4.8	87	43	17
BBC_PR3	05/28/15	09/22/15	2.1	24	1.5	4.6	75	54	33
BBC_PR3	06/01/16	09/21/16	0.2	25	2.0	4.7	88	48	16
BBC_PR3	06/01/16	09/21/16	2.1	27	2.5	4.9	78	41	15
BBC_PR3	05/31/17	09/19/17	0.2	27	4.5	5.9	41	7	0
BBC_PR3	05/31/17	09/19/17	2.2	27	3.5	6.0	41	4	4
BBC_PR3	06/01/18	09/18/18	0.2	19	3.5	5.5	47	26	5
BBC_PR3	06/01/18	09/18/18	2.1	22	4.0	5.5	59	18	0
BBC_PR3	05/29/19	09/23/19	0.2	20	3.5	5.3	55	45	5
BBC_PR3	05/29/19	09/23/19	2.2	21	3.5	5.1	81	29	5

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_PR1	05/28/15	09/24/15	0.2	18	15	24.0	20.3	0
BBC_PR1	05/28/15	09/24/15	2.4	18	15	24.0	20.5	0
BBC_PR1	06/01/16	09/21/16	0.2	20	18	25.7	21.6	0
BBC_PR1	06/01/16	09/21/16	2.4	20	18	25.1	20.5	0
BBC_PR1	06/01/17	09/16/17	0.2	21	20	24.5	20.8	0
BBC_PR1	06/01/17	09/16/17	2.4	21	20	23.1	20.2	0
BBC_PR1	06/11/18	09/19/18	0.2	20	19	23.3	20.5	0
BBC_PR1	06/16/18	09/19/18	2.4	19	18	23.3	20.9	0
BBC_PR1	06/10/19	09/23/19	0.2	20	18	24.0	20.4	0
BBC_PR1	06/10/19	09/23/19	2.4	20	18	24.0	20.9	0
BBC_PR2	07/13/15	08/25/15	0.2	4	4	23.0	21.3	0
BBC_PR2	07/05/16	08/15/16	0.2	3	3	25.0	23.0	0
BBC_PR2	07/06/17	08/17/17	0.2	4	4	24.6	22.5	0
BBC_PR2	07/10/18	08/21/18	0.2	4	4	24.7	23.0	0
BBC_PR2	07/25/19	08/15/19	0.2	3	3	24.3	23.1	0
BBC_PR3	05/28/15	09/22/15	0.2	27	24	25.0	22.4	0
BBC_PR3	05/28/15	09/22/15	2.2	23	20	26.0	22.3	0
BBC_PR3	06/01/16	09/21/16	0.2	28	24	26.0	21.8	0
BBC_PR3	06/01/16	09/21/16	2.1	25	21	26.0	21.5	0
BBC_PR3	05/31/17	09/19/17	0.2	31	28	25.0	21.2	0
BBC_PR3	05/31/17	09/19/17	2.2	26	23	25.0	20.9	0
BBC_PR3	06/01/18	09/18/18	0.2	24	23	28.0	21.9	0
BBC_PR3	06/01/18	09/18/18	2.1	22	21	28.0	22.1	0
BBC_PR3	05/29/19	09/23/19	0.2	23	20	25.0	20.8	0
BBC_PR3	05/29/19	09/23/19	2.2	20	17	26.0	20.5	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_PR2	2015	0.2	4	0.32	0.54	0.44	4	2.84	4.46	3.33	4	0
BBC_PR2	2016	0.2	3	0.38	0.51	0.45	3	1.80	2.30	1.99	3	0
BBC_PR2	2017	0.2	4	0.36	0.69	0.50	4	2.30	4.54	3.18	4	0
BBC_PR2	2018	0.2	4	0.45	0.60	0.52	4	2.62	9.27	4.41	3	0
BBC_PR2	2019	0.2	3	0.42	0.57	0.48	3	1.44	3.61	2.68	3	0
BBC_PR3	2015	0.2	4	0.27	0.40	0.32	4	2.57	5.94	4.05	3	0
BBC_PR3	2016	0.2	3	0.34	0.34	0.34	3	2.13	2.69	2.42	3	0
BBC_PR3	2017	0.2	4	0.32	0.64	0.50	4	2.51	4.58	3.39	4	0
BBC_PR3	2018	0.2	4	0.38	0.47	0.41	4	2.34	3.13	2.63	4	0
BBC_PR3	2019	0.2	3	0.40	0.64	0.55	3	1.42	3.77	2.43	3	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_PR1	05/28/15	09/24/15	15	1.5	2.5	2.1
BBC_PR1	06/01/16	09/21/16	20	1.5	2.6	2.0
BBC_PR1	06/01/17	09/06/17	19	1.7	2.4	2.0
BBC_PR1	06/11/18	09/19/18	20	1.7	2.6	2.1
BBC_PR1	06/15/19	09/23/19	19	1.8	3.1	2.2
BBC_PR2	07/27/15	08/25/15	2	1.7	1.8	1.7
BBC_PR2	07/05/16	07/05/16	1	1.9	1.9	1.9
BBC_PR3	06/16/15	08/28/15	9	1.9	2.8	2.3
BBC_PR3	06/03/16	08/30/16	6	1.8	2.5	2.1
BBC_PR3	06/05/17	09/19/17	14	1.6	2.8	2.1
BBC_PR3	06/01/18	09/10/18	12	1.8	2.7	2.2
BBC_PR3	08/08/19	08/08/19	1	1.7	1.7	1.7

Public comment submitted by Buzzards Bay Coalition as part of the 2018/20 IR

F. Pocasset River Fails to Meet State Water Quality Standards and Must be Listed on the 2018/2020 List of Category 5 Waters for Total Nitrogen.

The Coalition requests that the Pocasset River be listed as impaired for total nitrogen. The Coalition's water quality monitoring data support its listing.

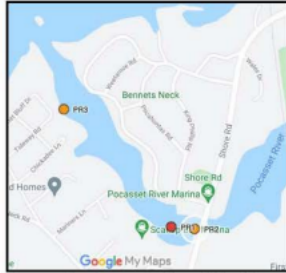


Figure 21. Pocasset River Site Map

Pocasset River demonstrates water quality decline related to excess nutrients. As described above, excessive levels of nitrogen are common in southeastern Massachusetts and result in ecosystem degradation with impacts including loss of eelgrass beds, algae blooms, fish kills and

reductions in important marine life. In order to target areas suffering from excessive levels of nitrogen, like the Pocasset River, and remove as much nitrogen as possible from these areas, it is imperative that MassDEP list Pocasset River as impaired for total nitrogen, requiring a TMDL for nitrogen.

7. Pocasset River Dissolved Oxygen

The Coalition submits oxygen data from multiple years from stations PR1 and PR3 depicting water quality impairment due to nutrient over-enrichment. The Coalition's dissolved oxygen data show that Pocasset River consistently falls below the numeric criteria of 6 mg/L as designated in 314 CMR 4.05(4)(a)(1)(a) and warrants listing on the 303(d) list.

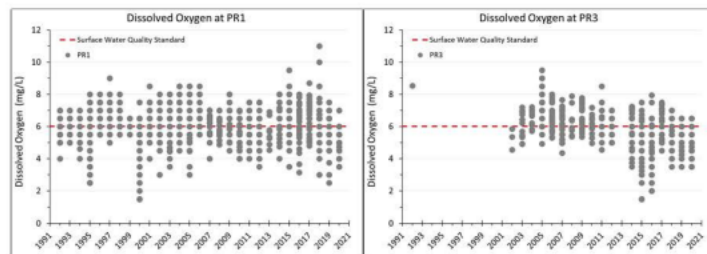


Figure 22. Dissolved Oxygen Concentrations in the Pocasset River

The dissolved oxygen concentrations in Figure 18 clearly show many samples below the numeric dissolved oxygen criteria established in the Massachusetts Surface Water Quality Standards.

8. Chlorophyll Data

The Coalition's chlorophyll data show that the Pocasset River does not always possess the excellent aesthetic values required of SA waters pursuant to 314 CMR 4.05(4)(a), "These waters shall have excellent aesthetic value" and warrants listing on the 303(d) list.

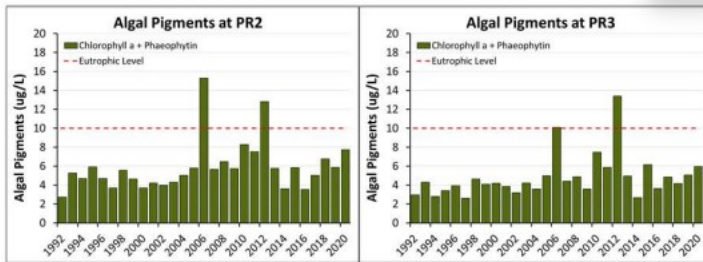


Figure 23. Phytoplankton Pigments in the Pocasset River

The data presented in Figure 23 show levels of algal pigments at sampling stations PR2 and PR3 that are periodically greater than 10 mg/L. High concentrations of chlorophyll indicate degraded water clarity in violation of the excellent aesthetic value required in Massachusetts Surface Water Quality Standards.

9. Pocasset River Total Nitrogen Data

The Coalition's total nitrogen data for Pocasset River suggests that the nitrogen levels are leading to the low dissolved oxygen numbers and promoting the algae growth depicted above.

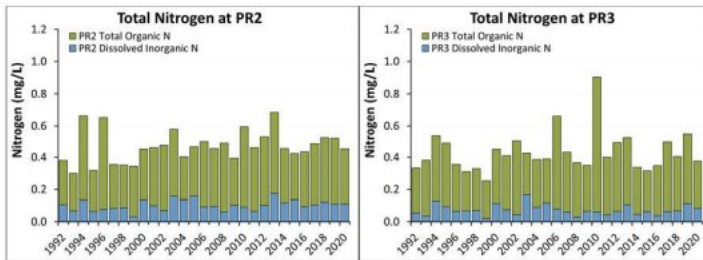


Figure 24. Total Nitrogen in Pocasset River

Figure 24 exhibits total nitrogen concentrations in the Pocasset River, frequently above 0.4 mg/L at both stations and reaching as high as 0.9 mg/L in one year at station PR3. In addition, the proportion of total nitrogen as inorganic nitrogen is relatively high at both stations. The incidences of high total nitrogen concentration and high chlorophyll indicate that the Pocasset River fails to attain state water quality standards and must be listed on the 303d list as impaired for total nitrogen.

The combined data above demonstrate that the Pocasset River is suffering from eutrophication due to excess nutrients and must be listed on the Commonwealth of Massachusetts' 303(d) list of Category 5 waters requiring a TMDL for total nitrogen. Dissolved oxygen data at sampling sites PR1 and PR3 are in clear violation of surface water quality standards, falling below dissolved oxygen levels of 6 mg/L. Sampling sites PR2 and PR3 also have high total nitrogen concentrations.

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_PR2	07/13/15	08/25/15	0.2	4	0.023	0.079	0.046
BBC_PR2	07/05/16	08/15/16	0.2	3	0.019	0.055	0.040
BBC_PR2	07/06/17	08/17/17	0.2	4	0.031	0.043	0.037
BBC_PR2	07/10/18	08/21/18	0.2	4	0.018	0.060	0.042
BBC_PR2	07/25/19	08/15/19	0.2	3	0.025	0.067	0.047
BBC_PR3	07/13/15	08/25/15	0.2	4	0.014	0.054	0.029
BBC_PR3	07/05/16	08/15/16	0.2	3	0.011	0.038	0.021
BBC_PR3	07/06/17	08/17/17	0.2	4	0.025	0.028	0.026
BBC_PR3	07/10/18	08/21/18	0.2	4	0.004	0.047	0.026
BBC_PR3	07/25/19	08/15/19	0.2	3	0.032	0.088	0.052

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Pocasset River (MA95-16); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
Pocasset River (MA95-16): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0365 sq mi (69%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0363 sq mi (69%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB46.2	Little Bay	Conditionally Approved	0.00017	0.3%
BB48.0	Pocasset River	Prohibited	0.03630	68.9%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Pocasset River (MA95-16) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There is one beach in Pocasset River, Bourne known as Tahanto Associates (ID 2651). This beach was never posted for any swimming advisories between 2014 and 2019. The Primary Contact Recreational Use for Pocasset River (MA95-16) is assessed as Fully Supporting since there were no swimming advisory postings at the Tahanto Associates Beach between 2014 and 2019.	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2651	Tahanto Associates, Inc./Bourne	41.69918	-70.62260	41.70009	-70.62190	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Pocasset River (MA95-16): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0365 sq mi (69%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There is one beach in Pocasset River, Bourne known as Tahanto Associates (ID 2651). This beach was never posted for any swimming advisories between 2014 and 2019. The Secondary Contact Recreational Use for Pocasset River (MA95-16) is assessed as Fully Supporting, since there were no swimming advisory postings at the Tahanto Associates Beach between 2014 and 2019.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Pocasset River (MA95-16): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0365 sq mi (69%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Queen Sewell Pond (MA95180)

Location:	Bourne (formerly reported as 2000 segment: Queen Sewell Pond MA96253).
AU Type:	FRESHWATER LAKE
AU Size:	18 ACRES
Classification/Qualifier:	B

No usable data were available for Queen Sewell Pond (MA95180) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Harmful Algal Blooms		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Harmful Algal Blooms	Source Unknown (N)			X	X	X

Quissett Harbor (MA95-25)

Location:	The semi-enclosed body of water landward of a line drawn between The Knob and Gansett Point, Falmouth.
AU Type:	ESTUARY
AU Size:	0.17 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	4a	Estuarine Bioassessments	R1_MA_2018_03	Changed
5	4a	Fecal Coliform	36172	Unchanged
5	4a	Nitrogen, Total	R1_MA_2018_03	Changed
5	4a	Nutrient/Eutrophication Biological Indicators	R1_MA_2018_03	Changed

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Golf Courses (Y)	X					
Estuarine Bioassessments	Impervious Surface/Parking Lot Runoff (Y)	X					
Estuarine Bioassessments	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Estuarine Bioassessments	Residential Districts (Y)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Golf Courses (Y)	X					
Nitrogen, Total	Impervious Surface/Parking Lot Runoff (Y)	X					
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nitrogen, Total	Residential Districts (Y)	X					
Nutrient/Eutrophication Biological Indicators	Golf Courses (Y)	X					
Nutrient/Eutrophication Biological Indicators	Impervious Surface/Parking Lot Runoff (Y)	X					
Nutrient/Eutrophication Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nutrient/Eutrophication Biological Indicators	Residential Districts (Y)	X					

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Estuarine Bioassessments	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Quissett Harbor Embayment System Total Maximum Daily Loads for Nitrogen (Total) (Report CN 374.1, approved 2018-02-13, ATTAINS Action ID: R1_MA_2018_03)
Nitrogen, Total	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Quissett Harbor Embayment System Total Maximum Daily Loads for Nitrogen (Total) (Report CN 374.1, approved 2018-02-13, ATTAINS Action ID: R1_MA_2018_03)
Nutrient/Eutrophication Biological Indicators	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Quissett Harbor Embayment System Total Maximum Daily Loads for Nitrogen (Total) (Report CN 374.1, approved 2018-02-13, ATTAINS Action ID: R1_MA_2018_03)

Recommendations

2022 Recommendations
ALU: Continue to monitor eelgrass bed habitat and water quality (DO, total nitrogen, and chlorophyll <i>a</i>) in Quissett Harbor (MA95-25). Evaluate potential for delisting impairments if conditions continue to improve.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>The MassDEP Eelgrass Mapping Project documented an ~11% loss of eelgrass bed habitat in Quissett Harbor between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in Quissett Harbor, Falmouth (MA95-25) in the summers of 2015-2019 as follows: at the eastern end (known as the “inner harbor”) from a dock at Quissett Harbor boatyard (BBC_QH2), from a dock on the east shore about half way down the AU (BBC_QH1), and at the western end of the harbor (close to the Woods Hole Golf Club) (BBC_QH3). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column (at depths ranging 0.5-2.8m) and was usually conducted weekly (between the hours of 6 and 9am): The maximum temperature was 27.4°C (n=297). The minimum dissolved oxygen (DO) was 2.0mg/L (n=321): <6.0mg/L 68 times (~21% of the measurements overall) and <5.0mg/L 24 times (~8% of the measurements overall). Excursions from the DO criterion (6.0mg/L) were more common at the two ends of the harbor (i.e., BBC_QH2 and QH3), with measurements <5mg/L most frequently documented at both the surface and depth in 2015. Total nitrogen sampling (n=38, maximum 0.54mg/L) during ebb tides typically in May-September documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.28-0.34mg/L. The maximum Chlorophyll <i>a</i> was 8.66µg/L (n=101), twice >5µg/L. Secchi disk depths throughout the AU (most at BBC_QH2) ranged from 0.6 to 3.8m (n=96), with yearly averages ranging from 2 to 2.7m. Ammonia-nitrogen concentrations were low (range 0.004 to 0.078mg/L (n=101)), but TUs could not be calculated (lack of quality assured pH and salinity data).</p> <p>The Aquatic Life Use for Quissett Harbor (MA95-25) will continue to be assessed as Not Supporting with the Estuarine Bioassessments, Total Nitrogen, and Nutrient/Eutrophication Biological Indicators impairments all being carried forward. Eelgrass bed habitat loss documented by MassDEP between 1995 and 2017 is ~11% although improving conditions have recently been documented. Water quality data collected by BBC staff/volunteers in 2015-2019 except for slightly low DO were also generally indicative of good conditions. Continued monitoring will be recommended and if eelgrass bed habitat continues to improve delisting may be considered in a future IR reporting cycle.</p>	

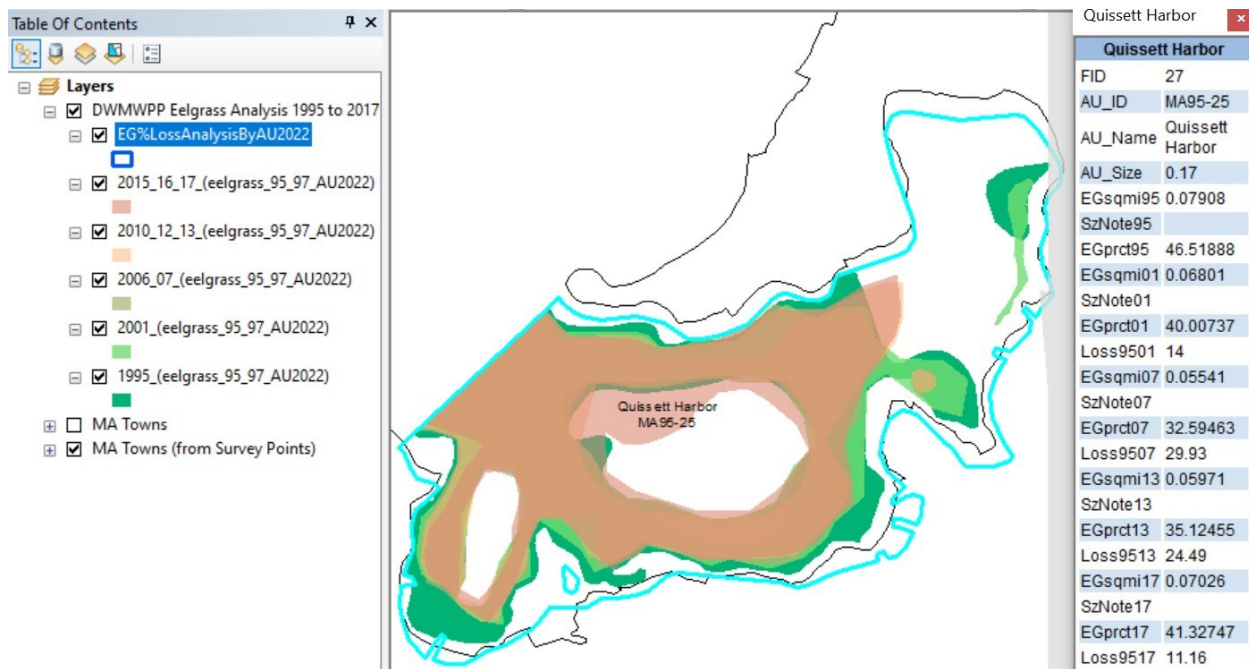
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_QH1	Buzzards Bay Coalition	Water Quality	Quissett Harbor	Quissett Harbor Outer, Falmouth	41.538651	-70.656724
BBC_QH2	Buzzards Bay Coalition	Water Quality	Quissett Harbor	Quissett Harbor Inner, Falmouth	41.543981	-70.652772
BBC_QH3	Buzzards Bay Coalition	Water Quality	Quissett Harbor	Quissett Harbor Golf Course, Falmouth	41.53753	-70.663978

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Quissett Harbor MA95-25 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~11% loss of eelgrass bed habitat in Quissett Harbor between 1995 and 2017

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_QH1	06/29/15	12/09/15	0.2	10	5.4	7.5	20	0	0
BBC_QH1	01/06/16	09/26/16	0.2	12	6.5	8.8	0	0	0
BBC_QH1	03/08/17	09/19/17	0.2	9	5.6	8.0	11	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_QH1	06/16/18	09/05/18	0.2	12	5.5	6.6	17	0	0
BBC_QH1	06/16/18	09/11/18	1.4	11	5.5	6.6	9	0	0
BBC_QH2	06/29/15	12/09/15	0.2	17	3.8	6.3	35	24	6
BBC_QH2	08/19/15	09/22/15	2.2	7	4.0	6.9	29	14	0
BBC_QH2	01/06/16	09/26/16	0.2	13	5.5	7.7	15	0	0
BBC_QH2	07/29/16	07/29/16	0.5	1	5.0	5.0	100	0	0
BBC_QH2	01/09/17	09/19/17	0.2	14	4.8	7.4	21	7	0
BBC_QH2	08/17/17	09/16/17	2.6	3	5.5	6.3	33	0	0
BBC_QH2	06/20/18	08/21/18	0.2	12	4.7	6.9	17	8	0
BBC_QH2	06/20/18	08/19/18	2.6	12	6.0	7.6	0	0	0
BBC_QH2	06/11/19	09/10/19	0.2	14	6.5	7.7	0	0	0
BBC_QH2	06/11/19	09/10/19	2.8	15	6.0	7.3	0	0	0
BBC_QH3	05/29/15	08/25/15	0.2	18	3.0	6.0	56	22	11
BBC_QH3	05/29/15	08/19/15	2.4	15	2.0	4.9	73	47	27
BBC_QH3	07/04/16	09/08/16	0.2	12	4.0	7.3	8	8	0
BBC_QH3	07/06/17	09/21/17	0.2	15	4.0	6.6	20	13	0
BBC_QH3	07/28/17	09/21/17	2.2	12	4.5	6.3	17	8	0
BBC_QH3	05/30/18	09/19/18	0.2	24	5.0	6.3	33	0	0
BBC_QH3	05/30/18	09/19/18	2.4	21	5.0	6.3	38	0	0
BBC_QH3	05/30/19	09/23/19	0.2	21	6.0	7.8	0	0	0
BBC_QH3	05/30/19	09/23/19	2.4	21	5.5	7.5	5	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_QH1	06/16/15	12/09/15	0.2	11	7	24.9	22.7	0
BBC_QH1	01/06/16	09/26/16	0.2	12	7	27.4	22.8	0
BBC_QH1	03/08/17	09/19/17	0.2	9	7	26.1	21.4	0
BBC_QH1	06/16/18	09/05/18	0.2	12	12	26.0	22.7	0
BBC_QH1	06/16/18	09/11/18	1.4	11	11	25.5	22.1	0
BBC_QH1	07/11/19	08/15/19	0.2	4	4	24.0	23.1	0
BBC_QH2	06/16/15	12/09/15	0.2	18	12	26.0	23.6	0
BBC_QH2	08/19/15	09/22/15	2.2	7	5	25.0	24.6	0
BBC_QH2	01/06/16	09/26/16	0.2	13	8	27.4	23.3	0
BBC_QH2	07/29/16	07/29/16	0.5	1	1	26.6	26.6	0
BBC_QH2	01/09/17	09/19/17	0.2	14	10	26.0	21.9	0
BBC_QH2	08/17/17	09/16/17	2.8	3	2	22.1	21.2	0
BBC_QH2	06/20/18	08/21/18	0.2	14	14	27.0	24.1	0
BBC_QH2	06/20/18	08/19/18	2.6	11	11	27.0	23.1	0
BBC_QH2	06/11/19	09/10/19	0.2	20	20	25.0	22.0	0
BBC_QH2	06/11/19	09/10/19	2.7	15	15	25.0	20.8	0
BBC_QH3	05/29/15	08/25/15	0.2	18	17	26.0	22.3	0
BBC_QH3	05/29/15	08/19/15	2.3	14	13	25.0	21.8	0
BBC_QH3	07/04/16	09/08/16	0.2	13	13	26.6	23.8	0
BBC_QH3	07/06/17	09/21/17	0.2	16	15	25.2	21.8	0
BBC_QH3	07/28/17	09/21/17	2.2	12	11	22.6	21.1	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_QH3	05/30/18	09/19/18	0.2	25	23	26.0	21.1	0
BBC_QH3	05/30/18	09/19/18	2.3	21	19	25.0	20.5	0
BBC_QH3	05/30/19	09/23/19	0.2	25	22	26.0	21.6	0
BBC_QH3	05/30/19	09/23/19	2.4	21	18	25.0	21.3	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_QH1	2015	0.2	4	0.17	0.51	0.30	11	0.86	3.95	2.32	11	0
BBC_QH1	2016	0.2	3	0.21	0.47	0.31	12	0.54	8.66	1.89	11	0
BBC_QH1	2017	0.2	--	--	--	--	9	1.17	2.64	1.77	9	0
BBC_QH1	2018	0.2	1	0.30	0.30	0.30	4	1.12	4.55	2.27	4	0
BBC_QH1	2019	0.2	--	--	--	--	4	1.47	4.58	3.01	4	0
BBC_QH2	2015	0.2	8	0.22	0.47	0.34	11	1.20	6.89	3.10	10	0
BBC_QH2	2016	0.2	5	0.27	0.34	0.31	12	0.58	4.14	1.78	12	0
BBC_QH2	2017	0.2	7	0.26	0.54	0.34	10	1.04	2.28	1.86	10	0
BBC_QH2	2018	0.2	4	0.31	0.38	0.34	4	2.09	4.66	2.90	4	0
BBC_QH2	2019	0.2	3	0.24	0.31	0.28	4	1.97	3.45	2.84	4	0
BBC_QH3	2015	0.2	2	0.16	0.20	0.18	4	1.35	3.56	2.34	4	0
BBC_QH3	2016	0.2	--	--	--	--	4	0.53	1.41	1.03	4	0
BBC_QH3	2017	0.2	1	0.20	0.20	0.20	4	1.23	2.14	1.76	4	0
BBC_QH3	2018	0.2	--	--	--	--	4	1.37	3.52	2.49	4	0
BBC_QH3	2019	0.2	--	--	--	--	4	1.39	4.05	2.37	4	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_QH1	06/16/18	06/16/18	1	2.3	2.3	2.3
BBC_QH2	06/16/15	10/09/15	14	1.9	3.8	2.7
BBC_QH2	01/06/16	09/26/16	11	0.6	3.3	2.6
BBC_QH2	01/09/17	09/19/17	11	1.8	3.4	2.5
BBC_QH2	06/20/18	08/21/18	13	1.7	3.5	2.7
BBC_QH2	06/11/19	09/10/19	18	1.7	3.3	2.5
BBC_QH3	05/29/15	07/30/15	7	1.2	3.0	2.2
BBC_QH3	09/06/17	09/21/17	2	1.1	2.9	2.0
BBC_QH3	05/30/18	08/20/18	6	1.6	3.7	2.6
BBC_QH3	05/30/19	09/13/19	13	1.0	3.2	2.2

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_QH1	06/16/15	12/09/15	0.2	11	0.005	0.024	0.011
BBC_QH1	01/06/16	09/26/16	0.2	12	0.004	0.012	0.007
BBC_QH1	03/08/17	09/19/17	0.2	9	0.004	0.009	0.006
BBC_QH1	07/10/18	08/21/18	0.2	4	0.004	0.007	0.006
BBC_QH1	07/11/19	08/15/19	0.2	4	0.004	0.004	0.004
BBC_QH2	06/16/15	12/09/15	0.2	11	0.014	0.078	0.033
BBC_QH2	01/06/16	09/26/16	0.2	12	0.004	0.029	0.012
BBC_QH2	01/09/17	09/19/17	0.2	10	0.006	0.043	0.021
BBC_QH2	07/10/18	08/21/18	0.2	4	0.006	0.022	0.013
BBC_QH2	07/11/19	08/15/19	0.2	4	0.004	0.012	0.007
BBC_QH3	07/13/15	08/25/15	0.2	4	0.006	0.019	0.012
BBC_QH3	07/05/16	08/15/16	0.2	4	0.006	0.017	0.009
BBC_QH3	07/06/17	08/17/17	0.2	4	0.004	0.006	0.005
BBC_QH3	07/10/18	08/21/18	0.2	4	0.004	0.005	0.004
BBC_QH3	07/11/19	08/15/19	0.2	4	0.004	0.005	0.004

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Quissett Harbor (MA95-25); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Quissett Harbor (MA95-25): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1613 sq mi (95%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB58.2	Quisset Harbor Mooring Area	Conditionally Approved	0.16127	94.8%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Quissett Harbor (MA95-25) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Quissett Harbor (MA95-25) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Quissett Harbor (MA95-25): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1613 sq mi (95%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Quissett Harbor (MA95-25) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Quissett Harbor (MA95-25): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1613 sq mi (95%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Rands Harbor (MA95-78)

Location:	harbor south off Megansett Harbor, Falmouth.
AU Type:	ESTUARY
AU Size:	0.02 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Estuarine Bioassessments	R1_EPA_MA_01	Changed
5	5	Fecal Coliform		Unchanged
5	5	Nitrogen, Total	R1_EPA_MA_01	Changed
5	5	Nutrient/Eutrophication Biological Indicators	R1_EPA_MA_01	Changed

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Golf Courses (Y)	X					
Estuarine Bioassessments	Impervious Surface/Parking Lot Runoff (Y)	X					
Estuarine Bioassessments	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Estuarine Bioassessments	Residential Districts (Y)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Golf Courses (Y)	X					
Nitrogen, Total	Impervious Surface/Parking Lot Runoff (Y)	X					
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nitrogen, Total	Residential Districts (Y)	X					
Nutrient/Eutrophication Biological Indicators	Golf Courses (Y)	X					
Nutrient/Eutrophication Biological Indicators	Impervious Surface/Parking Lot Runoff (Y)	X					
Nutrient/Eutrophication Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nutrient/Eutrophication Biological Indicators	Residential Districts (Y)	X					

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Nitrogen, Total	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Fiddlers Cove and Rands Harbor Embayment Systems for Nitrogen (Total) (Report CN 394.1, approved 2018-02-13, ATTAINS Action ID: R1_EPA_MA_01)
Nutrient/Eutrophication Biological Indicators	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Fiddlers Cove and Rands Harbor Embayment Systems for Nitrogen (Total) (Report CN 394.1, approved 2018-02-13, ATTAINS Action ID: R1_EPA_MA_01)
Estuarine Bioassessments	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Fiddlers Cove and Rands Harbor Embayment Systems for Nitrogen (Total) (Report CN 394.1, approved 2018-02-13, ATTAINS Action ID: R1_EPA_MA_01)

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in Rands Harbor, Falmouth (MA95-78) in the summers of 2015-2019 as follows: at the inside end of the northern arm of the harbor (BBC_RH3), at the inside end of the southern arm of the harbor (BBC_RH1), and at the outer end of the southern arm of the harbor (BBC_RH1A). Monitoring was usually limited to the surface waters at all locations and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 27°C (n=43). The minimum dissolved oxygen (DO)(data from only BBC_RH1 and RH3) was 4.3mg/L (n=28), <6.0mg/L 16 times (~57% of the measurements overall), and <5.0mg/L five times (~18% of the measurements overall). The excursions from the criterion (6.0mg/L) occurred at both inner harbor locations, though the severe excursions (<5mg/L) were more frequently documented in the northern arm (BBC_RH3). Total nitrogen sampling during ebb tides in July and August (n=33, maximum 1.14mg/L) documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.33-0.72mg/L (>0.5mg/L 4/7 times). The Chlorophyll <i>a</i> maximum was 31.45µg/L (n=43), on 15 occasions >5µg/L and measured >10µg/L 6 times (14%). Secchi disk depths in 2016, 2017, and 2019 ranged from 1.0-2.1m (n=3). Ammonia-nitrogen concentrations were low (range 0.004 to 0.065mg/L (n=43)), but TUs could not be calculated (lack of quality assured pH and salinity data).</p> <p>The Aquatic Life Use for Rands Harbor (MA95-78) will continue to be assessed as Not Supporting based on data collected throughout the AU by BBC staff/volunteers in the summers of 2015-2019. The Estuarine Bioassessments, Total Nitrogen, and Nutrient Eutrophication Biological Indicators impairments are all being carried forward.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_RH1	Buzzards Bay Coalition	Water Quality	Rands Harbor	Rands Harbor, Falmouth	41.646261	-70.629431
BBC_RH1A	Buzzards Bay Coalition	Water Quality	Rands Harbor	Rands Harbor, Falmouth	41.64962	-70.629872
BBC_RH3	Buzzards Bay Coalition	Water Quality	Rands Harbor	Rands Harbor, Falmouth	41.648563	-70.627058

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_RH1	07/05/16	08/15/16	0.2	4	5.5	6.1	25	0	0
BBC_RH1	07/29/16	07/29/16	1.2	1	5.7	5.7	100	0	0
BBC_RH1	07/06/17	08/17/17	0.2	4	5.7	6.1	50	0	0
BBC_RH1	07/10/18	08/21/18	0.2	3	6.0	6.2	0	0	0
BBC_RH1	07/11/19	08/15/19	0.2	4	4.9	6.1	50	25	0
BBC_RH3	08/01/16	08/15/16	0.2	2	5.4	5.9	50	0	0
BBC_RH3	07/06/17	08/17/17	0.2	4	4.3	5.8	50	25	0
BBC_RH3	07/10/18	08/21/18	0.2	3	4.5	5.0	100	67	0
BBC_RH3	07/25/19	08/15/19	0.2	3	4.5	5.2	100	33	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_RH1	07/27/15	08/10/15	0.2	2	2	24.5	24.0	0
BBC_RH1	07/05/16	08/15/16	0.2	5	5	27.0	26.0	0
BBC_RH1	07/29/16	07/29/16	1.2	1	1	27.0	27.0	0
BBC_RH1	07/06/17	08/17/17	0.2	4	4	25.2	24.2	0
BBC_RH1	07/10/18	08/21/18	0.2	4	4	26.6	24.4	0
BBC_RH1	07/11/19	08/15/19	0.2	4	4	25.4	23.9	0
BBC_RH1A	07/18/16	08/01/16	0.2	2	2	27.0	27.0	0
BBC_RH1A	08/17/17	08/17/17	0.2	1	1	23.4	23.4	0
BBC_RH1A	07/10/18	08/21/18	0.2	3	3	24.0	22.6	0
BBC_RH1A	07/25/19	08/15/19	0.2	3	3	25.0	24.7	0
BBC_RH3	08/01/16	08/15/16	0.2	2	2	25.1	24.0	0
BBC_RH3	07/06/17	08/17/17	0.2	4	4	23.4	23.1	0
BBC_RH3	07/10/18	08/21/18	0.2	4	4	25.7	23.3	0
BBC_RH3	07/11/19	08/15/19	0.2	4	4	23.9	22.5	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_RH1	2015	0.2	2	0.25	0.39	0.32	2	3.64	8.27	5.96	1	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_RH1	2016	0.2	4	0.42	0.54	0.50	4	1.85	8.59	5.02	2	0
BBC_RH1	2017	0.2	3	0.37	0.58	0.45	4	2.33	31.45	10.92	2	1
BBC_RH1	2018	0.2	4	0.21	1.07	0.55	4	3.91	26.60	10.00	3	1
BBC_RH1	2019	0.2	2	0.64	0.68	0.66	4	1.84	7.62	4.72	3	0
BBC_RH1A	2016	0.2	--	--	--	--	2	1.54	4.48	3.01	2	0
BBC_RH1A	2017	0.2	--	--	--	--	2	3.19	3.60	3.40	2	0
BBC_RH1A	2018	0.2	3	0.28	0.39	0.33	4	1.94	6.22	3.75	3	0
BBC_RH1A	2019	0.2	2	0.44	0.50	0.47	3	1.28	4.73	3.18	3	0
BBC_RH3	2016	0.2	2	0.56	0.60	0.58	2	1.15	5.07	3.11	1	0
BBC_RH3	2017	0.2	3	0.63	0.88	0.72	4	1.85	16.99	10.02	2	2
BBC_RH3	2018	0.2	4	0.45	1.14	0.69	4	2.22	22.95	9.82	1	1
BBC_RH3	2019	0.2	4	0.60	0.65	0.63	4	0.24	18.41	5.92	3	1

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_RH1	08/03/17	08/03/17	1	1.0	1.0	1.0
BBC_RH3	08/15/16	08/15/16	1	2.1	2.1	2.1
BBC_RH3	07/11/19	07/11/19	1	1.5	1.5	1.5

Toxics and other pollutants (metals, ammonia, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_RH1	07/27/15	08/10/15	0.2	2	0.009	0.029	0.019
BBC_RH1	07/05/16	08/15/16	0.2	4	0.011	0.065	0.032
BBC_RH1	07/06/17	08/17/17	0.2	4	0.006	0.024	0.015
BBC_RH1	07/10/18	08/21/18	0.2	4	0.006	0.025	0.016
BBC_RH1	07/11/19	08/15/19	0.2	4	0.004	0.023	0.013
BBC_RH1A	07/18/16	08/01/16	0.2	2	0.004	0.005	0.005
BBC_RH1A	08/03/17	08/17/17	0.2	2	0.004	0.005	0.004
BBC_RH1A	07/10/18	08/21/18	0.2	4	0.004	0.024	0.010
BBC_RH1A	07/25/19	08/15/19	0.2	3	0.004	0.011	0.007
BBC_RH3	08/01/16	08/15/16	0.2	2	0.040	0.062	0.051
BBC_RH3	07/06/17	08/17/17	0.2	4	0.004	0.024	0.015
BBC_RH3	07/10/18	08/21/18	0.2	4	0.010	0.031	0.021
BBC_RH3	07/11/19	08/15/19	0.2	4	0.011	0.022	0.015

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Rands Harbor (MA95-78); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Rands Harbor (MA95-78): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0131 sq mi (75%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB50.0	Megansett Harbor	Approved	0.00000	0.0%
BB50.2	Rands Canal	Conditionally Approved	0.01309	75.5%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Rands Harbor (MA95-78) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Rands Harbor (MA95-78) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Rands Harbor (MA95-78): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0131 sq mi (75%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment		Alert
Not Assessed		NO
2022 Use Attainment Summary		
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Rands Harbor (MA95-78) so it is Not Assessed.		

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

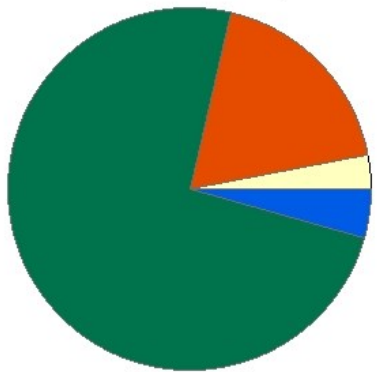
Summary
Rands Harbor (MA95-78): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0131 sq mi (75%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Red Brook (MA95-74)

Location:	Headwaters, outlet cranberry bogs east of Bartlett Pond, Wareham to Red Brook Road, Wareham/Plymouth.
AU Type:	RIVER
AU Size:	2.8 MILES
Classification/Qualifier:	B

RED BROOK - MA95-74

Watershed Area: 9.81 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	9.81	4.38	2.71	1.31
Agriculture	3%	3.6%	9.7%	10.1%
Developed	18.4%	12.5%	16.5%	13.2%
Natural	74.4%	76.6%	62.2%	58.6%
Wetland	4.3%	7.3%	11.6%	18.1%
Impervious Cover	7.3%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	2	None		Unchanged

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	

MA DFG biologists conducted backpack electrofishing at seven sites along Red Brook (MA95-74) (identified by DFG as a CFR) from upstream to downstream as follows: at the upstream end of the AU downstream of Century Bog, Wareham (SampleID 5297) in September 2014, three sites in the middle of the AU, just above Route 25, Wareham/Plymouth (SampleID 5295) in September 2014, above Rt. 25 to riffle above tributary, Wareham/Plymouth (SampleID 5806) in October 2015, and Rt. 25 xing, Wareham/Plymouth (SampleID 6713) in June 2017, and three sites at the downstream end of the AU (Section 6 & 7 in Lyman Preserve, adj to end of Downey St, Wareham/Plymouth (SampleID 5596) in July 2015, between antennas, sections 6 and 7, antenna 1 to old deflector, show and tell for Mass maritime summer camp, in dam removal section, Plymouth (SampleID 8526) in July 2019, and above Red Brook Rd between antennas, Wareham/Plymouth (SampleID 6710) in June 2017). At the upstream end of the AU (SampleID 5297) no coldwater species or fluvial individuals were documented (likely due to the proximity of the site to the Century Bog habitat) but moderately tolerant/intolerant macrohabitat generalists comprised 67% of the sample (chain pickerel and pumpkinseed. Further downstream in the middle and at downstream end of the AU, all six samples were indicative of excellent conditions, most being dominated by multiple age classes of Eastern brook trout (comprising 89, 100, 84, 85, 31, and 45% of the samples, respectively). DMF biologists note two potential barriers providing adequate passage to diadromous fish, both located roughly in the middle of the Red Brook AU. From upstream to downstream: The culvert under Rt. 25, was given a passage score of "1" on a 0-10 scale, indicating that the highway is only a minor obstruction to the passage of diadromous fish. DMF biologists noted that in-culvert baffles were recently removed, as they proved to not be necessary to maintain depth. Just downstream of Rt. 25 a channel restriction in the form of additional "in-stream baffles" was given a passage score of "1" on a 0-10 scale, indicating that the baffles are only a minor obstruction to the passage of diadromous fish. DMF noted that only minor annual maintenance of the stream weirs is required. The targeted species at both locations are river herring and American eel. Population scores were 5. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at two locations close to the downstream end of the brook in the summers of 2015 through 2019; just west of Archer St. (BBC_RBR2) and just upstream of Red Brook Rd (BBC_RBR1A). Monitoring was usually conducted in the surface waters, as well as occasionally deeper in the water column at BBC_RBR1A (average depth of 0.8m in 2016 and 0.7m in 2019) and was usually conducted weekly in the summer months (between 6 & 9am). The data were indicative of generally good conditions as follows: The max temperature was 22.1°C (n=207); >20°C only three times and >22°C only once (all at BBC_RBR1A); the minimum dissolved oxygen (DO) was 5.5mg/L (n=190), however all but 1 measurement was >6.0mg/L (supportive of coldwater fish). Total phosphorus sampling (n=38, max 0.177mg/L) in July and August documented seasonal average total phosphorus concentrations between 0.011-0.054mg/L. The maximum chlorophyll *a* concentration was 10.92µg/L (n=37). The only Secchi disk depth at BBC_RBR2 in 2016 was low (0.4m). Ammonia-nitrogen concentrations were generally low (range 0.006 to 0.045mg/L (n=38)), though TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for Red Brook (MA95-74) will continue to be assessed as Fully Supporting based on presence of multiple age classes of Eastern brook trout during the summer/fall of 2014, 2015, 2017, and 2019 (indicative of good habitat and water quality conditions) and the water quality data collected by BBC staff/volunteers between 2015 and 2019.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
5295	MassDFG	Fish Community	Red Brook	Just above Route 25, Wareham/Plymouth	41.77734	-70.63010
5297	MassDFG	Fish Community	Red Brook	Downstream of Century Bog, Wareham	41.79431	-70.63003
5596	MassDFG	Fish Community	Red Brook	Section 6 & 7 in Lyman Preserve, adj to end of Downey St, Wareham/Plymouth	41.76532	-70.63447
5806	MassDFG	Fish Community	Red Brook	Above Rt 25 to riffle above tributary, Wareham/Plymouth	41.77722	-70.63017
6710	MassDFG	Fish Community	Red Brook	Above Red Brook Rd between antennas, Wareham/Plymouth	41.76479	-70.63383
6713	MassDFG	Fish Community	Red Brook	Route 25 xing, Wareham/Plymouth	41.77596	-70.63071

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
8526	MassDFG	Fish Community	Red Brook	between antennas, sections 6 and 7, antenna 1 to old deflector, show and tell for Mass maritime summer camp, in dam removal section, Plymouth	41.76507	-70.63409

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_RBR1A	Buzzards Bay Coalition	Water Quality	Red Brook River	Red Brook River, Plymouth/Wareham	41.763611	-70.632753
BBC_RBR2	Buzzards Bay Coalition	Water Quality	Red Brook River	Red Brook River, Plymouth/Wareham	41.766773	-70.635237

Biological Monitoring Information

Fish Community Data and DELTS

Fish Community Data (2012-2019) Provided by MassDFG. (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net]

[Species List: A = Alewife, AE = American Eel, B = Bluegill, EBT = Brook Trout, FSS = Fourspine Stickleback, LMB = Largemouth Bass, NSS = Ninespine Stickleback, P = Pumpkinseed]

Sample ID	Sample Date	Method	Sample Type	Total Taxa	Total Ind	EBT Ind	EBT Min Length (mm)	EBT Max Length (mm)	EBT ≤140mm Ind	SC Ind	Cold Ind %	Fluvial Ind %	Notables	CFR	Species List
5295	09/04/14	BP	TP	2	19	17	80	228	11	0	89%	89%	No	Yes	EBT, P,
5596	07/14/15	BP	TP	3	46	39	64	307	16	0	85%	85%	Yes	Yes	AE, EBT, FSS,
5806	10/22/15	BP	TP	1	20	20	87	203	14	0	100%	100%	Yes	Yes	EBT,
6710	06/27/17	BP	TP	5	33	15	61	400	7	0	45%	45%	Yes	Yes	AE, EBT, FSS, LMB, P,
6713	06/29/17	BP	TP	4	58	49	57	292	17	0	84%	84%	No	Yes	AE, B, EBT, P,
8526	07/22/19	BP	TP	6	39	12	60	227	5	0	31%	31%	No	Yes	A, AE, EBT, FSS, NSS, P,

Fish Community Data (2012-2019) Provided by MassDFG. (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net, Gradient: H = High, L = Low; I/MT MG= Intolerant/Moderately Tolerant Macrohabitat Generalist]

[Species List: AE = American Eel, B = Bluegill, BB = Brown Bullhead, CP = Chain Pickerel, P = Pumpkinseed]

Sample ID	Sample Date	Method	Sample Type	Gradient	Total Taxa	Total Ind	Cold Ind %	Fluvial Taxa	Fluvial Ind %	Intol Ind %	I/MT MG Taxa	I/MT MG Ind %	Notables	CFR	Species List
5297	09/04/14	BP	TP		5	15	0%	0	0%	0%	2	67%	No	Yes	AE, B, BB, CP, P,

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary

DMF biologists note two potential barriers providing adequate passage to diadromous fish, both located roughly in the middle of the Red Brook AU. The targeted species at both locations are river herring and American eel with a population score of "5". From upstream to downstream: The culvert under Rt.25, was given a passage score of "1" on a 0-10 scale, indicating that the highway is only a minor obstruction to the passage of diadromous fish. DMF biologists noted that in-culvert baffles were recently removed as they proved to not be necessary to maintain depth. Just downstream of Rt.25 a channel restriction in the form of additional "in-stream baffles" was given a passage score of "1" on a 0-10 scale, indicating that the baffles are only a minor obstruction to the passage of diadromous fish. DMF noted that there is no pending project at this location and only minor annual maintenance of stream weirs is required.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Freshwater Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Average Sample depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
BBC_RBR1A	05/28/15	09/23/15	0.1	18	7.0	9.9	0	0	0
BBC_RBR1A	06/01/16	09/16/16	0.2	19	5.5	8.2	0	0	0
BBC_RBR1A	09/16/16	09/16/16	0.8	1	6.8	6.8	0	0	0
BBC_RBR1A	05/31/17	09/16/17	0.1	21	6.5	7.9	0	0	0
BBC_RBR1A	05/31/18	09/18/18	0.1	21	7.5	9.0	0	0	0
BBC_RBR1A	06/11/18	06/21/18	0.2	2	8.8	9.2	0	0	0
BBC_RBR1A	05/30/19	08/15/19	0.1	14	6.0	8.5	0	0	0
BBC_RBR1A	08/13/19	08/15/19	0.7	2	6.6	6.7	0	0	0
BBC_RBR2	05/28/15	09/23/15	0.2	18	9.0	10.1	0	0	0
BBC_RBR2	06/01/16	08/31/16	0.2	17	7.5	9.0	0	0	0
BBC_RBR2	05/31/17	09/16/17	0.2	21	8.0	8.6	0	0	0
BBC_RBR2	06/04/18	09/19/18	0.2	21	8.0	8.7	0	0	0
BBC_RBR2	05/30/19	08/15/19	0.2	15	8.5	9.2	0	0	0

Buzzards Bay Coalition Discrete Freshwater Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_RBR1A	05/28/15	09/23/15	0.1	21	18	21.0	13.9	1	0	0	0
BBC_RBR1A	06/01/16	09/16/16	0.2	22	21	20.0	14.8	0	0	0	0
BBC_RBR1A	09/16/16	09/16/16	0.8	1	0	16.9	16.9	--	--	--	--
BBC_RBR1A	05/31/17	09/16/17	0.1	25	23	19.1	14.3	0	0	0	0
BBC_RBR1A	05/31/18	09/18/18	0.1	24	22	22.1	15.1	1	1	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_RBR1A	06/11/18	06/21/18	0.2	2	2	13.9	13.2	0	0	0	0
BBC_RBR1A	05/30/19	08/15/19	0.1	18	17	20.5	15.7	1	0	0	0
BBC_RBR1A	08/13/19	08/15/19	0.7	2	2	19.0	18.1	0	0	0	0
BBC_RBR2	05/28/15	09/23/15	0.2	21	18	16.2	13.2	0	0	0	0
BBC_RBR2	06/01/16	08/31/16	0.2	21	21	17.5	14.6	0	0	0	0
BBC_RBR2	05/31/17	09/16/17	0.2	25	23	16.1	14.0	0	0	0	0
BBC_RBR2	06/04/18	09/19/18	0.2	24	23	18.0	14.6	0	0	0	0
BBC_RBR2	05/30/19	08/15/19	0.2	18	17	17.4	15.3	0	0	0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Freshwater Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	DO Sat Max (%)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count >16µg/L
BBC_RBR1A	2015	0.2	4	0.009	0.028	0.020	--	4	1.22	2.04	1.65	0
BBC_RBR1A	2016	0.3	4	0.009	0.015	0.014	--	4	0.75	3.17	1.69	0
BBC_RBR1A	2017	0.1	4	0.015	0.015	0.015	--	3	0.81	1.77	1.39	0
BBC_RBR1A	2018	0.1	3	0.015	0.015	0.015	--	3	1.23	2.37	1.62	0
BBC_RBR1A	2019	0.1	4	0.009	0.013	0.011	--	4	0.48	10.92	6.22	0
BBC_RBR2	2015	0.2	4	0.008	0.029	0.022	--	4	0.47	0.87	0.64	0
BBC_RBR2	2016	0.2	4	0.008	0.177	0.054	--	4	0.86	2.03	1.29	0
BBC_RBR2	2017	0.2	4	0.015	0.015	0.015	--	4	0.54	2.57	1.12	0
BBC_RBR2	2018	0.2	3	0.015	0.015	0.015	--	3	0.86	1.03	0.95	0
BBC_RBR2	2019	0.2	4	0.008	0.013	0.011	--	4	0.14	1.48	1.04	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_RBR2	07/05/16	07/05/16	1	0.4	0.4	0.4

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_RBR1A	07/13/15	08/25/15	0.2	4	0.014	0.037	0.025
BBC_RBR1A	07/05/16	08/15/16	0.3	4	0.016	0.045	0.027

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_RBR1A	07/06/17	08/17/17	0.1	4	0.018	0.032	0.026
BBC_RBR1A	07/10/18	08/07/18	0.1	3	0.014	0.031	0.023
BBC_RBR1A	07/11/19	08/15/19	0.1	4	0.010	0.025	0.018
BBC_RBR2	07/13/15	08/25/15	0.2	4	0.010	0.017	0.013
BBC_RBR2	07/05/16	08/15/16	0.2	4	0.009	0.012	0.011
BBC_RBR2	07/06/17	08/17/17	0.2	4	0.006	0.011	0.009
BBC_RBR2	07/10/18	08/07/18	0.2	3	0.012	0.019	0.016
BBC_RBR2	07/11/19	08/15/19	0.2	4	0.007	0.009	0.008

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Red Brook (MA95-74); therefore the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Red Brook (MA95-74) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E. coli</i> bacteria data are available to assess the Primary Contact Recreational Use for Red Brook (MA95-74) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E. coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Red Brook (MA95-74) so it is Not Assessed.	

Red Brook Harbor (MA95-18)

Location:	From the confluence with Pocasset Harbor between the northern portion of Bassetts Island and Patuisset, Bourne to the mouth at Buzzards Bay between the southern portion of Bassetts Island and Scraggy Neck, Bourne (including Hen Cove).
AU Type:	ESTUARY
AU Size:	0.92 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Estuarine Bioassessments		Unchanged
5	5	Fecal Coliform	36172	Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)	X					

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented a complete loss of the eelgrass bed habitat in Red Brook Harbor by 2013. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at six locations in Red Brook Harbor, Bourne (MA95-18) in the summers of 2015-2019, from inner to outer as follows: from docks/beaches at the north/inner end (Hens Cove) (BBC_HC and HC1), and further out along the east shore, south of Handy Point (BBC_RB4 and RB1), then also in the middle/open waters of the AU (BBC_RB3 and RB2). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at most locations (at depths ranging 0.6-2.7m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 30.0°C (n=580); >29.4°C three times (at BBC_RB3 in 2019 at the surface and at depth as well as at BBC_RB4 in 2016). The minimum dissolved oxygen (DO) was 2.0mg/L (n=530); <6.0mg/L 130 times (~25% of the measurements overall) and <5.0mg/L 32 times (~6% of the measurements overall). Excursions from the 6.0mg/L criterion occurred most frequently close to the northern shorelines of both Hen Cove (BBC_HC2) and Red Brook Harbor (BBC_RB4) with excursions at BBC_RB4 being the most frequently and consistently severe (i.e., <5mg/L). Total nitrogen sampling (n=63, maximum 1.37mg/L) during ebb tides in July and August documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.34-0.73mg/L: 8/10 averages were >0.4mg/L, particularly at the northern shoreline of Red Brook Harbor (BBC_RB4) and the east shoreline of Hen Cove (BBC_HC1). The maximum Chlorophyll *a* was 11.63µg/L (n=128); >5µg/L 42 times and >10µg/L only 6 times (5%). Generally weekly Secchi disk depths throughout the AU in the summers of 2015-2019 ranged from 1.9 to 2.9m (n=212). Ammonia-nitrogen concentrations were low (range 0.004 to 0.09mg/L (n=134)), but TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for Red Brook Harbor (MA95-18) will continue to be assessed as Not Supporting based on the complete loss of eelgrass bed habitat documented by the MassDEP Eelgrass Mapping Project between 1995 and 2017 and the data collected by BBC staff/volunteers in the summers of 2015-2019. The Estuarine Bioassessments and Nutrient Eutrophication Biological Indicators impairments are both being carried forward.

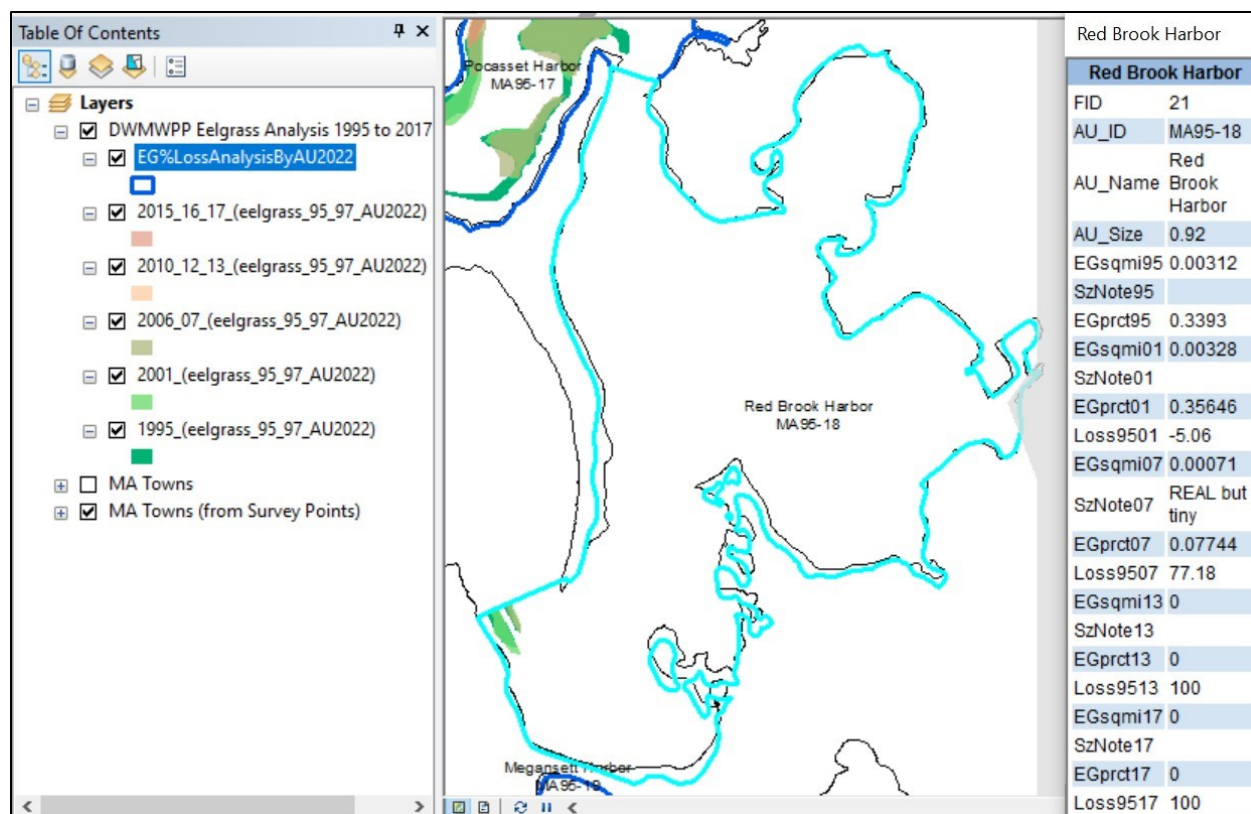
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_HC1	Buzzards Bay Coalition	Water Quality	Hen Cove	Hen Cove, Bourne	41.681135	-70.620415
BBC_HC2	Buzzards Bay Coalition	Water Quality	Hen Cove	Hen Cove, Bourne	41.685763	-70.61925
BBC_RB1	Buzzards Bay Coalition	Water Quality	Red Brook Harbor	Red Brook Harbor Inner, Bourne	41.674697	-70.615118
BBC_RB2	Buzzards Bay Coalition	Water Quality	Red Brook Harbor	Red Brook Harbor Outer, Bourne	41.674365	-70.62195
BBC_RB3	Buzzards Bay Coalition	Water Quality	Red Brook Harbor	Red Brook Harbor Outer, Bourne	41.674757	-70.627456
BBC_RB4	Buzzards Bay Coalition	Water Quality	Red Brook Harbor	Red Brook Harbor Inner, Bourne	41.678564	-70.619073

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Red Brook Harbor MA95-18 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented a complete loss of the eelgrass bed habitat in Red Brook Harbor by 2013.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_HC1	06/16/15	09/23/15	0.2	5	8.0	8.9	0	0	0
BBC_HC1	05/29/15	09/19/15	0.7	21	7.5	9.1	0	0	0
BBC_HC1	08/16/16	09/23/16	0.3	4	6.5	7.6	0	0	0
BBC_HC1	05/31/16	09/17/16	0.6	20	6.0	8.1	0	0	0
BBC_HC1	06/07/17	09/19/17	0.3	6	6.0	7.0	0	0	0
BBC_HC1	05/31/17	09/16/17	0.7	18	7.0	7.7	0	0	0
BBC_HC1	05/30/18	09/20/18	0.6	21	5.0	6.7	10	0	0
BBC_HC1	07/02/19	09/14/19	0.2	5	6.9	7.7	0	0	0
BBC_HC1	05/31/19	09/23/19	0.7	22	6.5	7.6	0	0	0
BBC_HC2	05/29/15	09/24/15	0.2	15	4.5	6.8	20	7	0
BBC_HC2	06/19/15	09/24/15	2.3	12	4.5	7.0	8	8	0
BBC_HC2	06/22/16	09/25/16	0.2	9	5.5	6.6	22	0	0
BBC_HC2	06/22/16	09/25/16	2.1	9	4.0	6.2	22	11	0
BBC_HC2	05/31/17	09/06/17	0.2	14	4.9	6.3	36	7	0
BBC_HC2	05/31/17	09/06/17	2.0	13	5.2	6.3	31	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_HC2	05/30/18	09/19/18	0.2	20	5.0	6.1	35	0	0
BBC_HC2	05/30/18	09/19/18	2.0	20	5.5	6.4	10	0	0
BBC_HC2	08/15/19	09/10/19	0.2	5	4.9	6.2	60	20	0
BBC_HC2	08/22/19	09/10/19	1.5	4	5.4	6.0	50	0	0
BBC_RB1	06/09/15	09/23/15	0.2	16	5.0	7.5	6	0	0
BBC_RB1	06/11/15	09/23/15	2.4	18	5.0	7.2	22	0	0
BBC_RB1	05/31/16	09/23/16	0.2	16	7.0	8.1	0	0	0
BBC_RB1	05/31/16	09/23/16	2.3	16	7.0	8.3	0	0	0
BBC_RB1	05/31/17	08/11/17	0.3	15	5.8	6.9	7	0	0
BBC_RB1	05/31/17	08/11/17	2.4	15	5.5	6.6	13	0	0
BBC_RB1	08/15/19	09/10/19	0.2	5	6.1	6.4	0	0	0
BBC_RB1	08/22/19	09/10/19	2.7	4	5.6	6.3	50	0	0
BBC_RB2	08/15/19	08/15/19	0.2	1	6.5	6.5	0	0	0
BBC_RB3	07/13/15	09/24/15	0.2	10	5.0	7.4	10	0	0
BBC_RB3	07/13/15	09/24/15	1.1	11	5.5	7.2	9	0	0
BBC_RB3	06/16/16	09/19/16	0.2	7	6.0	6.7	0	0	0
BBC_RB3	06/16/16	09/19/16	1.0	9	5.5	6.9	11	0	0
BBC_RB3	07/02/18	09/16/18	0.2	12	5.5	6.6	8	0	0
BBC_RB3	07/02/18	09/16/18	1.7	12	5.0	6.3	25	0	0
BBC_RB3	07/20/19	09/09/19	0.2	7	6.6	7.4	0	0	0
BBC_RB3	07/20/19	09/09/19	1.4	6	6.5	7.2	0	0	0
BBC_RB4	07/16/15	09/19/15	0.2	8	3.5	5.2	88	13	13
BBC_RB4	07/16/15	09/19/15	1.3	13	3.5	5.0	92	15	8
BBC_RB4	06/06/16	09/20/16	0.2	15	3.0	5.0	67	33	13
BBC_RB4	05/31/16	09/24/16	1.2	19	4.0	5.4	74	21	0
BBC_RB4	07/11/17	09/16/17	0.2	11	4.0	5.7	64	9	0
BBC_RB4	07/11/17	09/16/17	1.4	13	3.5	5.5	46	23	8
BBC_RB4	07/09/18	09/15/18	0.2	10	2.0	4.8	80	30	20
BBC_RB4	07/09/18	09/15/18	1.3	9	3.5	4.5	100	67	11
BBC_RB4	08/15/19	09/10/19	0.2	5	5.2	5.9	60	0	0
BBC_RB4	08/22/19	09/10/19	1.5	4	4.4	5.2	75	50	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_HC1	06/16/15	09/23/15	0.2	9	8	26.0	23.3	0
BBC_HC1	05/29/15	09/19/15	0.7	21	19	26.0	22.0	0
BBC_HC1	07/05/16	09/23/16	0.2	8	6	28.0	26.3	0
BBC_HC1	05/31/16	09/17/16	0.6	20	18	26.0	21.9	0
BBC_HC1	06/07/17	09/19/17	0.2	10	9	26.0	22.4	0
BBC_HC1	05/31/17	09/16/17	0.7	18	16	26.5	20.8	0
BBC_HC1	07/10/18	08/21/18	0.2	4	4	26.0	23.6	0
BBC_HC1	05/30/18	09/20/18	0.6	21	19	25.0	21.2	0
BBC_HC1	07/02/19	09/14/19	0.2	5	5	24.3	21.3	0
BBC_HC1	05/31/19	09/23/19	0.7	22	19	25.0	20.6	0
BBC_HC2	05/29/15	09/24/15	0.2	19	17	28.0	22.3	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_HC2	06/19/15	09/24/15	2.3	12	11	25.0	22.5	0
BBC_HC2	06/22/16	09/25/16	0.2	13	11	28.0	25.2	0
BBC_HC2	06/22/16	09/25/16	2.3	9	7	28.0	24.7	0
BBC_HC2	05/31/17	09/06/17	0.2	18	17	25.9	22.6	0
BBC_HC2	05/31/17	09/06/17	2.0	13	12	24.8	22.3	0
BBC_HC2	05/30/18	09/19/18	0.2	24	22	26.9	22.7	0
BBC_HC2	05/30/18	09/19/18	2.0	20	18	27.3	22.8	0
BBC_HC2	08/15/19	09/10/19	0.2	5	5	25.1	22.7	0
BBC_HC2	08/22/19	09/10/19	1.5	4	4	25.9	22.7	0
BBC_RB1	06/09/15	09/23/15	0.2	21	19	27.0	23.4	0
BBC_RB1	06/11/15	09/23/15	2.3	21	19	28.0	24.2	0
BBC_RB1	05/31/16	09/23/16	0.2	20	16	28.0	24.8	0
BBC_RB1	05/31/16	09/23/16	2.5	19	15	27.5	24.6	0
BBC_RB1	05/31/17	08/17/17	0.2	21	20	25.7	22.5	0
BBC_RB1	05/31/17	08/17/17	2.5	20	19	25.7	22.8	0
BBC_RB1	07/10/18	08/21/18	0.2	4	4	24.5	22.8	0
BBC_RB1	07/24/18	08/21/18	2.7	3	3	24.5	22.8	0
BBC_RB1	08/15/19	09/10/19	0.2	5	5	25.1	22.9	0
BBC_RB1	08/22/19	09/10/19	2.7	4	4	26.0	23.2	0
BBC_RB2	07/13/15	08/25/15	0.2	4	4	26.0	23.8	0
BBC_RB2	07/05/16	08/15/16	0.2	4	4	28.0	27.0	0
BBC_RB2	07/06/17	08/17/17	0.2	4	4	26.0	24.6	0
BBC_RB2	07/10/18	08/21/18	0.2	4	4	25.0	23.0	0
BBC_RB2	08/15/19	08/15/19	0.2	1	1	24.0	24.0	0
BBC_RB3	07/13/15	08/25/15	0.2	4	4	26.0	23.3	0
BBC_RB3	07/13/15	08/25/15	2.5	4	4	25.0	23.4	0
BBC_RB3	06/16/16	09/19/16	0.2	11	10	28.0	25.4	0
BBC_RB3	06/16/16	09/19/16	1.5	11	10	28.0	24.4	0
BBC_RB3	07/06/17	08/17/17	0.2	4	4	25.8	24.4	0
BBC_RB3	07/06/17	08/17/17	2.7	4	4	25.8	24.2	0
BBC_RB3	07/02/18	09/16/18	0.2	16	15	28.0	24.7	0
BBC_RB3	07/02/18	09/16/18	1.9	15	14	26.5	24.5	0
BBC_RB3	07/20/19	09/09/19	0.2	7	7	30.0	24.1	1
BBC_RB3	07/20/19	09/09/19	1.4	6	6	30.0	24.0	1
BBC_RB4	07/13/15	09/19/15	0.2	13	12	26.0	23.6	0
BBC_RB4	07/16/15	09/19/15	1.3	13	12	26.0	23.6	0
BBC_RB4	06/06/16	09/20/16	0.2	19	17	30.0	24.8	1
BBC_RB4	05/31/16	09/24/16	1.2	18	14	27.0	23.6	0
BBC_RB4	07/06/17	09/16/17	0.2	16	15	26.1	23.1	0
BBC_RB4	07/11/17	09/16/17	1.4	12	11	25.6	22.9	0
BBC_RB4	07/09/18	09/15/18	0.2	15	15	27.0	24.4	0
BBC_RB4	07/09/18	09/15/18	1.3	9	9	27.0	24.9	0
BBC_RB4	08/15/19	09/10/19	0.2	5	5	25.4	22.8	0
BBC_RB4	08/22/19	09/10/19	1.5	4	4	25.6	22.9	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_HC1	2015	0.2	1	0.40	0.40	0.40	3	4.42	7.07	5.51	2	0
BBC_HC1	2016	0.2	--	--	--	--	4	2.97	4.64	3.93	4	0
BBC_HC1	2017	0.2	3	0.35	0.62	0.52	4	4.24	9.62	6.30	2	0
BBC_HC1	2018	0.2	4	0.33	0.93	0.53	4	2.94	8.04	5.17	2	0
BBC_HC1	2019	0.2	--	--	--	--	1	11.07	11.07	11.07	0	1
BBC_HC2	2015	0.2	2	0.34	0.38	0.36	4	3.92	6.70	4.94	3	0
BBC_HC2	2016	0.2	4	0.36	0.53	0.42	4	3.89	8.72	5.78	2	0
BBC_HC2	2017	0.2	1	0.33	0.33	0.33	4	3.81	5.97	4.49	3	0
BBC_HC2	2018	0.2	4	0.33	0.77	0.49	4	2.73	7.06	4.98	2	0
BBC_HC2	2019	0.2	1	0.51	0.51	0.51	1	10.90	10.90	10.90	0	1
BBC_RB1	2015	0.2	4	0.29	0.65	0.45	3	3.61	10.47	6.22	2	1
BBC_RB1	2015	2.4	2	0.40	0.53	0.46	4	5.49	11.14	7.18	0	1
BBC_RB1	2016	0.2	4	0.33	0.43	0.37	4	3.79	4.66	4.20	4	0
BBC_RB1	2016	2.8	1	0.36	0.36	0.36	4	3.52	9.60	6.54	1	0
BBC_RB1	2017	0.5	1	0.45	0.45	0.45	4	3.33	4.51	3.92	4	0
BBC_RB1	2017	2.1	--	--	--	--	4	5.77	8.02	7.00	0	0
BBC_RB1	2018	0.2	4	0.34	0.50	0.42	4	3.11	6.41	4.65	2	0
BBC_RB1	2018	2.1	3	0.37	0.49	0.42	4	5.90	11.63	7.94	0	1
BBC_RB1	2019	0.2	1	0.30	0.30	0.30	1	1.78	1.78	1.78	1	0
BBC_RB2	2015	0.2	2	0.30	0.37	0.33	3	2.64	7.46	4.38	2	0
BBC_RB2	2016	0.2	1	0.28	0.28	0.28	4	3.18	4.22	3.55	4	0
BBC_RB2	2017	0.2	1	0.49	0.49	0.49	4	2.64	4.01	3.39	4	0
BBC_RB2	2018	0.2	1	0.37	0.37	0.37	4	2.89	3.89	3.43	4	0
BBC_RB2	2019	0.2	--	--	--	--	1	4.55	4.55	4.55	1	0
BBC_RB3	2015	0.2	2	0.38	0.58	0.48	3	3.07	6.50	4.37	2	0
BBC_RB3	2015	2.5	1	0.54	0.54	0.54	3	2.98	5.87	4.43	2	0
BBC_RB3	2016	0.2	1	0.32	0.32	0.32	4	2.42	3.06	2.80	4	0
BBC_RB3	2016	2.8	4	0.31	0.41	0.34	4	2.86	3.33	3.16	4	0
BBC_RB3	2017	0.2	--	--	--	--	4	2.42	4.24	3.22	4	0
BBC_RB3	2017	2.7	--	--	--	--	4	2.84	4.50	3.64	4	0
BBC_RB3	2018	0.2	2	0.41	0.68	0.55	4	2.89	3.66	3.23	4	0
BBC_RB3	2018	2.8	1	0.36	0.36	0.36	4	2.68	4.06	3.55	4	0
BBC_RB3	2019	0.2	--	--	--	--	1	3.70	3.70	3.70	1	0
BBC_RB4	2015	0.2	3	0.37	1.37	0.73	3	2.49	8.71	5.34	2	0
BBC_RB4	2016	0.2	1	0.46	0.46	0.46	4	4.45	7.54	5.59	1	0
BBC_RB4	2017	0.2	1	0.34	0.34	0.34	4	2.44	5.71	4.04	3	0
BBC_RB4	2018	0.2	2	0.35	0.49	0.42	4	4.34	10.13	6.56	1	1
BBC_RB4	2019	0.2	--	--	--	--	1	3.97	3.97	3.97	1	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_HC1	07/13/15	08/25/15	4	1.0	1.9	1.5
BBC_HC1	07/05/16	07/05/16	1	1.9	1.9	1.9
BBC_HC1	07/06/17	08/17/17	4	1.6	1.7	1.7
BBC_HC1	07/24/18	08/07/18	2	1.2	1.5	1.4
BBC_HC2	05/29/15	09/24/15	18	1.2	2.1	1.6
BBC_HC2	06/22/16	09/25/16	13	1.3	1.8	1.5
BBC_HC2	05/31/17	09/06/17	12	1.4	1.9	1.6
BBC_HC2	05/30/18	09/19/18	23	1.2	2.3	1.6
BBC_HC2	08/22/19	08/22/19	1	1.5	1.5	1.5
BBC_RB1	06/09/15	09/23/15	22	1.3	2.6	1.8
BBC_RB1	05/31/16	09/23/16	19	1.5	2.9	2.0
BBC_RB1	05/31/17	08/17/17	19	1.3	2.7	2.0
BBC_RB1	07/10/18	08/21/18	4	1.7	1.9	1.8
BBC_RB1	08/15/19	09/10/19	5	2.0	2.7	2.4
BBC_RB2	07/13/15	08/25/15	4	1.9	2.5	2.1
BBC_RB2	07/05/16	08/15/16	4	2.0	2.6	2.2
BBC_RB2	07/06/17	08/17/17	4	2.0	2.6	2.2
BBC_RB2	07/10/18	08/21/18	4	2.1	2.6	2.3
BBC_RB2	08/15/19	08/15/19	1	2.6	2.6	2.6
BBC_RB3	07/13/15	08/25/15	4	1.9	2.7	2.3
BBC_RB3	07/05/16	08/15/16	4	2.0	2.5	2.2
BBC_RB3	07/06/17	08/17/17	4	1.9	2.7	2.2
BBC_RB3	07/02/18	08/28/18	8	1.5	2.4	1.9
BBC_RB4	07/13/15	09/14/15	11	1.1	1.9	1.6
BBC_RB4	06/17/16	09/17/16	7	1.6	2.0	1.8
BBC_RB4	07/06/17	09/05/17	5	1.7	2.2	1.9
BBC_RB4	07/10/18	08/21/18	5	1.0	1.8	1.5

Toxics and other pollutants (metals, ammonia, chlorine)**Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_HC1	07/13/15	08/25/15	0.2	4	0.006	0.012	0.010
BBC_HC1	07/05/16	08/15/16	0.2	4	0.005	0.008	0.007
BBC_HC1	07/06/17	08/17/17	0.2	4	0.004	0.016	0.010
BBC_HC1	07/10/18	08/21/18	0.2	4	0.005	0.039	0.015
BBC_HC1	08/15/19	08/15/19	0.2	1	0.004	0.004	0.004
BBC_HC2	07/13/15	08/25/15	0.2	4	0.008	0.014	0.011
BBC_HC2	07/05/16	08/15/16	0.2	4	0.007	0.014	0.010
BBC_HC2	07/06/17	08/17/17	0.2	4	0.004	0.007	0.005
BBC_HC2	07/10/18	08/21/18	0.2	4	0.005	0.032	0.013
BBC_HC2	08/15/19	08/15/19	0.2	1	0.006	0.006	0.006

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_RB1	07/13/15	08/25/15	0.2	4	0.010	0.037	0.018
BBC_RB1	07/13/15	08/25/15	2.4	4	0.007	0.036	0.019
BBC_RB1	07/05/16	08/15/16	0.2	4	0.009	0.028	0.016
BBC_RB1	07/05/16	08/15/16	2.8	4	0.004	0.009	0.007
BBC_RB1	07/06/17	08/17/17	0.2	4	0.004	0.011	0.006
BBC_RB1	07/06/17	08/17/17	2.7	4	0.004	0.010	0.006
BBC_RB1	07/10/18	08/21/18	0.2	4	0.010	0.027	0.019
BBC_RB1	07/10/18	08/21/18	2.7	4	0.004	0.009	0.006
BBC_RB1	08/15/19	08/15/19	0.2	1	0.019	0.019	0.019
BBC_RB2	07/13/15	08/25/15	0.2	4	0.007	0.013	0.010
BBC_RB2	07/05/16	08/15/16	0.2	4	0.004	0.019	0.009
BBC_RB2	07/06/17	08/17/17	0.2	4	0.004	0.011	0.006
BBC_RB2	07/10/18	08/21/18	0.2	4	0.004	0.006	0.005
BBC_RB2	08/15/19	08/15/19	0.2	1	0.004	0.004	0.004
BBC_RB3	07/13/15	08/25/15	0.2	4	0.007	0.026	0.018
BBC_RB3	07/13/15	08/25/15	2.5	4	0.007	0.022	0.013
BBC_RB3	07/05/16	08/15/16	0.2	4	0.005	0.006	0.006
BBC_RB3	07/05/16	08/15/16	2.8	4	0.007	0.014	0.010
BBC_RB3	07/06/17	08/17/17	0.2	4	0.004	0.008	0.005
BBC_RB3	07/06/17	08/17/17	2.7	4	0.004	0.007	0.005
BBC_RB3	07/10/18	08/21/18	0.2	4	0.004	0.017	0.007
BBC_RB3	07/10/18	08/21/18	2.8	4	0.004	0.008	0.005
BBC_RB3	08/15/19	08/15/19	0.2	1	0.004	0.004	0.004
BBC_RB4	07/13/15	08/25/15	0.2	4	0.006	0.094	0.033
BBC_RB4	07/05/16	08/15/16	0.2	4	0.005	0.011	0.008
BBC_RB4	07/06/17	08/17/17	0.2	4	0.006	0.011	0.008
BBC_RB4	07/10/18	08/21/18	0.2	4	0.004	0.016	0.010
BBC_RB4	08/15/19	08/15/19	0.2	1	0.008	0.008	0.008

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Red Brook Harbor (MA95-18); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Red Brook Harbor (MA95-18): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.8611 sq mi (94%). The approved shellfish growing area represents 0.592 sq mi (64%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is <100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB49.0	Pocasset And Red Brook Harbor	Approved	0.59204	64.5%
BB49.1	Red Brook Harbor	Conditionally Approved	0.19957	21.7%
BB49.2	Kingman Yacht Center	Prohibited	0.01607	1.8%
BB49.5	Hen Cove	Prohibited	0.01135	1.2%
BB49.7	Hospital Cove Mooring Area	Conditionally Approved	0.04209	4.6%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Red Brook Harbor (MA95-18) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There are three beaches in Red Brook Harbor (MA95-18), all located in the area locally known as “Hen Cove” at the inner end of the AU. The names and ID codes for the beaches are as follows: Pocasset Beach Improvement Association (ID 2659), Cedar Point Association (ID 2662), and Patuisset Beach (ID 5215). These beaches were almost never posted for swimming advisories between 2014 and 2019 (only Cedar Point Association Beach was posted in 2014 for 4% of the bathing season).</p> <p>The Primary Contact Recreational Use for Red Brook Harbor (MA95-18) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the Pocasset Beach Improvement Association, Cedar Point Association, or Patuisset beaches between 2014 and 2019.</p>	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2659	Pocasset Beach Improvement Association/Bourne	41.68646	-70.62260	41.68671	-70.62040	0%	0%	0%	0%	0%	0%	0
2662	Cedar Point Association/Bourne	41.68170	-70.62020	41.68104	-70.62010	4%	0%	0%	0%	0%	0%	0
5215	Patuisset Beach/Bourne	41.68240	-70.62480	41.68200	-70.62490	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Red Brook Harbor (MA95-18): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.8611 sq mi (94%). The approved shellfish growing area represents 0.592 sq mi (64%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There are three beaches in Red Brook Harbor (MA95-18), all located in the area locally known as “Hen Cove” at the inner end of the AU. The names and ID codes for the beaches are as follows: Pocasset Beach Improvement Association (ID 2659), Cedar Point Association (ID 2662), and Patuisset Beach (ID 5215). These beaches were almost never posted for swimming advisories between 2014 and 2019 (only Cedar Point Association Beach was posted in 2014 for 4% of the bathing season).</p> <p>The Secondary Contact Recreational Use for Red Brook Harbor (MA95-18) is assessed as Fully Supporting, since there were very few, if any, swimming advisory postings at the Pocasset Beach Improvement Association, Cedar Point Association, or Patuisset beaches between 2014 and 2019.</p>	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Red Brook Harbor (MA95-18): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.8611 sq mi (94%). The approved shellfish growing area represents 0.592 sq mi (64%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Red Brook Pond (MA95-96256)

Location:	Bourne.
AU Type:	FRESHWATER LAKE
AU Size:	16 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	4c	(Fish Passage Barrier*)		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Habitat Modification - other than Hydromodification (Y)	X				

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary DMF biologists note two structures causing passage limitation to diadromous fish travelling up from Red Brook Harbor (MA95-18) into Red Brook Pond (MA95-96256). The Red Brook Pond Dam was given a passage score of "3" on a 0-10 scale, indicating that the dam is only a minor obstruction to the passage of the targeted species, river herring and American eel. The population score in this area was 4". DMF biologists note that this dam is on the NRCS list as a potential repair job. A little further downstream on the unnamed tributary connecting Red Brook Harbor to Red Brook Pond (not an AU) DMF biologists note that a railroad track culvert (with an existing fishway) restricts the passage of the same target species (population score 4) with a passage score of "6" (restricted passage). The Buzzards Bay Coalition (BBC) staff/volunteers conducted a limited amount of discrete water quality monitoring at one location in Red Brook Pond, Bourne (MA95-96256) in the summer of 2015, at the southwest corner of the AU, just off Shore Rd (BBC_RBP2). Monitoring near the surface was conducted in July and August (between the hours of 6 and 9am). The maximum temperature was 24.5°C (n=2). Total phosphorus sampling in July and August documented a maximum concentration of 0.015mg/L (n=2). The maximum Chlorophyll <i>a</i> was 1.77µg/L (n=2). Ammonia-nitrogen concentrations were generally low (range 0.013 to 0.018mg/L (n=2)), though TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for Red Brook Pond (MA95-96256) is assessed as Not Supporting based on the barrier to diadromous fish passage up into Red Brook Pond from Red Brook Harbor (passage restriction at the railroad track culvert on the unnamed tributary just downstream of the outlet of Red Brook Pond). An impairment for Fish Passage Barrier is being added.	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_RBP2	Buzzards Bay Coalition	Water Quality	Red Brook Pond	Red Brook Pond, Bourne	41.676337	-70.610341

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note two structures causing passage limitation to diadromous fish travelling up from Red Brook Harbor (MA95-18) into Red Brook Pond. The Red Brook Pond Dam was given a passage score of "3" on a 0-10 scale, indicating that the dam is only a minor obstruction to the passage of the targeted species, river herring and American eel. The population score in this area was noted to be "4". DMF biologists note that this dam is on the NRCS list as a potential repair job. A little further downstream on an unnamed tributary (not an AU) DMF biologists note that a railroad track culvert, with an existing fishway restricts the passage of the same target species (population score 4) with a passage score of "6". The Aquatic Life Use for Red Brook Pond (Assessment Unit MA95-96256) is assessed as Not Supporting based on the barrier to diadromous fish passage at the railroad track culvert on the downstream unnamed tributary.

Physico-chemical Water Quality Information

DO, pH, Temperature (Depth Profiles)

Buzzards Bay Coalition Discrete Freshwater Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_RBP2	07/27/15	08/10/15	0.2	2	2	24.5	23.5	2	2	0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Freshwater Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	DO Sat Max (%)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count >16µg/L
BBC_RBP2	2015	0.2	2	0.015	0.015	0.015	-	2	1.48	1.77	1.63	0

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_RBP2	07/27/15	08/10/15	0.2	2	0.013	0.018	0.015

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Red Brook Pond (MA95-96256); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Red Brook Pond (MA95-96256) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococcus</i> or <i>E. coli</i> bacteria data are available to assess the status of the Primary Contact Recreation Use for Red Brook Pond (MA95-96256) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E. coli</i> bacteria data are available to assess the status of the Secondary Contact Recreation Use for Red Brook Pond (MA95-96256) so it is Not Assessed.	

Rocky Meadow Brook Pond (MA95118)

Location:	Carver.
AU Type:	FRESHWATER LAKE
AU Size:	11 ACRES
Classification/Qualifier:	B

No usable data were available for Rocky Meadow Brook Pond (MA95118) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Rocky Pond (MA95179)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	20 ACRES
Classification/Qualifier:	B

No usable data were available for Rocky Pond (MA95179) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Round Pond (MA95123)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	20 ACRES
Classification/Qualifier:	B

No usable data were available for Round Pond (MA95123) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Salters Point Pond (MA95-106)

Location:	west of Naushon Avenue, Dartmouth.
AU Type:	ESTUARY
AU Size:	0.08 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	5	Dissolved Oxygen		Added
--	5	Nitrogen, Total		Added
--	5	Nutrient/Eutrophication Biological Indicators		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Agriculture (N)	X					
Dissolved Oxygen	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (N)	X					
Dissolved Oxygen	Residential Districts (N)	X					
Nitrogen, Total	Agriculture (N)	X					
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (N)	X					
Nitrogen, Total	Residential Districts (N)	X					
Nutrient/Eutrophication Biological Indicators	Agriculture (N)	X					
Nutrient/Eutrophication Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (N)	X					
Nutrient/Eutrophication Biological Indicators	Residential Districts (N)	X					

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in Salters Point Pond, Dartmouth (MA95-106) in the summers of 2015-2019: middle of the pond (BBC_STP1N), end of a jetty along the south shore (BBC_STP1), and within the outlet channel (BBC_STP2). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column (at depths averaging 0.4m at BBC_STP1 and STP2) and was usually conducted weekly (between the hours of 6 and 9am) in the summers of 2015-2019. The maximum temperature was 28.0°C (n=108). The minimum dissolved oxygen (DO) was 0.5mg/L (n=91); <6.0mg/L 81 times (89% of all measurements) and <5.0mg/L 64 times (70% of all measurements). Total nitrogen sampling (n=10, maximum 3.41mg/L) during ebb tides in July and August documented a seasonal average total nitrogen concentration of 1.5mg/L at BBC_STP1N in 2018 (only site/year with n>2 samples). The maximum chlorophyll *a* was 214.9µg/L (n=34) at BBC_STP1 in 2015 (BBC noted the pond was “closed off” and the water “stagnant” at the time that sample was taken); >5µg/L 32 times and >10µg/L 28 times (82% of the measurements overall), with seasonal averages ranging from 9.4 to 88µg/L. Secchi disk depths between 2017 and 2019 at all three sample stations ranged from 0.3 to 0.5m (n=11). Ammonia-nitrogen ranged from 0.004 to 0.16mg/L (n=34), but TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use of Salters Point Pond (MA95-106) is assessed as Not Supporting based on evidence of nutrient enrichment (elevated Total Nitrogen and Chlorophyll *a* as well as low Dissolved Oxygen concentrations) documented by BBC staff/volunteers in 2015-2019. Impairments for Nutrient/Enrichment Biological Indicators, Total Nitrogen, and Dissolved Oxygen are being added, in agreement with the BBC comments made on the 2018/20 IR.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_STP1	Buzzards Bay Coalition	Water Quality	Salters Pond	Salters Pond, Dartmouth	41.529852	-70.951072
BBC_STP1N	Buzzards Bay Coalition	Water Quality	Salters Pond	Salters Pond, Dartmouth	41.530431	-70.952716
BBC_STP2	Buzzards Bay Coalition	Water Quality	Salters Pond	Salters Pond, Dartmouth	41.528597	-70.956215

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_STP1	06/10/15	08/29/15	0.1	14	2.0	4.7	85	62	38
BBC_STP1	07/28/17	08/07/17	0.2	2	3.0	3.5	100	100	50
BBC_STP1	08/16/17	09/21/17	0.4	8	2.0	3.4	100	63	63
BBC_STP1N	07/11/16	08/31/16	0.2	7	2.5	3.6	100	86	57
BBC_STP2	06/24/15	09/09/15	0.2	13	2.0	2.7	100	100	85
BBC_STP2	06/28/17	07/28/17	0.2	6	1.0	2.3	100	100	67
BBC_STP2	07/28/17	08/11/17	0.4	4	2.5	3.7	100	100	50
BBC_STP2	07/04/18	09/19/18	0.2	11	0.5	3.0	100	100	73
BBC_STP2	06/05/18	09/11/18	0.4	6	3.0	5.5	50	33	33
BBC_STP2	05/30/19	09/23/19	0.2	17	2.0	4.8	88	35	12
BBC_STP2	06/04/19	09/14/19	0.3	3	4.0	7.0	33	33	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_STP1	06/05/15	08/29/15	0.1	10	10	25.0	21.8	0
BBC_STP1	07/28/17	08/07/17	0.2	3	3	24.3	22.5	0
BBC_STP1	08/16/17	09/21/17	0.4	8	6	24.2	21.2	0
BBC_STP1N	07/05/16	08/31/16	0.2	8	8	27.0	22.0	0
BBC_STP1N	07/06/17	08/17/17	0.2	3	3	27.0	24.9	0
BBC_STP1N	07/10/18	08/21/18	0.2	3	3	27.0	23.5	0
BBC_STP1N	07/11/19	08/15/19	0.2	4	4	24.4	23.5	0
BBC_STP2	06/24/15	09/09/15	0.2	17	17	28.0	23.5	0
BBC_STP2	07/05/16	07/05/16	0.2	1	1	22.0	22.0	0
BBC_STP2	06/28/17	08/17/17	0.2	10	10	27.0	23.5	0
BBC_STP2	07/28/17	08/11/17	0.4	4	4	24.0	22.9	0
BBC_STP2	07/04/18	09/19/18	0.2	13	12	26.8	23.8	0
BBC_STP2	06/05/18	09/11/18	0.4	6	6	22.4	19.2	0
BBC_STP2	05/30/19	09/23/19	0.2	21	18	28.0	23.1	0
BBC_STP2	06/04/19	09/14/19	0.3	3	3	19.4	17.9	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_STP1	2015	0.2	--	--	--	--	3	16.22	214.92	88.00	0	3
BBC_STP1	2017	0.2	--	--	--	--	1	26.72	26.72	26.72	0	1
BBC_STP1N	2016	0.2	--	--	--	--	3	16.73	104.62	46.47	0	3
BBC_STP1N	2017	0.2	--	--	--	--	3	10.99	76.97	42.95	0	3
BBC_STP1N	2018	0.2	3	1.26	1.75	1.51	3	2.48	13.76	9.42	1	2
BBC_STP1N	2019	0.2	2	0.94	1.16	1.05	4	6.25	21.65	11.96	0	2
BBC_STP2	2015	0.2	2	2.40	3.41	2.91	4	5.26	53.46	33.05	0	3
BBC_STP2	2016	0.2	--	--	--	--	3	10.84	85.20	40.65	0	3
BBC_STP2	2017	0.2	--	--	--	--	4	21.76	50.43	33.65	0	4
BBC_STP2	2018	0.2	2	1.70	1.77	1.74	2	14.64	46.70	30.67	0	2
BBC_STP2	2019	0.2	1	1.11	1.11	1.11	4	3.98	24.70	12.69	1	2

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_STP1	09/17/17	09/17/17	1	0.5	0.5	0.5
BBC_STP1N	07/06/17	07/06/17	1	0.4	0.4	0.4
BBC_STP1N	08/21/18	08/21/18	1	0.4	0.4	0.4

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_STP1N	08/15/19	08/15/19	1	0.5	0.5	0.5
BBC_STP2	07/06/17	07/06/17	1	0.4	0.4	0.4
BBC_STP2	08/12/18	09/19/18	4	0.3	0.4	0.4
BBC_STP2	07/27/19	08/15/19	2	0.3	0.5	0.4

Public comment submitted by Buzzards Bay Coalition as part of the 2018/20 IR

B. Salters Pond Fails to Meet State Water Quality Standards and must be Listed as Impaired for Total Nitrogen on the 2018/2020 List of Category 5 Waters.

The Coalition requests that Salters Pond be listed as impaired for total nitrogen. The Coalition's water quality monitoring data support its listing.

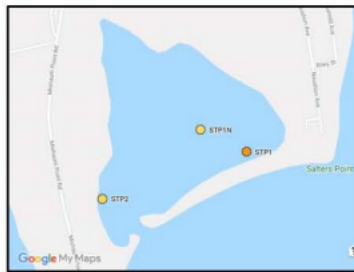


Figure 5. Salters Pond Site Map

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Salters Pond demonstrates water quality decline related to excess nutrients. As described above, excessive levels of nitrogen are common in southeastern Massachusetts and result in ecosystem degradation with impacts including loss of eelgrass beds, algae blooms, fish kills and reductions in important marine life. In order to target areas that are suffering from excessive nitrogen levels, like Salters Pond, and remove as much nitrogen as possible from these areas, it is imperative that MassDEP list Salters Pond as impaired for total nitrogen.

1. Salters Pond Dissolved Oxygen

The Coalition submits multiple years of oxygen data taken from three locations illustrating water quality impairment due to nutrient over-enrichment. The Coalition's dissolved oxygen data show that Salters Pond consistently falls below the numeric criteria of 6 mg/L as designated in 314 CMR 4.05(4)(a)(1)(a) and warrants listing on the 303(d) list.

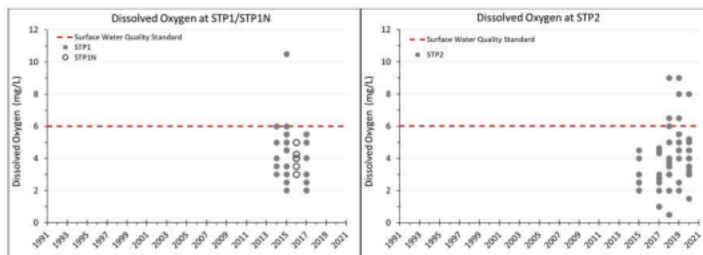


Figure 6. Dissolved Oxygen Concentrations in Salters Pond

The dissolved oxygen concentrations in Figure 6 clearly shows a majority of samples below the numeric dissolved oxygen criteria established in the Massachusetts Surface Water Quality Standards.

2. Salters Pond Chlorophyll Data

The Coalition's chlorophyll data show that Salters Pond does not possess the excellent aesthetic values required of SA waters pursuant to 314 CMR 4.05(4)(a), "These waters shall have excellent aesthetic value" and warrants listing on the 303(d) list.

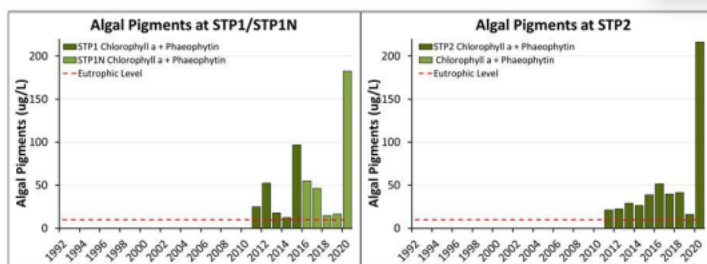


Figure 7. Phytoplankton Pigments in Salters Pond

The data presented in Figure 7 show high levels of phytoplankton pigments at sampling stations STP1, STP1N, and STP2, including levels over 150 µg/L in 2020. The high concentrations of chlorophyll indicate degraded water clarity in violation of the excellent aesthetic value required in Massachusetts Surface Water Quality Standards.

3. Salters Pond Total Nitrogen Data

The Coalition's total nitrogen data for Salters Pond suggests that the nitrogen levels promote the algae growth and the low dissolved oxygen numbers shown above. Figure 8 exhibits total nitrogen concentrations in Salters Pond that are regularly above 2 mg/L and sometimes above 4 mg/L. The incidences of high total nitrogen concentration and high chlorophyll indicate that Salters Pond fails to attain state water quality standards and must also be listed on the 303(d) list as impaired for total nitrogen.

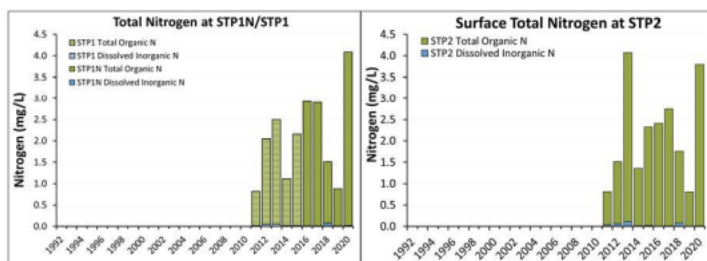


Figure 8. Total Nitrogen in Salters Pond

The above data clearly indicate that Salters Pond is suffering from eutrophication due to excess nutrients and must be listed on the Commonwealth of Massachusetts' 303(d) list of Category 5 waters requiring a TMDL for total nitrogen. Dissolved oxygen data at sampling sites STP1 and STP2 are in clear violation of surface water quality standards, falling below

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dissolved oxygen levels of 6 mg/L. Salters Pond also has elevated chlorophyll levels that degrade water clarity and aesthetic value and very high total nitrogen concentrations.

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_STP1	07/27/15	08/25/15	0.2	3	0.008	0.017	0.011
BBC_STP1	08/03/17	08/03/17	0.2	1	0.012	0.012	0.012
BBC_STP1N	07/05/16	08/01/16	0.2	3	0.008	0.008	0.008
BBC_STP1N	07/06/17	08/17/17	0.2	3	0.006	0.010	0.007
BBC_STP1N	07/10/18	08/21/18	0.2	3	0.009	0.16	0.07
BBC_STP1N	07/11/19	08/15/19	0.2	4	0.004	0.006	0.005

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_STP2	07/13/15	08/25/15	0.2	4	0.008	0.030	0.016
BBC_STP2	07/05/16	08/01/16	0.2	3	0.007	0.008	0.007
BBC_STP2	07/06/17	08/17/17	0.2	4	0.005	0.016	0.010
BBC_STP2	08/07/18	08/21/18	0.2	2	0.005	0.108	0.057
BBC_STP2	07/11/19	08/15/19	0.2	4	0.004	0.004	0.004

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Salters Point Pond (MA95-106); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Insufficient Information	YES
2022 Use Attainment Summary	
Salters Point Pond (MA95-106): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0738 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0738 sq mi (91%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area \geq 0.0001 sq mi.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB10.2	Salters Point Outfall Closure Area	Prohibited	0.07385	91.4%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Salters Point Pond (MA95-106) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Salters Point Pond (MA95-106) so it is Not Assessed.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Salters Point Pond (MA95-106): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0738 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Salters Point Pond (MA95-106) so it is Not Assessed.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Salters Point Pond (MA95-106): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0738 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Sampson Pond (MA95125)

Location:	Carver.
AU Type:	FRESHWATER LAKE
AU Size:	295 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Asian Clam*)		Added
5	5	(Fanwort*)		Added
5	5	(Non-Native Aquatic Plants*)		Unchanged
5	5	(Non-Native Fish/Shellfish/Zooplankton*)		Removed
5	5	(Swollen Bladderwort*)		Added
5	5	DDT in Fish Tissue		Unchanged
5	5	Mercury in Fish Tissue		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Asian Clam*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
(Fanwort*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
(Non-Native Aquatic Plants*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
(Swollen Bladderwort*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
DDT in Fish Tissue	Source Unknown (N)		X			
Mercury in Fish Tissue	Source Unknown (N)		X			

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Non-Native Fish/Shellfish/Zooplankton	Clarification of listing cause	The generic Non-Native Fish/Shellfish/Zooplankton impairment code is being removed since the species-specific Asian Clam impairment is being added.

Recommendations

2022 Recommendations
ALU: Conduct a survey of Sampson Pond (MA95125) and collect voucher specimens of live <i>Corbicula fluminea</i> (Asian clam) to confirm the appropriateness of the listing (confirmation of any non-native species should be made by a qualified state agency/taxonomist).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, fanwort (<i>Cabomba caroliniana</i>), in Sampson Pond (MA95125) during a July 1995 synoptic survey. DEP staff also subsequently reported infestations of variable milfoil (<i>Myriophyllum heterophyllum</i>) in 2005 and swollen bladderwort (<i>Utricularia inflata</i>) in 2017. MassDCR Lakes and Ponds staff reported the presence of the non-native Asian clam (<i>Corbicula fluminea</i>) in the pond in 2007; the presence of live specimens should be confirmed by DEP staff.</p> <p>The Aquatic Life Use will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment (for <i>Myriophyllum heterophyllum</i>) is being carried forward and Swollen Bladderwort (<i>U. inflata</i>) and Fanwort (<i>C. caroliniana</i>) impairments are being added. The generic Non-Native Fish/Shellfish/Zooplankton impairment code is being removed since a species-specific impairment (Asian Clam) is being added in its place.</p>	

Biological Monitoring Information

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995) (MassDEP Undated1) (MassDCR 2008)

Summary Statement	Assessment Recommendation
As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, fanwort (<i>Cabomba caroliniana</i>), in Sampson Pond during a July 1995 synoptic survey. DEP staff also subsequently reported infestations of variable milfoil (<i>Myriophyllum heterophyllum</i>) in 2005 and swollen bladderwort (<i>Utricularia inflata</i>) in 2017. MassDCR Lakes and Ponds staff reported the presence of the non-native Asian clam (<i>Corbicula fluminea</i>) in the pond in 2007; the presence of live specimens should be confirmed by DEP staff and an Alert should be issued in the interim.	Conduct a survey of Sampson Pond and collect voucher specimens of live <i>Corbicula fluminea</i> (Asian clam).

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>The Fish Consumption Use for Sampson Pond AU (MA95125) will continue to be assessed as Not Supporting with the Mercury and DDT in Fish Tissue impairments being carried forward. MA DPH advises <i>Children under 12, pregnant women, nursing mothers, women of child-bearing age not to eat any Brown Bullhead or White Perch from the pond, while the general public should limit Brown Bullhead and White Perch to 2 meals/month</i> (MassDFG 2020).</p>	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
<p>No data are available to assess the status of the Aesthetic Use for Sampson Pond (MA95125) so it is Not Assessed. The Alert previously identified for Algal Blooms (noted by MassDEP staff during a 7 September 2005 survey) (MassDEP Undated10) is being carried forward.</p>	

Primary Contact Recreation

2022 Use Attainment		Alert
Not Assessed		YES
2022 Use Attainment Summary		
No <i>Enterococcus</i> or <i>E. coli</i> bacteria data are available to assess the status of the Primary Contact Recreation Use for Sampson Pond (MA95125) so it is Not Assessed. The Alert previously identified for Algal Blooms is being carried forward.		

Secondary Contact Recreation

2022 Use Attainment		Alert
Not Assessed		YES
2022 Use Attainment Summary		
No <i>E. coli</i> bacteria data are available to assess the status of the Secondary Contact Recreation Use for Sampson Pond (MA95125) so it is Not Assessed. The Alert previously identified for Algal Blooms is being carried forward.		

Sand Pond (MA95127)

Location:	Wareham.
AU Type:	FRESHWATER LAKE
AU Size:	14 ACRES
Classification/Qualifier:	A: PWS, ORW

No usable data were available for Sand Pond (MA95127) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Sandy Pond (MA95128)

Location:	Wareham.
AU Type:	FRESHWATER LAKE
AU Size:	15 ACRES
Classification/Qualifier:	B

No usable data were available for Sandy Pond (MA95128) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Shell Point Bay (MA95-94)

Location:	Wareham.
AU Type:	ESTUARY
AU Size:	0.18 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	5	Fecal Coliform		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			

Recommendations

2022 Recommendations
ALU: Continue to conduct sampling in Shell Point Bay (MA95-94) to better evaluate nutrient-related stress (include total nitrogen sampling at least three times per season at mid-ebb tide as well as primary producer biological screening and DO), to better evaluate the nature and extent of possible nutrient enrichment impairments.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	
<p>The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at two locations in Shell Point Bay, Wareham (MA95-94) in the summers of 2015-2019: from a dock off Gladstone Ave (BBC_SB2X) and near the outer edge of the AU (BBC_SB1). Monitoring was conducted in the surface waters at both locations, as well as deeper in the water column at BBC_SB2X (i.e., at depths ranging 0.6-0.8m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature (at both locations) was 28°C (n=97). The minimum dissolved oxygen (DO) (only monitored at BBC_SB2X) was 3.5mg/L (n=98), <6.0mg/L 51 times (52% of all measurements, at the surface and average depth of 0.7m) and <5.0mg/L 19 times (~19% of all measurements). These low DO concentrations, however, are considered to most likely to be a result of natural conditions consistent with those of a salt marsh tidal creek. Total nitrogen concentrations ranged from 0.31 to 0.50mg/L at BBC_SB1 during ebb tides in July and/or August (n=7) although no seasonal averages were calculated with <3 samples per year. The maximum chlorophyll <i>a</i> was 9.38µg/L (n=11), >5µg/L four times. Secchi disk depths ranged from 1.0-2.5m (n=11) and ammonia-nitrogen concentrations ranged from 0.004 to 0.02mg/L (n=12), though TUs could not be calculated (lack of quality assured pH and salinity data).</p> <p>The Aquatic Life Use for Shell Point Bay (MA95-94) is assessed as Fully Supporting based on the generally good water quality as documented by the BBC staff/volunteers in 2015-2019. An Alert is being identified since total nitrogen concentrations appear to be increasing so recommendations will also be made for additional monitoring to evaluate nutrient-related stress.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_SB1	Buzzards Bay Coalition	Water Quality	Onset Bay	Shell Point Bay, Wareham	41.738635	-70.669118
BBC_SB2X	Buzzards Bay Coalition	Water Quality	Onset Bay	Shell Point Bay, Wareham	41.742042	-70.672333

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_SB2X	06/10/16	09/21/16	0.2	9	4.7	5.6	78	22	0
BBC_SB2X	06/17/16	09/21/16	0.7	8	4.2	5.8	63	25	0
BBC_SB2X	06/21/17	09/20/17	0.2	9	4.7	5.9	44	11	0
BBC_SB2X	06/13/17	09/20/17	0.7	9	5.0	6.2	22	0	0
BBC_SB2X	06/05/18	09/19/18	0.2	21	4.0	5.3	76	38	0
BBC_SB2X	06/05/18	09/19/18	0.7	17	4.0	5.4	71	18	0
BBC_SB2X	06/14/19	09/24/19	0.2	8	3.5	7.1	13	13	13
BBC_SB2X	06/10/19	09/24/19	0.6	17	4.5	7.0	18	6	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_SB1	07/27/15	08/10/15	0.2	2	2	26.0	23.5	0
BBC_SB1	07/05/16	08/15/16	0.2	3	3	24.0	22.7	0
BBC_SB1	07/06/17	08/17/17	0.2	2	2	22.0	21.5	0
BBC_SB1	07/10/18	08/21/18	0.2	3	3	27.0	24.7	0
BBC_SB1	07/25/19	08/15/19	0.2	2	2	23.0	22.3	0
BBC_SB2X	06/10/16	09/21/16	0.2	9	8	25.5	22.2	0
BBC_SB2X	06/17/16	09/21/16	0.8	8	7	24.2	22.3	0
BBC_SB2X	06/21/17	09/20/17	0.2	9	8	24.1	21.4	0
BBC_SB2X	06/13/17	09/20/17	0.7	9	8	23.2	21.4	0
BBC_SB2X	06/05/18	09/19/18	0.2	19	18	27.8	22.6	0
BBC_SB2X	05/30/18	09/19/18	0.7	16	14	28.0	23.2	0
BBC_SB2X	06/14/19	09/24/19	0.2	8	7	26.0	21.7	0
BBC_SB2X	06/10/19	09/24/19	0.6	17	15	27.0	22.7	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_SB1	2015	0.2	2	0.31	0.31	0.31	2	3.59	6.03	4.81	1	0
BBC_SB1	2016	0.2	1	0.33	0.33	0.33	3	1.86	3.33	2.54	3	0
BBC_SB1	2017	0.2	1	0.49	0.49	0.49	2	3.99	4.17	4.08	2	0
BBC_SB1	2018	0.2	2	0.39	0.43	0.41	3	4.20	8.42	5.98	1	0
BBC_SB1	2019	0.2	1	0.50	0.50	0.50	1	9.38	9.38	9.38	0	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_SB1	07/05/16	08/15/16	3	1.6	1.9	1.8
BBC_SB1	07/10/18	08/21/18	3	1.3	1.8	1.6
BBC_SB1	07/25/19	07/25/19	1	1.6	1.6	1.6
BBC_SB2X	06/11/18	08/21/18	4	1.0	2.5	1.7

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_SB1	07/27/15	08/10/15	0.2	2	0.006	0.010	0.008
BBC_SB1	07/05/16	08/15/16	0.2	3	0.006	0.008	0.007
BBC_SB1	07/06/17	08/17/17	0.2	2	0.004	0.010	0.007
BBC_SB1	07/10/18	08/21/18	0.2	3	0.005	0.024	0.012
BBC_SB1	07/25/19	08/15/19	0.2	2	0.004	0.008	0.006

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Shell Point Bay (MA95-94); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Shell Point Bay (MA95-94): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.166 sq mi (93%). The approved shellfish growing area represents 0.0001 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications, a fecal coliform impairment is being added.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB40.0	Onset Bay	Approved	0.00008	0.0%
BB41.0	Sunset Cove	Conditionally Approved	0.12927	72.6%
BB41.2	Sunset Cove	Conditionally Approved	0.03665	20.6%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Shell Point Bay (MA95-94) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There is one beach in Shell Point Bay, Wareham (MA95-94) known as Shell Point (ID 3192). This beach was rarely or not posted for swimming between 2014 and 2019.</p> <p>The Primary Contact Recreational Use for Shell Point Bay (MA95-94) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the Shell Point beach between 2014 and 2019.</p>	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
3192	Shell Point/Wareham	41.74132	-70.66580	41.73844	-70.66390	3%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Shell Point Bay (MA95-94): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.166 sq mi (93%). The approved shellfish growing area represents 0.0001 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO

2022 Use Attainment Summary

There is one beach in Shell Point Bay, Wareham (MA95-94) known as Shell Point (ID 3192). This beach was rarely or not posted for swimming between 2014 and 2019.

The Secondary Contact Recreational Use for Shell Point Bay (MA95-94) is assessed as Fully Supporting, since there were very few, if any, swimming advisory postings at the Shell Point beach between 2014 and 2019.

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary

Shell Point Bay (MA95-94): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.166 sq mi (93%). The approved shellfish growing area represents 0.0001 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Shingle Island River (MA95-12)

Location:	Outlet of small unnamed pond northeast of Flag Swamp Road, Dartmouth to mouth at inlet Noquochoke Lake (north basin), Dartmouth.
AU Type:	RIVER
AU Size:	5 MILES
Classification/Qualifier:	A: PWS, ORW (Tributary)

No usable data were available for Shingle Island River (MA95-12) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Enterococcus		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Enterococcus	Source Unknown (N)				X	

Sippican Harbor (MA95-100)

Location:	Blanketship Cove and Planting Island Cove, in the northeast corner of Sippican Harbor, Marion.
AU Type:	ESTUARY
AU Size:	0.29 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	2	None		Unchanged

Recommendations

2022 Recommendations
ALU: Conduct DO monitoring (ideally continuous) throughout the water column in the open waters (away from shore), to better evaluate the nature and extent of possible low DO impairments for this Sippican Harbor AU (MA95-100).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	
<p>The MassDEP Eelgrass Mapping Project documented an increase in eelgrass bed habitat in this Sippican Harbor AU (MA95-100) between 1995 and 2017 (0.05 miles² to 0.09 miles², respectively). The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at four locations in Sippican Harbor, Marion (MA95-100) in the summers of 2015-2019. At the south-east end of the AU (locally known as Blankenship Cove): BBC_PL2X (~100ft from the southern bank) and BBC_PL2N (~mid-channel); then at the northwest end of the AU (locally known as Planting Island Cove): BBC_BLK1X (from a dock) and BBC_BLK1N (~mid-channel). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at the nearshore stations (i.e., at depths ranging 1.4-1.7m at BBC_BLK1X and 0.8-0.9m at BBC_PL2X) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 29°C (n=244); the minimum dissolved oxygen (DO) was 3.5mg/L (at BBC_BLK1X in 2019) (n=240) and measured <6.0mg/L 67 times (~28% of the measurements overall); though was <5.0mg/L only eight times (~3.0% of the measurements overall). Excursions from the 6.0mg/L criteria were spread fairly consistently over the years at BBC_BLK1X and PL2X (throughout the water column), with >10% of the measurements being <6.0mg/L in most of the sample years. The severe excursions from the criteria (i.e., <5.0mg/L) occurred intermittently at BBC_BLK1X and PL2X and rarely for >10% of the measurements annually. Nutrient sampling efforts (ebb tides in July and August) documented a maximum of 0.47mg/L at BBC_PL2N in 2018 (n=6 and always <3 samples per year). The maximum chlorophyll <i>a</i> was 8.75µg/L (n=39), on 11 occasions being >5µg/L. Secchi disk depth ranged from 0.9-2.1m (n=74) and ammonia-nitrogen concentrations ranged from 0.004 to 0.01mg/L (n=39), though TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for this Sippican Harbor AU (MA95-100) is assessed as Fully Supporting, based on the water quality data collected by the BBC staff/volunteers in 2015-2019 which are indicative of generally good conditions and the documented increase in eelgrass bed habitat documented by the MassDEP between 1995 and 2017. An Alert is being identified for DO due to the intermittently low concentrations documented by BBC, at nearshore stations in both Blankenship Cove and Planting Island Cove. An Alert is also being identified for Nutrient Enrichment Biological Indicators, due to impairments of this nature documented in the two adjacent Sippican Harbor AU's. Recommendations will be made to collect additional DO data further from shore, in this Sippican Harbor AU.</p>	

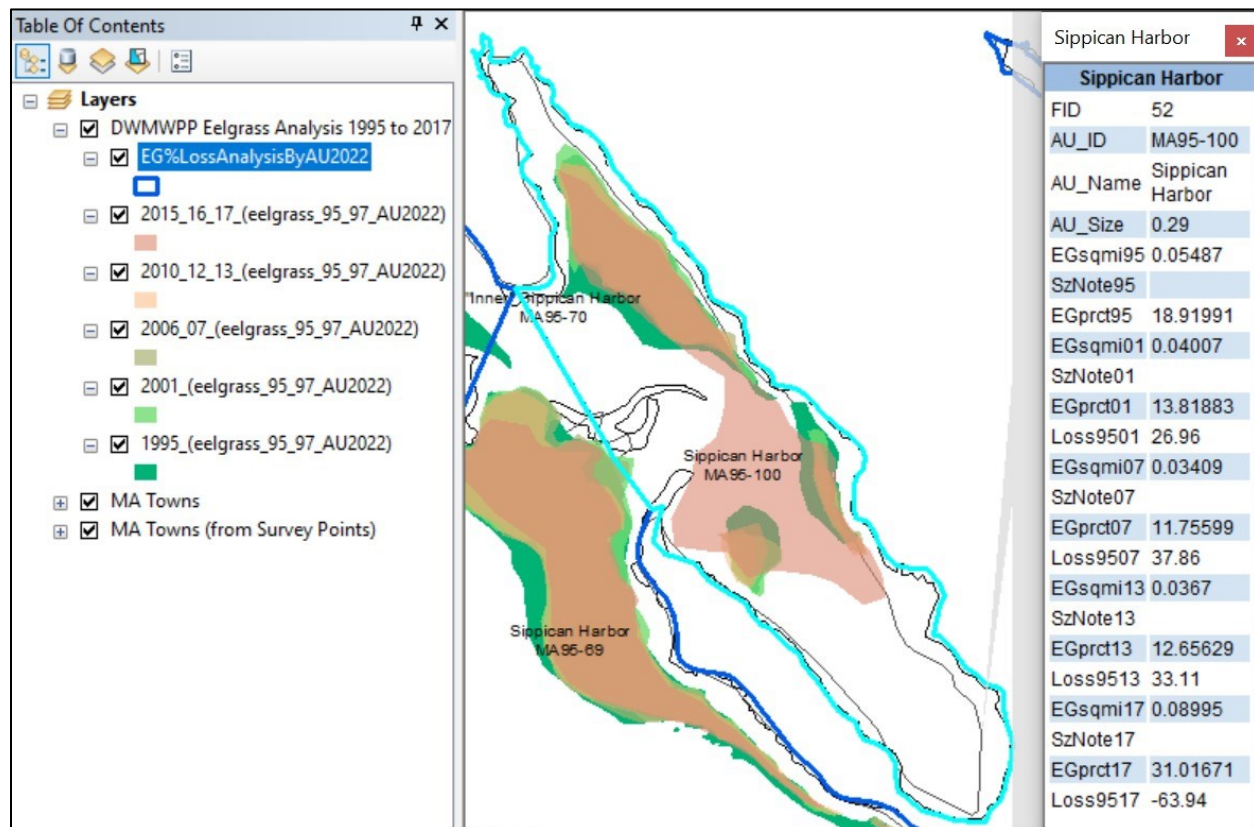
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_BLK1N	Buzzards Bay Coalition	Water Quality	Sippican Harbor	Blankenship Cove, Marion	41.701122	-70.742137
BBC_BLK1X	Buzzards Bay Coalition	Water Quality	Sippican Harbor	Blankenship Cove, Marion	41.701889	-70.740431
BBC_PL2N	Buzzards Bay Coalition	Water Quality	Sippican Harbor	Planting Island Cove, Marion	41.693975	-70.736364
BBC_PL2X	Buzzards Bay Coalition	Water Quality	Sippican Harbor	Planting Island Cove, Marion	41.693629	-70.737065

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Sippican Harbor MA95-100 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an increase in eelgrass bed habitat in the Sippican Harbor between 1995 and 2017 (0.05 miles² to 0.09 miles², respectively).

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_BLK1N	07/05/16	07/05/16	0.2	1	6.7	6.7	0	0	0
BBC_BLK1X	06/04/15	09/22/15	0.2	17	5.2	6.4	35	0	0
BBC_BLK1X	06/04/15	09/22/15	1.7	17	5.0	6.1	41	0	0
BBC_BLK1X	06/22/16	09/19/16	0.2	11	5.2	6.1	36	0	0
BBC_BLK1X	06/22/16	09/19/16	1.5	11	5.1	5.9	64	0	0
BBC_BLK1X	06/16/17	09/19/17	0.2	13	5.9	6.7	8	0	0
BBC_BLK1X	06/16/17	09/19/17	1.6	13	5.6	6.4	8	0	0
BBC_BLK1X	06/06/18	09/19/18	0.2	10	5.5	6.3	50	0	0
BBC_BLK1X	06/06/18	09/19/18	1.5	10	5.5	6.2	40	0	0
BBC_BLK1X	06/14/19	09/24/19	0.2	12	4.0	7.0	8	8	0
BBC_BLK1X	06/14/19	09/24/19	1.7	12	3.5	6.2	25	17	8
BBC_PL2N	07/05/16	07/05/16	0.2	1	6.4	6.4	0	0	0
BBC_PL2X	05/28/15	09/23/15	0.8	22	4.0	6.2	36	14	0
BBC_PL2X	06/10/16	06/10/16	0.2	1	6.5	6.5	0	0	0
BBC_PL2X	05/31/16	09/24/16	0.9	22	4.5	6.4	5	5	0
BBC_PL2X	05/31/17	09/21/17	0.9	22	5.0	6.1	41	0	0
BBC_PL2X	05/30/18	09/19/18	0.8	23	4.5	6.6	17	4	0
BBC_PL2X	05/31/19	09/23/19	0.9	22	5.0	6.4	23	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_BLK1N	07/13/15	08/25/15	0.2	4	4	26.0	24.6	0
BBC_BLK1N	07/05/16	08/15/16	0.2	4	4	29.0	26.5	0
BBC_BLK1N	07/06/17	08/17/17	0.2	4	4	27.0	24.5	0
BBC_BLK1N	07/24/18	08/21/18	0.2	2	2	26.0	24.5	0
BBC_BLK1N	07/11/19	08/15/19	0.2	4	4	26.0	25.8	0
BBC_BLK1X	06/04/15	09/22/15	0.2	17	15	26.3	23.0	0
BBC_BLK1X	06/04/15	09/22/15	1.7	17	15	26.3	22.9	0
BBC_BLK1X	06/22/16	09/19/16	0.2	11	10	26.6	23.8	0
BBC_BLK1X	06/22/16	09/19/16	1.4	11	10	26.6	23.7	0
BBC_BLK1X	06/16/17	09/19/17	0.2	13	12	24.5	22.1	0
BBC_BLK1X	06/16/17	09/19/17	1.6	13	12	24.4	22.0	0
BBC_BLK1X	06/06/18	09/19/18	0.2	10	9	26.8	22.8	0
BBC_BLK1X	06/06/18	09/19/18	1.5	10	9	27.0	22.8	0
BBC_BLK1X	06/14/19	09/24/19	0.2	12	10	27.0	24.3	0
BBC_BLK1X	06/14/19	09/24/19	1.7	12	10	27.0	24.3	0
BBC_PL2N	07/13/15	08/25/15	0.2	4	4	26.0	24.4	0
BBC_PL2N	07/05/16	08/15/16	0.2	4	4	29.0	26.8	0
BBC_PL2N	07/06/17	08/17/17	0.2	4	4	27.0	24.8	0
BBC_PL2N	07/24/18	08/21/18	0.2	2	2	26.0	24.5	0
BBC_PL2N	07/11/19	08/15/19	0.2	4	4	26.0	25.5	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_PL2X	05/28/15	09/23/15	0.8	22	19	25.0	22.1	0
BBC_PL2X	06/10/16	06/10/16	0.2	1	1	17.5	17.5	0
BBC_PL2X	05/31/16	09/24/16	1.0	22	18	26.0	22.2	0
BBC_PL2X	05/31/17	09/21/17	0.9	22	19	24.8	21.5	0
BBC_PL2X	06/05/18	09/19/18	0.8	21	20	26.5	23.2	0
BBC_PL2X	05/31/19	09/23/19	0.9	22	19	25.8	22.3	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_BLK1N	2015	0.2	--	--	--	--	4	2.62	6.30	4.31	2	0
BBC_BLK1N	2016	0.2	--	--	--	--	4	1.01	3.72	2.76	4	0
BBC_BLK1N	2017	0.2	--	--	--	--	4	3.46	7.10	4.79	3	0
BBC_BLK1N	2018	0.2	2	0.34	0.41	0.38	3	3.18	4.88	3.88	3	0
BBC_BLK1N	2019	0.2	--	--	--	--	4	2.85	6.66	4.28	3	0
BBC_PL2N	2015	0.2	1	0.34	0.34	0.34	4	5.35	8.75	6.65	0	0
BBC_PL2N	2016	0.2	1	0.38	0.38	0.38	4	2.32	3.59	3.15	4	0
BBC_PL2N	2017	0.2	--	--	--	--	4	3.56	5.97	4.34	3	0
BBC_PL2N	2018	0.2	2	0.33	0.47	0.40	4	1.46	4.98	2.89	4	0
BBC_PL2N	2019	0.2	--	--	--	--	4	4.47	6.72	5.45	2	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_BLK1N	07/27/15	08/25/15	3	1.5	2.0	1.8
BBC_BLK1N	07/05/16	08/15/16	4	1.3	1.8	1.5
BBC_BLK1N	07/06/17	08/03/17	3	1.6	1.7	1.6
BBC_BLK1N	07/24/18	08/21/18	2	1.7	1.8	1.8
BBC_BLK1N	07/11/19	08/15/19	4	1.3	1.9	1.6
BBC_BLK1X	06/04/15	09/17/15	10	1.4	2.1	1.8
BBC_BLK1X	08/30/16	08/30/16	1	1.9	1.9	1.9
BBC_BLK1X	06/16/17	09/19/17	7	1.2	2.1	1.7
BBC_BLK1X	06/06/18	09/19/18	5	1.4	1.6	1.5
BBC_BLK1X	06/14/19	09/19/19	6	1.3	2.0	1.7
BBC_PL2N	07/13/15	08/25/15	3	0.9	1.3	1.1
BBC_PL2N	07/05/16	08/01/16	2	1.1	1.6	1.4
BBC_PL2N	07/06/17	07/06/17	1	1.3	1.3	1.3
BBC_PL2X	05/28/15	09/14/15	5	1.1	1.4	1.2

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_PL2X	06/04/16	07/20/16	4	1.0	1.8	1.3
BBC_PL2X	06/07/17	08/22/17	6	1.1	1.7	1.3
BBC_PL2X	06/11/18	09/19/18	3	1.2	1.6	1.3
BBC_PL2X	05/31/19	08/28/19	5	1.1	1.8	1.4

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_BLK1N	07/13/15	08/25/15	0.2	4	0.006	0.010	0.009
BBC_BLK1N	07/05/16	08/15/16	0.2	4	0.004	0.008	0.006
BBC_BLK1N	07/06/17	08/17/17	0.2	4	0.004	0.008	0.005
BBC_BLK1N	07/24/18	08/21/18	0.2	3	0.004	0.006	0.004
BBC_BLK1N	07/11/19	08/15/19	0.2	4	0.004	0.004	0.004
BBC_PL2N	07/13/15	08/25/15	0.2	4	0.007	0.012	0.009
BBC_PL2N	07/05/16	08/15/16	0.2	4	0.005	0.008	0.007
BBC_PL2N	07/06/17	08/17/17	0.2	4	0.004	0.011	0.007
BBC_PL2N	07/10/18	08/21/18	0.2	4	0.004	0.008	0.006
BBC_PL2N	07/11/19	08/15/19	0.2	4	0.004	0.004	0.004

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Sippican Harbor AU (MA95-100); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
Sippican Harbor (MA95-100): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2694 sq mi (92%). The approved shellfish growing area represents 0.2694 sq mi (92%). The Shellfish Harvesting Use is assessed as fully supporting because the growing area (normalized to the AU area) is classified as 100% approved.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB32.0	Sippican Outer Harbor	Approved	0.26935	92.4%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Sippican Harbor AU (MA95-100) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2694 sq mi (92%). The approved shellfish growing area represents 0.2694 sq mi (92%).</p> <p>The Primary Contact Recreational Use for this Sippican Harbor AU (MA95-100) is assessed as Fully Supporting because the shellfish growing area (normalized to the AU area) is classified as 100% approved.</p>	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Sippican Harbor (MA95-100): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2694 sq mi (92%). The approved shellfish growing area represents 0.2694 sq mi (92%). The Primary Contact Recreational Use is assessed as fully supporting because the growing area (normalized to the AU area) is classified as 100% approved, unless other data are available that contradict this use attainment decision.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2694 sq mi (92%). The approved shellfish growing area represents 0.2694 sq mi (92%).</p> <p>The Secondary Contact Recreational Use for this Sippican Harbor AU (MA95-100) is assessed as Fully Supporting because the shellfish growing area (normalized to the AU area) is classified as 100% approved.</p>	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Sippican Harbor (MA95-100): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2694 sq mi (92%). The approved shellfish growing area represents 0.2694 sq mi (92%). The Secondary Contact Recreational use is assessed as fully supporting because the growing area (normalized to the AU area) is classified as 100% approved, unless other data are available that contradict this use attainment decision.

Sippican Harbor (MA95-69)

Location:	The waters between a line demarcating the mouth of the harbor (from Converse Point to Butler Point, Marion) and a line from Allens Point, Marion around the southeastern tip of Ram Island, then westerly from the southern tip of Ram Island, to the point of land south of Nyes Wharf, Marion excluding Blanketship Cove and Planting Island Cove (formerly part of 2006 segment: Sippican Harbor MA95-08).
AU Type:	ESTUARY
AU Size:	1.94 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	5	Estuarine Bioassessments		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					

Recommendations

2022 Recommendations
ALU: Conduct DO monitoring (ideally continuous) throughout the water column in the open waters (away from shore), to better evaluate the nature and extent of possible low DO impairments for this Sippican Harbor AU (MA95-69).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an ~22% loss of eelgrass bed habitat in this Sippican Harbor AU (MA95-69) between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at two locations in Sippican Harbor, Marion (MA95-69), in the summers of 2015-2019 as follows: at the north/inner end of the AU at BBC_SH3X (from west bank shoreline at the Silvershell Beach boat ramp) & a little further downstream in the middle of the channel at BBC_SH3N (~mid-channel). Monitoring was conducted in the surface waters at both locations, as well as deeper in the water column at the shoreline station BBC_SH3X (i.e., at depths ranging 0.4-0.6m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 29°C (n=99); the minimum dissolved oxygen (DO) was 3.5mg/L (n=95) and while it frequently measured below the 6.0mg/L DO criterion in the surface waters at the shoreline station (BBC_SHX), it usually always measured >6.0mg/L in the mid-channel at BBC_SH3N (though only surface measurements were taken at that location). Overall, DO measured <6.0mg/L 17 times (~18% of the measurements); the frequent severe excursions from the criterion (i.e., <5.0mg/L) occurred during a limited time frame (summer 2018) at BBC_SH3X, though it should be noted that these data were flagged as “unusual” by the BBC, but not censored. Nutrient sampling efforts (ebb tides; in July and August 2018 & 2019; January-September in 2016 & 2017 and June-September in 2015) documented a maximum total nitrogen concentration of 0.35mg/L (n=2 once each in 2016 & 2018). The maximum chlorophyll *a* was 7.9µg/L (n=33), on eleven occasions being >5µg/L and Secchi disk depths ranged from 0.4-4.2m (n=33). Ammonia-nitrogen concentrations were generally low, (range 0.004 to 0.01mg/L (n=33)), though TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for this Sippican Harbor AU (MA95-69) is assessed as Not Supporting, based on the loss of eelgrass bed habitat documented by the MassDEP Eelgrass Mapping Project between 1995 and 2017; so an Estuarine Bioassessment impairment is being added, with the prior Alert issued in 2000 (MassDEP 2003) due to concerns regarding declining eelgrass bed habitat removed. A new Alert is being identified for Dissolved Oxygen due to the intermittently low concentrations documented by the BBC staff/volunteers, at a nearshore station off Silvershell Beach boat ramp. Recommendations will be made to collect additional DO data further from shore, throughout this Sippican Harbor AU.

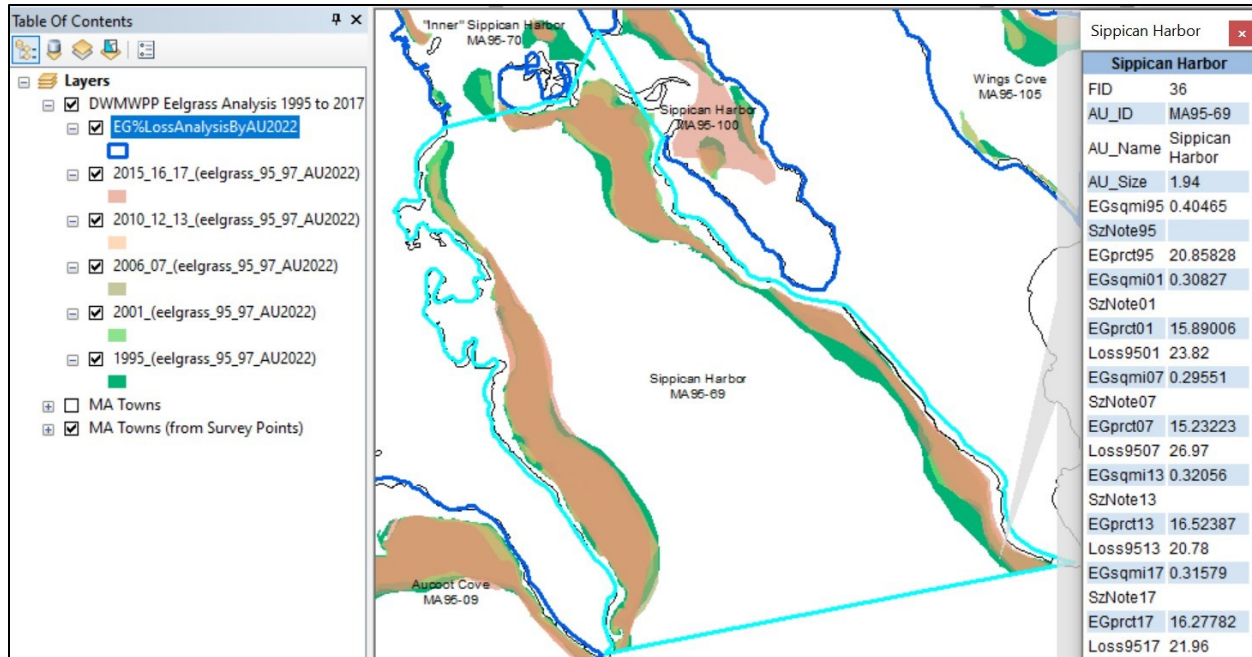
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_SH3N	Buzzards Bay Coalition	Water Quality	Sippican Harbor	Sippican Harbor Outer, Marion	41.689943	-70.7475
BBC_SH3X	Buzzards Bay Coalition	Water Quality	Sippican Harbor	Sippican Harbor Outer, Marion	41.69334	-70.755867

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Sippican Harbor MA95-69 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~22% loss of eelgrass bed habitat in Sippican Harbor between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_SH3N	06/16/15	09/24/15	0.2	4	6.3	6.9	0	0	0
BBC_SH3N	06/01/16	09/26/16	0.2	5	5.7	7.1	20	0	0
BBC_SH3N	01/09/17	09/18/17	0.2	4	6.7	9.7	0	0	0
BBC_SH3X	05/28/15	09/22/15	0.1	14	4.7	6.5	21	7	0
BBC_SH3X	05/31/16	09/19/16	0.1	16	4.7	6.4	31	6	0
BBC_SH3X	06/06/16	08/02/16	0.5	3	5.1	6.2	33	0	0
BBC_SH3X	06/22/17	09/19/17	0.1	14	5.3	6.6	21	0	0
BBC_SH3X	06/12/17	09/05/17	0.4	2	6.6	7.3	0	0	0
BBC_SH3X	07/14/18	08/11/18	0.1	6	3.5	5.1	67	67	33
BBC_SH3X	06/11/18	07/09/18	0.6	6	6.0	6.7	0	0	0
BBC_SH3X	05/31/19	09/21/19	0.2	21	6.0	7.5	0	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_SH3N	06/16/15	09/24/15	0.2	8	7	26.0	23.8	0
BBC_SH3N	01/06/16	09/26/16	0.2	10	7	28.0	23.9	0
BBC_SH3N	01/09/17	09/18/17	0.2	8	5	26.0	22.1	0
BBC_SH3N	07/24/18	08/21/18	0.2	2	2	26.0	24.5	0
BBC_SH3N	07/11/19	08/15/19	0.2	4	4	26.0	25.5	0
BBC_SH3X	05/28/15	09/22/15	0.1	14	11	26.0	23.9	0
BBC_SH3X	05/31/16	09/19/16	0.1	16	14	25.5	22.3	0
BBC_SH3X	06/06/16	08/02/16	0.5	3	3	25.0	23.2	0
BBC_SH3X	06/22/17	09/19/17	0.1	14	13	24.0	21.7	0
BBC_SH3X	06/12/17	09/05/17	0.4	2	2	20.3	20.1	0
BBC_SH3X	05/30/18	08/11/18	0.2	8	7	25.5	24.2	0
BBC_SH3X	06/11/18	07/09/18	0.6	6	6	21.8	19.2	0
BBC_SH3X	05/31/19	09/21/19	0.2	21	18	25.9	21.7	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_SH3N	2015	0.2	--	--	--	--	8	2.54	7.67	5.65	2	0
BBC_SH3N	2016	0.2	1	0.35	0.35	0.35	10	1.15	4.30	2.54	10	0
BBC_SH3N	2017	0.2	--	--	--	--	8	1.27	6.17	3.77	6	0
BBC_SH3N	2018	0.2	1	0.32	0.32	0.32	3	3.74	5.20	4.57	2	0
BBC_SH3N	2019	0.2	--	--	--	--	4	4.49	7.94	5.66	2	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_SH3N	06/16/15	09/24/15	8	0.4	3.4	1.8
BBC_SH3N	01/06/16	09/26/16	10	1.5	4.2	2.4
BBC_SH3N	01/09/17	09/18/17	8	1.4	3.5	2.0
BBC_SH3N	07/24/18	08/21/18	3	1.4	1.6	1.5
BBC_SH3N	07/11/19	08/15/19	4	1.4	1.9	1.6

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_SH3N	06/16/15	09/24/15	0.2	8	0.004	0.011	0.007
BBC_SH3N	01/06/16	09/26/16	0.2	10	0.004	0.010	0.006
BBC_SH3N	01/09/17	09/18/17	0.2	8	0.004	0.008	0.004
BBC_SH3N	07/24/18	08/21/18	0.2	3	0.004	0.004	0.004
BBC_SH3N	07/11/19	08/15/19	0.2	4	0.004	0.004	0.004

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Sippican Harbor (MA95-69); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	
Sippican Harbor (MA95-69): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.8876 sq mi (97%). The approved shellfish growing area represents 1.8862 sq mi (97%). The Shellfish Harvesting Use is assessed as fully supporting because the growing area (normalized to the AU area) is classified as 100% approved. Alert due to prohibited area ≥ 0.0001 sq mi.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB32.0	Sippican Outer Harbor	Approved	1.88615	97.1%
BB32.4	Jobs Cove	Prohibited	0.00140	0.1%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Sippican Harbor AU (MA95-69) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	

There are three Marion beaches in this Sippican Harbor AU (MA95-69); the names and ID codes for the beaches from inner to outer are as follows: Silver Shell (ID 2949), Planting Island (ID 2948) and Converse Point (ID 2945). These beaches were usually never (or only rarely) posted for swimming between 2014 and 2019, with the greatest number of posts occurring at Planting Island Beach in 2017 (6% of the bathing season posted). In addition, the total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.8876 sq mi (97%). The approved shellfish growing area represents 1.8862 sq mi (97%).

The Primary Contact Recreational Use for this Sippican Harbor AU (MA95-69) is assessed as Fully Supporting, since there were very few if any swimming advisory postings at the Silver Shell, Planting Island, and Converse Point Beaches between 2014 & 2019 and the shellfish growing area (normalized to the AU area) is classified as 100% approved.

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2945	Converse Point/Marion	41.67309	-70.74480	41.67280	-70.74460	0%	0%	1%	0%	0%	0%	0
2948	Planting Island/Marion	41.68924	-70.73330	41.68853	-70.73000	0%	0%	0%	6%	0%	0%	0
2949	Silver Shell/Marion	41.69564	-70.75590	41.69346	-70.75610	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Sippican Harbor (MA95-69): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.8876 sq mi (97%). The approved shellfish growing area represents 1.8862 sq mi (97%). The Primary Contact Recreational Use is assessed as fully supporting because the growing area (normalized to the AU area) is classified as 100% approved, unless other data are available that contradict this use attainment decision.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There are three Marion beaches in this Sippican Harbor AU (MA95-69); the names and ID codes for the beaches from inner to outer are as follows: Silver Shell (ID 2949), Planting Island (ID 2948) and Converse Point (ID 2945). These beaches were usually never (or only rarely) posted for swimming between 2014 and 2019, with the greatest number of posts occurring at Planting Island Beach in 2017 (6% of the bathing season posted). In addition, the total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.8876 sq mi (97%). The approved shellfish growing area represents 1.8862 sq mi (97%).</p> <p>The Secondary Contact Recreational Use for this Sippican Harbor AU (MA95-69) is assessed as Fully Supporting, since there were very few if any swimming advisory postings at the Silver Shell, Planting Island, and Converse Point Beaches between 2014 and 2019 and the shellfish growing area (normalized to the AU area) is classified as 100% approved.</p>	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary

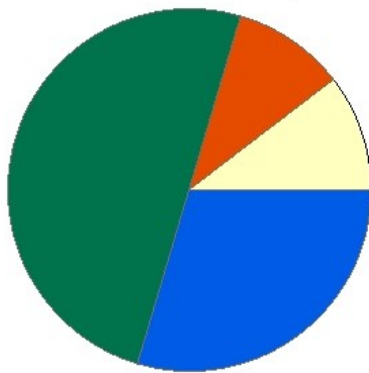
Sippican Harbor (MA95-69): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.8876 sq mi (97%). The approved shellfish growing area represents 1.8862 sq mi (97%). The Secondary Contact Recreational use is assessed as fully supporting because the growing area (normalized to the AU area) is classified as 100% approved, unless other data are available that contradict this use attainment decision.

Sippican River (MA95-06)

Location:	Headwaters, outlet Leonards Pond, Rochester to County Road, Marion/Wareham.
AU Type:	RIVER
AU Size:	3 MILES
Classification/Qualifier:	B: WWF, HQW

Sippican River - MA95-06

Watershed Area: 28.11 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	28.11	13.55	10.76	5.48
Agriculture	10.4%	11.3%	19.8%	20%
Developed	10.1%	9.7%	8.2%	7.2%
Natural	49.9%	51%	42.8%	43.8%
Wetland	29.6%	28%	29.2%	29%
Impervious Cover	3.7%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Chlorophyll-a		Unchanged
5	5	Dissolved Oxygen		Unchanged
5	5	Enterococcus		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Chlorophyll-a	Dam or Impoundment (N)	X				
Chlorophyll-a	Source Unknown (N)	X				
Dissolved Oxygen	Source Unknown (N)	X				
Enterococcus	Source Unknown (N)				X	

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
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Not Supporting	NO
2022 Use Attainment Summary	
<p>DMF biologists note two potential barriers providing adequate passage to diadromous fish throughout this Sippican River AU (MA95-06). The targeted species at both locations were river herring and American eel, with a population score of "2". From upstream to downstream: the Leonards Pond Dam (NATID# MA00369) (with existing fishway) relevant to the passage of fish between the Sippican River and the upstream Leonards Pond (MA95080), was given a passage score of "2", on a 0-10 scale (minor obstruction). DMF noted that construction of the fishway was completed in 2011. In the middle of the AU, the Hathaway Pond Dam (NATID# MA00368) (with existing "steepass fishway" installed at this location in 2013), just upstream of the Marion Town line, was given a passage score of "3" (minor obstruction). The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at two locations in this Sippican River AU in the summers of 2015-2019; at the upstream end at Bates Road in Rochester (BBC_HP1) and just downstream of Hathaway Pond in Rochester (BBC_HP3). Monitoring was conducted in the surface waters, as well as deeper in the water column (depths ranging from 0.3 to 0.6m) and was usually conducted weekly in the summer months (between 6 & 9am). The maximum temperature was 28.0°C (n=129). The minimum dissolved oxygen (DO) was 3.0mg/L (n=108): <5.0mg/L twice between May and July (when anadromous fish early life stages are potentially present) and <4.0mg/L four times overall. Total phosphorus sampling (n=40, maximum 0.032mg/L) in July and August documented seasonal average total phosphorus concentrations at both locations between 0.012-0.023mg/L. The maximum chlorophyll <i>a</i> was 33.36µg/L (n=40); >16µg/L four times (three times at BBC_HP1 in 2017, 2018, and 2019 and once at BBC_HP3 in 2015). Secchi disk depths ranged from 0.5 to 0.7m (n=5). Ammonia-nitrogen concentrations were generally low (range 0.07 to 0.072mg/L, n=41), though TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for this Sippican River AU (MA95-06) will continue to be assessed as Not Supporting based on the water quality data collected by BBC staff/volunteers in 2015-2019. The Chlorophyll <i>a</i> and Dissolved Oxygen impairments are both being carried forward.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_HP1	Buzzards Bay Coalition	Water Quality	Sippican River	Sippican River, Rochester	41.747371	-70.803695
BBC_HP3	Buzzards Bay Coalition	Water Quality	Hathaway Pond	Hathaway Pond, Rochester	41.733924	-70.794137

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
<p>DMF biologists note two potential barriers providing adequate passage to diadromous fish throughout the Sippican River AU. The targeted species at both locations were river herring and American eel, with a population score of "2". From upstream to downstream: The Leonards Pond Dam (NATID# MA00369) (with existing fishway) relevant to the passage of fish between Sippican river and the upstream Leonards Pond (MA95080), was given a passage score of "2", on a 0-10 scale (minor obstruction). DMF noted that construction of the fishway was completed in 2011. In the middle of the AU, the Hathaway Pond Dam (NATID# MA00368) (with existing fishway), just upstream of the Marion Town line, was given a passage score of "3" (minor obstruction). DMF noted that the "steepass fishway" was installed at this location in 2013.</p>

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Freshwater Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Average Sample depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
BBC_HP1	06/09/15	09/24/15	0.1	10	6.5	7.4	0	0	0
BBC_HP1	06/12/16	09/01/16	0.1	9	6.0	7.1	0	0	0
BBC_HP1	06/01/17	08/25/17	0.2	14	5.0	6.6	0	0	0
BBC_HP1	06/05/17	06/05/17	0.3	1	8.0	8.0	0	0	0
BBC_HP1	05/30/18	08/21/18	0.2	16	5.5	7.3	0	0	0
BBC_HP1	08/12/18	08/15/18	0.5	2	6.0	6.5	0	0	0
BBC_HP1	06/05/19	09/18/19	0.2	16	5.5	6.8	0	0	0
BBC_HP1	06/14/19	06/14/19	0.6	1	7.4	7.4	0	0	0
BBC_HP3	06/09/15	09/23/15	0.2	9	4.2	6.6	1	0	0
BBC_HP3	06/09/15	09/23/15	0.5	9	4.2	6.4	1	0	0
BBC_HP3	09/01/16	09/01/16	0.2	1	4.0	4.0	1	0	0
BBC_HP3	06/20/18	08/21/18	0.2	3	3.0	6.0	1	0	1
BBC_HP3	06/20/18	06/27/18	0.6	2	7.2	7.2	0	0	0
BBC_HP3	06/05/19	09/18/19	0.2	8	3.7	5.3	4	1	1
BBC_HP3	06/05/19	09/18/19	0.6	7	3.6	5.3	3	1	2

Buzzards Bay Coalition Discrete Freshwater Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
BBC_HP1	06/09/15	09/24/15	0.1	10	9	24.6	22.7	7	7	0	0
BBC_HP1	06/12/16	09/01/16	0.1	13	13	26.0	22.7	11	6	0	0
BBC_HP1	06/01/17	08/25/17	0.1	18	18	25.4	22.2	16	9	0	0
BBC_HP1	06/05/17	06/05/17	0.3	1	1	15.5	15.5	0	0	0	0
BBC_HP1	05/30/18	08/21/18	0.2	19	18	27.0	23.5	15	13	0	0
BBC_HP1	08/12/18	08/15/18	0.5	2	2	27.0	25.5	2	2	0	0
BBC_HP1	06/05/19	09/18/19	0.2	19	18	24.0	21.7	15	8	0	0
BBC_HP1	06/14/19	06/14/19	0.6	1	1	18.3	18.3	0	0	0	0
BBC_HP3	06/09/15	09/23/15	0.2	9	8	25.3	23.3	7	6	0	0
BBC_HP3	06/09/15	09/23/15	0.6	9	8	25.3	23.3	7	6	0	0
BBC_HP3	07/05/16	09/01/16	0.2	5	5	27.0	24.6	5	5	0	0
BBC_HP3	07/06/17	08/17/17	0.2	4	4	24.8	23.6	4	3	0	0
BBC_HP3	06/20/18	08/21/18	0.2	6	6	28.0	24.4	6	5	0	0
BBC_HP3	06/20/18	06/27/18	0.6	2	2	23.5	22.7	2	1	0	0
BBC_HP3	06/05/19	09/18/19	0.2	11	10	23.5	21.5	8	6	0	0
BBC_HP3	06/05/19	09/18/19	0.6	7	6	23.4	20.9	4	3	0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Freshwater Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	DO Sat Max (%)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count >16µg/L
BBC_HP1	2015	0.2	4	0.008	0.024	0.018	--	4	4.29	10.23	7.65	0
BBC_HP1	2016	0.2	4	0.009	0.015	0.013	--	4	6.24	15.55	11.50	0
BBC_HP1	2017	0.1	4	0.008	0.015	0.012	--	4	5.37	27.60	11.34	1
BBC_HP1	2018	0.2	4	0.009	0.016	0.013	--	4	1.37	18.59	7.36	1
BBC_HP1	2019	0.2	4	0.019	0.027	0.022	--	4	1.86	33.36	12.82	1
BBC_HP3	2015	0.2	4	0.015	0.032	0.023	--	4	4.53	17.08	9.38	1
BBC_HP3	2016	0.2	4	0.015	0.015	0.015	--	4	3.76	10.11	7.19	0
BBC_HP3	2017	0.2	4	0.009	0.015	0.013	--	4	5.96	11.77	8.08	0
BBC_HP3	2018	0.2	4	0.015	0.019	0.016	--	4	2.87	12.51	7.14	0
BBC_HP3	2019	0.2	4	0.013	0.022	0.018	--	4	1.52	7.16	3.75	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_HP1	08/15/18	08/15/18	1	0.5	0.5	0.5
BBC_HP1	07/26/19	07/26/19	1	0.5	0.5	0.5
BBC_HP3	08/15/16	08/15/16	1	0.5	0.5	0.5
BBC_HP3	08/21/18	08/21/18	1	0.6	0.6	0.6
BBC_HP3	08/08/19	08/08/19	1	0.7	0.7	0.7

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_HP1	07/13/15	08/25/15	0.2	4	0.020	0.036	0.029
BBC_HP1	07/05/16	08/15/16	0.2	4	0.021	0.041	0.029
BBC_HP1	07/06/17	08/17/17	0.1	4	0.012	0.038	0.028
BBC_HP1	07/10/18	08/21/18	0.2	5	0.038	0.060	0.052
BBC_HP1	07/11/19	08/15/19	0.2	4	0.024	0.069	0.044
BBC_HP3	07/13/15	08/25/15	0.2	4	0.013	0.029	0.022
BBC_HP3	07/05/16	08/15/16	0.2	4	0.008	0.010	0.010
BBC_HP3	07/06/17	08/17/17	0.2	4	0.021	0.045	0.028
BBC_HP3	07/10/18	08/21/18	0.2	4	0.007	0.072	0.032
BBC_HP3	07/11/19	08/15/19	0.2	4	0.022	0.044	0.036

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Sippican River AU (MA95-06); therefore the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Sippican River AU (MA95-06) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No <i>Enterococcus</i> or <i>E. coli</i> bacteria data are available to assess the status of the Primary Contact Recreation Use for this Sippican River AU (MA95-06) so it will continue to be assessed as Not Supporting with the <i>Enterococcus</i> impairment being carried forward.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E. coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for this Sippican River AU (MA95-06) so it is Not Assessed.	

Sippican River (MA95-07)

Location:	County Road, Marion/Wareham to confluence with Weweantic River, Marion/Wareham.
AU Type:	ESTUARY
AU Size:	0.08 SQUARE MILES
Classification/Qualifier:	SA: SFO, HQW

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aquatic Life Use for this Sippican River AU (MA95-07) so it is Not Assessed.	

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Sippican River AU (MA95-07); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Sippican River (MA95-07): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0719 sq mi (86%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB35.4	Sippican River	Prohibited	0.05831	70.1%
BB35.5	Middle River	Conditionally Approved	0.01364	16.4%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Sippican River AU (MA95-07) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for this Sippican River AU (MA95-07) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Sippican River (MA95-07): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0719 sq mi (86%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for this Sippican River AU (MA95-07) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Sippican River (MA95-07): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0719 sq mi (86%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Slocums River (MA95-34)

Location:	Rock O'Dundee Road (confluence with Paskemanset River), Dartmouth to mouth at Buzzards Bay, Dartmouth.
AU Type:	ESTUARY
AU Size:	0.66 SQUARE MILES
Classification/Qualifier:	SA: SFO, HQW

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	4a	Dissolved Oxygen	R1_MA_2020_01	Changed
5	4a	Estuarine Bioassessments	R1_MA_2020_01	Changed
5	4a	Fecal Coliform	36172	Unchanged
5	4a	Nitrogen, Total	R1_MA_2020_01	Changed
5	4a	Nutrient/Eutrophication Biological Indicators	R1_MA_2020_01	Changed

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Source Unknown (N)	X					
Estuarine Bioassessments	Agriculture (Y)	X					
Estuarine Bioassessments	Impervious Surface/Parking Lot Runoff (Y)	X					
Estuarine Bioassessments	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Estuarine Bioassessments	Residential Districts (Y)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Agriculture (Y)	X					
Nitrogen, Total	Impervious Surface/Parking Lot Runoff (Y)	X					
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nitrogen, Total	Residential Districts (Y)	X					
Nutrient/Eutrophication Biological Indicators	Agriculture (Y)	X					
Nutrient/Eutrophication Biological Indicators	Impervious Surface/Parking Lot Runoff (Y)	X					
Nutrient/Eutrophication Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nutrient/Eutrophication Biological Indicators	Residential Districts (Y)	X					

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Estuarine Bioassessments	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Nitrogen TMDL for Slocums & Little Rivers Embayment System (Report CN 315.1, approved 2019-10-10, ATTAINS Action ID: R1_MA_2020_01)
Nitrogen, Total	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Nitrogen TMDL for Slocums & Little Rivers Embayment System (Report CN 315.1, approved 2019-10-10, ATTAINS Action ID: R1_MA_2020_01)
Nutrient/Eutrophication Biological Indicators	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Nitrogen TMDL for Slocums & Little Rivers Embayment System (Report CN 315.1, approved 2019-10-10, ATTAINS Action ID: R1_MA_2020_01)

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in the Slocums River, Dartmouth (MA95-34) in the summers of 2015-2019, from upstream to downstream as follows: close to the upstream end of the AU at BBC_SR5, roughly halfway down the AU (on the east bank) at BBC_SR1, and closer to the downstream end of the AU (on the east bank) at BBC_SR4. All three of the sample stations were close to shore (from boat ramps or docks). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column (at average depths ranging from 0.3 to 0.9m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 31.0°C (n=381), just once (in 2016) >29.4°C at BBC_SR5. The minimum Dissolved Oxygen (DO) was 1.7mg/L (n=343); <6.0mg/L 146 times (43% of the measurements overall) and <5.0mg/L 69 times (20% of the measurements overall) with the lowest DOs documented in the upstream half of the AU (i.e., at BBC_SR5 & SR1) at depths ranging 0.3-0.6m. Total nitrogen sampling (n=63, maximum 3.08mg/L at BBC_SR1 in 2019) during ebb tides in June through September documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.4-1.6mg/L, all exceeding the MEP Benthic Habitat Nitrogen Concentration Threshold of 0.36mg/L (MassDEP 2019). The maximum chlorophyll <i>a</i> was 60.3µg/L (n=91) (documented at BBC_SR1 in 2019); >5µg/L 54 times and >10µg/L between one and five times a year (36 total at BBC_SR5 and SR1). Secchi disk depths in the Slocums River measured usually weekly in the summers 2015-2019 at BBC_SR5, though a little more intermittently at BBC_SR1 and SR4 ranged from 0.2 to 1.7m (n=51). Ammonia-nitrogen concentrations ranged from 0.004 to 0.18mg/L (n=91), though TUs for ammonia-nitrogen could not be calculated due to a lack of quality assured pH and salinity data.</p> <p>The Aquatic Life Use for Slocums River (MA95-34) will continue to be assessed as Not Supporting, based on the water quality data collected by the BBC staff/volunteers in 2015-2019 which are indicative of poor conditions (especially in the upstream half of the AU); with the Estuarine Bioassessments, Total Nitrogen and Nutrient/Eutrophication Biological Indicators impairments being carried forward. A new impairment for Dissolved Oxygen is being added due to the low concentrations documented by the BBC throughout the AU.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_SR1	Buzzards Bay Coalition	Water Quality	Slocums River	Slocums River Inner, Dartmouth	41.548499	-70.998304
BBC_SR4	Buzzards Bay Coalition	Water Quality	Slocums River	Slocums River Outer, Dartmouth	41.538091	-70.977211

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_SR5	Buzzards Bay Coalition	Water Quality	Slocums River	Slocums River Head, Dartmouth	41.568437	-71.00488

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_SR1	06/05/15	09/15/15	0.2	9	4.0	7.1	11	11	0
BBC_SR1	07/02/15	08/13/15	0.4	2	6.0	7.0	0	0	0
BBC_SR1	05/31/16	09/23/16	0.1	11	3.5	5.7	73	36	9
BBC_SR1	06/06/16	09/17/16	0.3	9	4.5	5.2	67	44	0
BBC_SR1	05/31/17	08/11/17	0.1	9	5.0	6.5	33	0	0
BBC_SR1	06/05/17	09/21/17	0.2	11	4.5	5.7	55	9	0
BBC_SR1	06/05/18	09/15/18	0.1	8	2.5	4.4	75	63	50
BBC_SR1	05/30/18	09/20/18	0.4	12	2.5	3.9	92	83	50
BBC_SR1	06/04/19	09/08/19	0.1	11	4.5	6.1	27	9	0
BBC_SR1	05/30/19	09/18/19	0.3	12	4.5	5.7	50	17	0
BBC_SR4	06/03/15	08/29/15	0.2	6	7.0	7.5	0	0	0
BBC_SR4	05/28/15	08/29/15	0.8	17	5.0	6.9	12	0	0
BBC_SR4	06/06/16	09/23/16	0.2	12	5.5	6.1	33	0	0
BBC_SR4	05/31/16	09/20/16	0.8	19	5.0	6.2	32	0	0
BBC_SR4	06/05/17	09/19/17	0.2	9	5.0	5.7	56	0	0
BBC_SR4	05/31/17	09/19/17	0.7	21	3.5	6.0	33	5	5
BBC_SR4	05/30/18	09/15/18	0.2	11	4.5	6.0	36	9	0
BBC_SR4	05/30/18	09/19/18	0.6	17	4.5	6.0	41	12	0
BBC_SR4	06/14/19	09/27/19	0.2	8	5.5	6.8	13	0	0
BBC_SR4	05/30/19	09/27/19	0.8	22	4.5	6.4	23	5	0
BBC_SR5	06/04/15	09/23/15	0.1	9	1.7	7.0	22	22	22
BBC_SR5	05/29/15	09/14/15	0.6	13	3.0	5.4	62	54	8
BBC_SR5	06/11/16	09/20/16	0.1	7	4.5	6.1	57	14	0
BBC_SR5	06/06/16	09/17/16	0.4	13	3.5	5.3	69	38	8
BBC_SR5	06/12/17	08/24/17	0.1	7	2.5	5.4	43	43	29
BBC_SR5	06/07/17	09/20/17	0.4	14	3.5	5.4	57	36	7
BBC_SR5	06/05/18	09/15/18	0.2	5	5.5	7.3	40	0	0
BBC_SR5	05/29/18	09/19/18	0.5	18	3.5	4.9	78	50	22
BBC_SR5	06/10/19	09/04/19	0.2	8	7.5	8.1	0	0	0
BBC_SR5	05/30/19	09/23/19	0.5	13	3.5	6.4	38	31	8

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_SR1	06/05/15	09/24/15	0.2	17	16	27.5	22.3	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_SR1	07/02/15	08/13/15	0.4	2	2	24.5	23.3	0
BBC_SR1	01/06/16	09/26/16	0.1	22	16	28.0	22.0	0
BBC_SR1	06/06/16	09/17/16	0.3	9	8	26.0	22.6	0
BBC_SR1	03/08/17	09/19/17	0.1	20	17	23.5	19.8	0
BBC_SR1	06/05/17	09/21/17	0.2	9	7	23.6	19.7	0
BBC_SR1	06/05/18	09/15/18	0.1	12	12	27.0	22.0	0
BBC_SR1	05/30/18	09/20/18	0.5	11	9	26.0	22.8	0
BBC_SR1	06/04/19	09/08/19	0.1	15	15	23.6	20.6	0
BBC_SR1	05/30/19	09/18/19	0.3	11	9	26.0	21.5	0
BBC_SR4	06/03/15	09/24/15	0.2	14	13	26.5	22.5	0
BBC_SR4	05/28/15	08/29/15	0.9	17	16	27.0	22.7	0
BBC_SR4	01/06/16	09/26/16	0.2	22	17	26.0	22.5	0
BBC_SR4	05/31/16	09/20/16	0.8	19	16	24.0	20.9	0
BBC_SR4	03/08/17	09/19/17	0.1	18	15	24.0	19.4	0
BBC_SR4	05/31/17	09/19/17	0.7	21	19	22.0	19.2	0
BBC_SR4	05/30/18	09/15/18	0.1	15	14	26.0	22.7	0
BBC_SR4	05/30/18	09/19/18	0.6	17	15	26.0	22.1	0
BBC_SR4	06/14/19	09/27/19	0.2	12	11	23.5	20.6	0
BBC_SR4	05/30/19	09/27/19	0.8	22	19	25.0	20.3	0
BBC_SR5	06/04/15	09/23/15	0.1	13	11	26.8	22.5	0
BBC_SR5	05/29/15	09/14/15	0.6	13	12	28.0	25.3	0
BBC_SR5	06/11/16	09/20/16	0.1	11	10	31.0	22.5	1
BBC_SR5	06/06/16	09/17/16	0.4	13	12	30.0	24.1	1
BBC_SR5	06/12/17	08/24/17	0.1	11	11	25.0	20.9	0
BBC_SR5	06/07/17	09/20/17	0.4	14	13	28.0	21.4	0
BBC_SR5	06/05/18	09/15/18	0.2	9	9	27.0	21.4	0
BBC_SR5	05/29/18	09/19/18	0.4	17	15	28.7	25.3	0
BBC_SR5	06/10/19	09/04/19	0.2	12	12	23.2	20.0	0
BBC_SR5	05/30/19	09/23/19	0.5	13	10	26.7	21.6	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_SR1	2015	0.1	7	0.33	0.95	0.65	8	4.37	40.45	13.61	1	5
BBC_SR1	2016	0.2	2	0.42	0.57	0.50	10	1.57	31.61	10.83	3	5
BBC_SR1	2017	0.2	6	0.57	1.24	0.84	9	3.36	17.12	9.91	1	4
BBC_SR1	2018	0.1	1	0.96	0.96	0.96	4	5.77	16.82	10.50	0	2
BBC_SR1	2019	0.2	4	0.53	3.08	1.39	4	8.36	60.30	29.68	0	3
BBC_SR4	2015	0.1	5	0.31	0.57	0.40	8	2.74	5.69	4.47	7	0
BBC_SR4	2016	0.2	4	0.31	0.52	0.41	10	0.91	4.42	2.49	10	0
BBC_SR4	2017	0.1	7	0.32	0.92	0.56	10	1.73	12.47	4.71	7	1

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_SR4	2018	0.2	4	0.33	0.54	0.40	4	2.64	3.91	3.43	4	0
BBC_SR4	2019	0.2	3	0.28	0.99	0.52	4	4.72	7.48	5.77	2	0
BBC_SR5	2015	0.2	4	0.84	2.12	1.25	4	7.88	26.08	16.28	0	3
BBC_SR5	2016	0.2	4	0.89	1.24	1.07	4	12.61	25.26	17.73	0	4
BBC_SR5	2017	0.2	4	1.07	1.29	1.18	4	14.60	33.44	23.82	0	4
BBC_SR5	2018	0.2	4	0.93	1.37	1.19	4	17.20	35.92	27.73	0	4
BBC_SR5	2019	0.2	4	1.11	2.51	1.60	4	0.90	30.61	10.58	2	1

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_SR1	09/05/17	09/05/17	1	0.2	0.2	0.2
BBC_SR1	06/27/18	07/27/18	2	0.5	0.7	0.6
BBC_SR4	06/30/15	07/31/15	3	1.3	1.6	1.4
BBC_SR4	07/05/16	08/19/16	3	1.0	1.5	1.3
BBC_SR4	08/21/17	09/19/17	2	1.5	1.6	1.6
BBC_SR4	08/11/18	09/11/18	2	0.9	0.9	0.9
BBC_SR4	08/01/19	09/27/19	2	1.2	1.7	1.4
BBC_SR5	06/16/15	09/14/15	9	0.3	0.7	0.6
BBC_SR5	06/06/16	09/17/16	7	0.4	0.8	0.6
BBC_SR5	06/07/17	09/06/17	4	0.5	0.8	0.7
BBC_SR5	05/29/18	08/27/18	5	0.5	0.7	0.6
BBC_SR5	05/30/19	08/17/19	11	0.3	0.6	0.4

Toxics and other pollutants (metals, ammonia, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_SR1	06/16/15	09/24/15	0.1	8	0.010	0.111	0.048
BBC_SR1	01/06/16	09/26/16	0.2	10	0.004	0.051	0.016
BBC_SR1	03/08/17	09/19/17	0.2	9	0.004	0.180	0.048
BBC_SR1	07/10/18	08/21/18	0.1	4	0.004	0.052	0.017
BBC_SR1	07/11/19	08/15/19	0.2	4	0.006	0.067	0.022
BBC_SR4	06/16/15	09/24/15	0.1	8	0.009	0.039	0.024
BBC_SR4	01/06/16	09/26/16	0.2	10	0.004	0.049	0.020
BBC_SR4	01/09/17	09/19/17	0.1	10	0.004	0.058	0.021
BBC_SR4	07/10/18	08/21/18	0.2	4	0.005	0.015	0.009
BBC_SR4	07/11/19	08/15/19	0.2	4	0.005	0.072	0.022
BBC_SR5	07/13/15	08/25/15	0.2	4	0.015	0.093	0.060
BBC_SR5	07/05/16	08/15/16	0.2	4	0.009	0.027	0.016

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_SR5	07/06/17	08/17/17	0.2	4	0.008	0.125	0.044
BBC_SR5	07/10/18	08/21/18	0.2	4	0.006	0.025	0.015
BBC_SR5	07/11/19	08/15/19	0.2	4	0.022	0.085	0.059

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Slocums River (MA95-34); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
Slocums River (MA95-34): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.6053 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.6053 sq mi (91%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB8.0	Slocum's River	Prohibited	0.60526	91.1%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	YES
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Slocums River (MA95-34) so it is Not Assessed. The Alert previously identified for excessive algal growth is being carried forward.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> data are available to assess the Primary Contact Recreational Use for Slocums River (MA95-34) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Slocums River (MA95-34): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.6053 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> data are available to assess the Secondary Contact Recreational Use for Slocums River (MA95-34) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Slocums River (MA95-34): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.6053 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Snell Creek (MA95-44)

Location:	Headwaters west of Main Street, Westport to Drift Road, Westport.
AU Type:	RIVER
AU Size:	1.5 MILES
Classification/Qualifier:	B

No usable data were available for Snell Creek (MA95-44) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Enterococcus	36170	Unchanged
4a	4a	Escherichia Coli (E. Coli)	36170	Unchanged
4a	4a	Fecal Coliform	36170	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Enterococcus	Source Unknown (N)				X	X
Escherichia Coli (E. Coli)	Source Unknown (N)				X	
Fecal Coliform	Source Unknown (N)				X	

Snell Creek (MA95-45)

Location:	Drift Road, Westport to 'Marcus' Bridge', Westport (prior to 2004 this segment included estuarine portion).
AU Type:	RIVER
AU Size:	0.4 MILES
Classification/Qualifier:	B

No usable data were available for Snell Creek (MA95-45) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Enterococcus	36170	Unchanged
4a	4a	Escherichia Coli (E. Coli)	36170	Unchanged
4a	4a	Fecal Coliform	36170	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Enterococcus	Source Unknown (N)				X	X
Escherichia Coli (E. Coli)	Source Unknown (N)				X	
Fecal Coliform	Animal Feeding Operations (NPS) (Y)				X	X
Fecal Coliform	Dairies (Y)				X	X
Fecal Coliform	Grazing in Riparian or Shoreline Zones (Y)				X	X
Fecal Coliform	Source Unknown (N)				X	X

Snell Creek (MA95-59)

Location:	'Marcus' Bridge', Westport to confluence with East Branch Westport River, Westport (formerly part of 2002 segment: Snell Creek MA95-45).
AU Type:	ESTUARY
AU Size:	0.01 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Animal Feeding Operations (NPS) (Y)			X		X	X
Fecal Coliform	Dairies (Y)			X		X	X
Fecal Coliform	Grazing in Riparian or Shoreline Zones (Y)			X		X	X

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aquatic Life Use for this Snell Creek AU (MA95-59) so it is Not Assessed.	

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Snell Creek AU (MA95-59); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Snell Creek (MA95-59): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0057 sq mi (74%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB4.15	Lakes Island	Conditionally Approved	0.00215	27.7%
BB4.26	Snell Creek	Prohibited	0.00357	46.0%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Snell Creek AU (MA95-59) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the status of the Primary Contact Recreation Use for this Snell Creek AU (MA95-59), so it will continue to be assessed as Not Supporting with the Fecal Coliform impairment being carried forward.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Snell Creek (MA95-59): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0057 sq mi (74%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the status of the Secondary Contact Recreation Use for this Snell Creek AU (MA95-59), so it will continue to be assessed as Not Supporting with the Fecal Coliform impairment being carried forward.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Snell Creek (MA95-59): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0057 sq mi (74%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Snipatuit Pond (MA95137)

Location:	Rochester.
AU Type:	FRESHWATER LAKE
AU Size:	711 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	(Fanwort*)		Added
4a	4a	Mercury in Fish Tissue	33880	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fanwort*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
Mercury in Fish Tissue	Atmospheric Deposition - Toxics (Y)		X			
Mercury in Fish Tissue	Source Unknown (N)		X			

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>DMF biologists note one structure at the downstream end of Snipatuit Pond, affecting the passage of diadromous fish between the pond and the downstream AU (Mattapoissett River MA95-36). The Snipatuit Pond Dam (with existing fishway), was given a passage score of "0" on a 0-10 scale (with 10 equating to no possible passage), indicating that the dam is not an obstruction to the passage of the targeted species, river herring and American eel. The population score in this area was noted to be "5". During the 2005 field season, MassDEP staff reported an infestation of the non-native aquatic macrophyte, fanwort (<i>Cabomba caroliniana</i>), in Snipatuit Pond (Station ID W1405).</p> <p>The Aquatic Life Use for Snipatuit Pond (MA95137) is assessed as Not Supporting due to the infestation of fanwort (<i>Cabomba caroliniana</i>) documented by MassDEP staff in 2005. An impairment for the non-native aquatic macrophyte species (Fanwort) impairment is being added.</p>	

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary

DMF biologists note one structure at the downstream end of Snipatuit Pond, assisting the passage of diadromous fish between the pond and the downstream AU (Mattapoissett River MA95-36). The Snipatuit Pond Dam (with existing fishway), was given a passage score of "0" on a 0-10 scale (with 10 equating to no possible passage), indicating that the dam is not an obstruction to the passage of the targeted species, river herring and American eel. The population score in this area was noted to be "5".

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP Undated1)

Summary Statement

During the 2005 field season, MassDEP staff reported an infestation of the non-native aquatic macrophyte, fanwort (*Cabomba caroliniana*), in Snipatuit Pond.

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
The Fish Consumption Use for this Snipatuit Pond AU (MA95137) will continue to be assessed as Not Supporting with the Mercury in Fish Tissue impairment being carried forward. MA DPH advises <i>"Children under 12, pregnant women, nursing mothers, women of child-bearing age not to eat any Black Crappie or Largemouth Bass from the pond, while the general public should limit Black Crappie and Largemouth Bass to 2 meals/month"</i> (MassDPH 2021).	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No new data are available to assess the status of the Aesthetic Use for Snipatuit Pond (MA95137) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for Snipatuit Pond (MA95137) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Snipatuit Pond (MA95137) so it is Not Assessed.	

South Meadow Brook Pond (MA95139)

Location:	Carver.
AU Type:	FRESHWATER LAKE
AU Size:	25 ACRES
Classification/Qualifier:	B

No usable data were available for South Meadow Brook Pond (MA95139) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

South Meadow Pond (MA95140)

Location:	Carver.
AU Type:	FRESHWATER LAKE
AU Size:	22 ACRES
Classification/Qualifier:	B

No usable data were available for South Meadow Pond (MA95140) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Southwest Atwood Bog Pond (MA95141)

Location:	Carver.
AU Type:	FRESHWATER LAKE
AU Size:	12 ACRES
Classification/Qualifier:	B

No usable data were available for Southwest Atwood Bog Pond (MA95141) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Spectacle Pond (MA95142)

Location:	Wareham.
AU Type:	FRESHWATER LAKE
AU Size:	41 ACRES
Classification/Qualifier:	B

No usable data were available for Spectacle Pond (MA95142) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Squeteague Harbor (MA95-55)

Location:	Waters landward of the confluence with Megansett Harbor, Bourne/Falmouth.
AU Type:	ESTUARY
AU Size:	0.15 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Fecal Coliform		Added
5	5	Nutrient/Eutrophication Biological Indicators	R1_MA_2020_07	Changed

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			
Nutrient/Eutrophication Biological Indicators	Impervious Surface/Parking Lot Runoff (Y)	X					
Nutrient/Eutrophication Biological Indicators	Landfills (Y)	X					
Nutrient/Eutrophication Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nutrient/Eutrophication Biological Indicators	Residential Districts (Y)	X					

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Nutrient/Eutrophication Biological Indicators	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Nitrogen TMDL Report for Megansett-Squeteague Harbor Estuarine System (Report CN 452.1, approved 2020-06-18, ATTAINS Action ID: R1_MA_2020_07)

Recommendations

2022 Recommendations
ALU: Conduct additional monitoring for nutrient enrichment indicators on summer ebb tides for the Squeteague Harbor AU (MA95-55). Be sure to get at least three samples per year for total nitrogen so seasonal averages can be calculated as per CALM requirements. Also collect continuous temperature data in the open waters/an area representative of the majority of the AU.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at four locations in Squeteague Harbor, Bourne/Falmouth (MA95-55) in the summers of 2015-2019, from inner to outer as follows: from a dock on the east shore, just south of Cataumet Harbor Beach (BBC_SQ1X), from a dock on the west shore, just opposite Cataumet Harbor Beach (BBC_SQ2A), open waters of the AU just a little south of Cataumet Harbor Beach (BBC_SQ2) and at the mouth of the harbor (BBC_SQ1N). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at BBC_SQ1X and SQ1N (at depths ranging 1.3-1.8m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 31°C (n=324), >29.4°C at BBC_SQ1X at surface and depth on one date each in July and August 2015 but no exceedances occurred in any subsequent year. The minimum dissolved oxygen (DO) (most data from BBC_SQ1X and SQ1N) was 1.5mg/L (n=312), measuring <6.0mg/L 69 times (~22% of the measurements overall) and <5.0mg/L 46 times (~15% of the measurements overall). The excursions from the 6.0mg/L criterion occurred most frequently (and severely) at the mouth of the harbor (BBC_SQ1N) at both surface and depth, although the conditions appeared to be much worse in some years than others (i.e., >10% frequency of measurements <6mg/L in 2015, 2016, and 2018). Total nitrogen sampling (n=20, maximum 0.82mg/L) during ebb tides in July and August at BBC_SQ2 and SQ1N documented seasonal average total nitrogen concentrations for sites/year with n>2 samples (at BBC_SQ1N) between 0.33 and 0.48mg/L. The maximum Chlorophyll <i>a</i> was 54.43µg/L (n=40), >5µg/L 31 times and >10µg/L nine times (23%). Secchi disk depths in the summers of 2015-2019 ranged from 0.9 to 3.0m (n=128), with yearly averages ranging between 1.3-2.1m. Ammonia-nitrogen concentrations were low (range 0.004 to 0.088mg/L (n=40)), but TUs could not be calculated (lack of quality assured pH and salinity data).</p> <p>The Aquatic Life Use for Squeteague Harbor (MA95-55) will continue to be assessed as Not Supporting with the Nutrient Eutrophication Biological Indicators impairment being carried forward based on BBC staff/volunteers data collected in the summers of 2015-2019.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_SQ1N	Buzzards Bay Coalition	Water Quality	Squeteague Harbor	Squeteague Harbor, Falmouth	41.657087	-70.61788
BBC_SQ1X	Buzzards Bay Coalition	Water Quality	Squeteague Harbor	Squeteague Harbor, Bourne	41.6637	-70.61995
BBC_SQ2	Buzzards Bay Coalition	Water Quality	Squeteague Harbor	Squeteague Harbor, Bourne	41.6633	-70.621636
BBC_SQ2A	Buzzards Bay Coalition	Water Quality	Squeteague Harbor	Squeteague Harbor, Bourne	41.663568	-70.622071

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_SQ1N	08/08/15	09/23/15	0.2	10	1.5	4.7	70	50	20
BBC_SQ1N	08/08/15	09/23/15	1.9	10	2.0	4.0	90	80	50
BBC_SQ1N	05/31/16	09/20/16	0.2	21	2.5	5.9	38	24	19
BBC_SQ1N	05/31/16	09/20/16	1.6	21	3.0	5.0	57	43	29

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_SQ1N	05/31/17	09/16/17	0.2	22	5.0	7.0	5	0	0
BBC_SQ1N	05/31/17	09/16/17	1.5	20	5.5	7.0	5	0	0
BBC_SQ1N	05/30/18	09/19/18	0.2	22	2.5	5.2	59	41	23
BBC_SQ1N	05/30/18	09/19/18	1.5	20	2.5	5.1	70	45	25
BBC_SQ1N	05/30/19	09/18/19	0.2	21	6.0	8.2	0	0	0
BBC_SQ1N	05/30/19	09/18/19	1.7	21	4.0	7.3	10	5	0
BBC_SQ1X	06/03/15	09/22/15	0.2	11	6.0	7.0	0	0	0
BBC_SQ1X	05/29/15	09/22/15	1.4	14	6.0	7.3	0	0	0
BBC_SQ1X	06/24/16	09/08/16	0.2	9	6.0	7.2	0	0	0
BBC_SQ1X	06/24/16	09/24/16	1.4	14	5.5	7.1	7	0	0
BBC_SQ1X	06/13/17	09/14/17	0.2	12	6.5	7.9	0	0	0
BBC_SQ1X	06/13/17	09/08/17	1.3	12	6.0	7.4	0	0	0
BBC_SQ1X	05/31/18	09/20/18	0.2	14	6.5	7.8	0	0	0
BBC_SQ1X	05/31/18	09/20/18	1.4	15	6.5	7.7	0	0	0
BBC_SQ1X	06/05/19	09/24/19	0.2	10	6.5	8.1	0	0	0
BBC_SQ1X	06/05/19	09/24/19	1.5	11	7.0	7.9	0	0	0
BBC_SQ2	08/03/17	08/03/17	0.2	1	6.8	6.8	0	0	0
BBC_SQ2A	07/20/17	07/20/17	0.2	1	5.3	5.3	100	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_SQ1N	07/27/15	09/23/15	0.2	13	11	26.5	24.4	0
BBC_SQ1N	07/27/15	09/23/15	1.8	13	11	26.5	24.4	0
BBC_SQ1N	05/31/16	09/20/16	0.2	25	22	29.0	23.6	0
BBC_SQ1N	05/31/16	09/20/16	1.6	25	22	28.0	23.8	0
BBC_SQ1N	05/31/17	09/16/17	0.2	23	21	25.0	20.4	0
BBC_SQ1N	05/31/17	09/16/17	1.5	20	18	26.0	20.5	0
BBC_SQ1N	05/30/18	09/19/18	0.2	25	23	26.0	21.3	0
BBC_SQ1N	05/30/18	09/19/18	1.5	21	19	25.0	21.0	0
BBC_SQ1N	05/30/19	09/18/19	0.2	24	22	26.3	22.1	0
BBC_SQ1N	05/30/19	09/18/19	1.7	21	19	26.2	21.7	0
BBC_SQ1X	06/03/15	09/22/15	0.2	11	10	30.0	25.8	2
BBC_SQ1X	06/03/15	09/22/15	1.4	13	12	31.0	27.1	2
BBC_SQ1X	06/13/17	09/14/17	0.2	12	12	25.0	22.4	0
BBC_SQ1X	06/13/17	09/08/17	1.4	11	11	25.6	23.0	0
BBC_SQ1X	05/31/18	09/20/18	0.2	14	12	29.2	22.0	0
BBC_SQ1X	05/31/18	09/20/18	1.3	15	13	27.2	23.1	0
BBC_SQ1X	06/05/19	09/24/19	0.2	10	9	26.0	22.1	0
BBC_SQ1X	06/05/19	09/24/19	1.5	11	10	26.0	22.0	0
BBC_SQ2	07/27/15	08/25/15	0.2	3	3	27.0	25.0	0
BBC_SQ2	07/05/16	08/15/16	0.2	4	4	29.0	27.0	0
BBC_SQ2	08/03/17	08/17/17	0.2	2	2	24.0	23.9	0
BBC_SQ2	07/10/18	08/21/18	0.2	4	4	26.0	23.2	0
BBC_SQ2	07/25/19	08/15/19	0.2	3	3	25.0	25.0	0
BBC_SQ2A	07/20/17	07/20/17	0.2	1	1	26.8	26.8	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_SQ1N	2015	0.2	3	0.32	0.35	0.33	3	4.10	8.73	6.71	1	0
BBC_SQ1N	2015	1.3	3	0.28	0.62	0.48	3	5.68	8.14	6.65	0	0
BBC_SQ1N	2016	0.2	1	0.54	0.54	0.54	4	3.08	19.79	8.50	2	1
BBC_SQ1N	2016	1.6	2	0.47	0.54	0.51	4	2.89	12.96	6.50	2	1
BBC_SQ1N	2017	0.2	2	0.47	0.52	0.49	2	5.49	5.71	5.60	0	0
BBC_SQ1N	2018	0.2	3	0.33	0.47	0.40	4	4.01	9.63	7.02	1	0
BBC_SQ1N	2019	0.2	1	0.32	0.32	0.32	3	5.12	22.84	11.38	0	1
BBC_SQ2	2015	0.2	2	0.24	0.45	0.35	3	5.36	9.75	7.03	0	0
BBC_SQ2	2016	0.2	1	0.49	0.49	0.49	4	2.53	54.43	17.38	2	1
BBC_SQ2	2017	0.2	1	0.82	0.82	0.82	2	8.85	12.12	10.49	0	1
BBC_SQ2	2018	0.2	--	--	--	--	4	8.98	33.95	15.79	0	2
BBC_SQ2	2019	0.2	1	0.74	0.74	0.74	3	4.93	36.24	16.98	1	1
BBC_SQ2A	2017	0.2	--	--	--	--	1	17.25	17.25	17.25	0	1

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_SQ1N	08/08/15	09/14/15	7	1.8	2.9	2.1
BBC_SQ1N	06/06/16	09/20/16	18	1.6	3.0	2.1
BBC_SQ1N	06/07/17	09/16/17	17	1.6	2.4	1.9
BBC_SQ1N	05/30/18	09/19/18	19	1.2	2.5	1.9
BBC_SQ1N	05/30/19	09/18/19	18	1.1	3.0	2.1
BBC_SQ1X	05/29/15	09/15/15	9	0.9	1.8	1.4
BBC_SQ1X	06/24/16	09/02/16	8	1.1	1.7	1.4
BBC_SQ1X	06/22/17	09/08/17	8	1.1	1.6	1.3
BBC_SQ1X	06/12/18	08/23/18	5	1.1	1.8	1.5
BBC_SQ1X	06/05/19	09/11/19	7	1.1	1.9	1.5
BBC_SQ2	07/05/16	08/15/16	4	1.4	2.7	2.0
BBC_SQ2	08/03/17	08/17/17	2	1.8	1.9	1.9
BBC_SQ2	07/10/18	08/21/18	4	1.3	1.8	1.6
BBC_SQ2	08/08/19	08/15/19	2	1.8	2.0	1.9

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_SQ1N	07/27/15	08/25/15	0.2	3	0.009	0.088	0.036
BBC_SQ1N	07/27/15	08/25/15	1.3	3	0.008	0.015	0.012
BBC_SQ1N	07/05/16	08/15/16	0.2	4	0.006	0.012	0.008
BBC_SQ1N	07/05/16	08/15/16	1.7	4	0.008	0.016	0.011
BBC_SQ1N	08/03/17	08/17/17	0.2	2	0.006	0.007	0.007
BBC_SQ1N	07/10/18	08/21/18	0.2	4	0.004	0.008	0.005
BBC_SQ1N	07/25/19	08/15/19	0.2	3	0.004	0.007	0.005
BBC_SQ2	07/27/15	08/25/15	0.2	3	0.005	0.013	0.010
BBC_SQ2	07/05/16	08/15/16	0.2	4	0.006	0.018	0.012
BBC_SQ2	08/03/17	08/17/17	0.2	2	0.007	0.008	0.008
BBC_SQ2	07/10/18	08/21/18	0.2	4	0.004	0.004	0.004
BBC_SQ2	07/25/19	08/15/19	0.2	3	0.004	0.009	0.006
BBC_SQ2A	07/20/17	07/20/17	0.2	1	0.004	0.004	0.004

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Squeteague Harbor (MA95-55); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Squeteague Harbor (MA95-55): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1174 sq mi (80%). The approved shellfish growing area represents 0.0011 sq mi (1%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications, a fecal coliform impairment is being added.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB50.0	Megansett Harbor	Approved	0.00108	0.7%
BB50.3	Squeteague Harbor	Conditionally Approved	0.11632	79.4%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Squeteague Harbor (MA95-55) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There is one beach in Squeteague Harbor, Bourne (MA95-55) known as Cataumet Harbor (ID 2657). This beach was never posted for swimming between 2014 and 2019. The Primary Contact Recreational Use for Squeteague Harbor (MA95-55) is assessed as Fully Supporting since there were no swimming advisory postings at the Cataumet Harbor Beach between 2014 and 2019.	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2657	Cataumet Harbor/Bourne	41.66461	-70.62020	41.66388	-70.61950	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Squeteague Harbor (MA95-55): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1174 sq mi (80%). The approved shellfish growing area represents 0.0011 sq mi (1%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There is one beach in Squeteague Harbor, Bourne (MA95-55) known as Cataumet Harbor (ID 2657). This beach was never posted for swimming between 2014 and 2019. The Secondary Contact Recreational Use for Squeteague Harbor (MA95-55) is assessed as Fully Supporting since there were no swimming advisory postings at the Cataumet Harbor Beach between 2014 and 2019.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Squeteague Harbor (MA95-55): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1174 sq mi (80%). The approved shellfish growing area represents 0.0011 sq mi (1%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

The Let (MA95-88)

Location:	From north of East Beach Road, Westport to the confluence with Horseneck Channel, Westport.
AU Type:	ESTUARY
AU Size:	0.22 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	5	Estuarine Bioassessments		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					

Designated Use Attainment Decisions

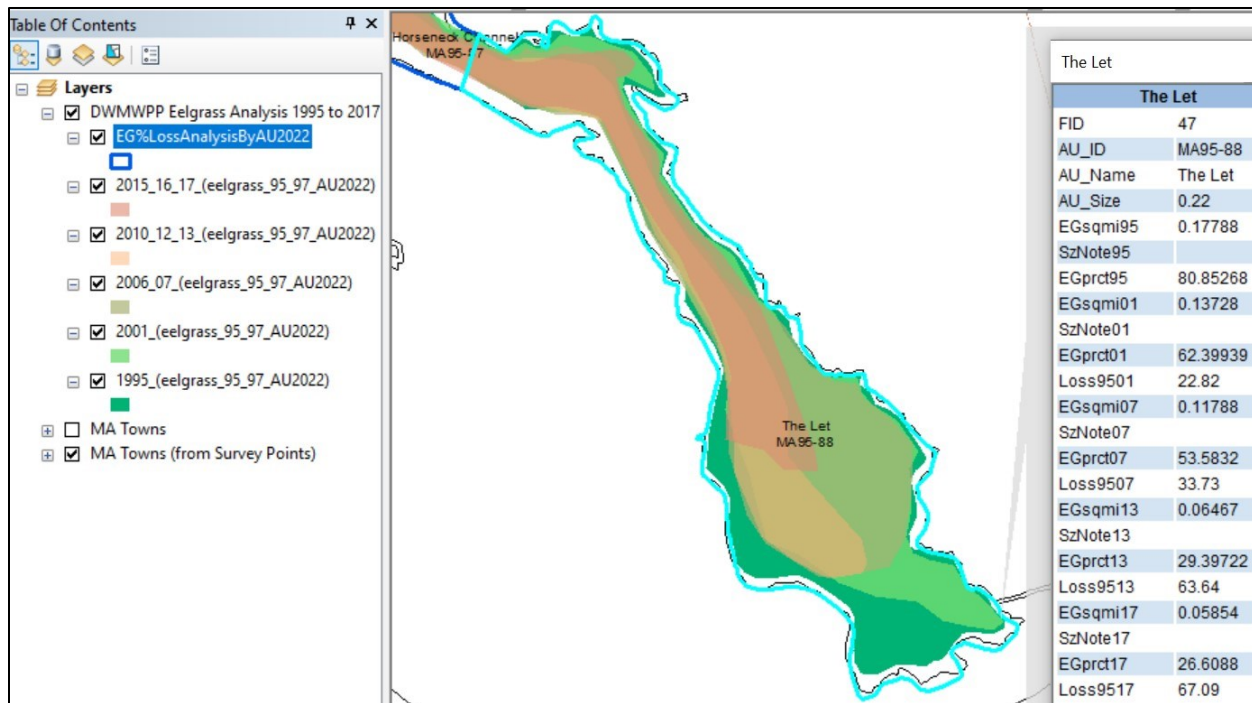
Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>The MassDEP Eelgrass Mapping Project documented an ~67% loss of eelgrass bed habitat in The Let between 1995 and 2017.</p> <p>The Aquatic Life Use for The Let (MA95-88) is assessed as Not Supporting, based on the loss of eelgrass bed habitat documented by the MassDEP Eelgrass Mapping Project between 1995 and 2017. An Estuarine Bioassessment impairment is being added.</p>	

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for The Let MA95-88 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~67% loss of eelgrass bed habitat in The Let between 1995 and 2017.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in The Let (MA95-88); therefore the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Insufficient Information	YES
2022 Use Attainment Summary	
The Let (MA95-88): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2087 sq mi (97%). The approved shellfish growing area represents 0.2066 sq mi (96%). The prohibited shellfish growing area represents 0.0021 sq mi (1%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB4.0	Horseneck Channel & The Let	Approved	0.17348	80.3%
BB4.30	The Let, Northwest	Approved	0.01717	8.0%
BB4.31	The Let, Southwest	Approved	0.01595	7.4%

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB4.4	Taber Point Creek	Prohibited	0.00206	1.0%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for The Let (MA95-88) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the status of the Primary Contact Recreation Use for The Let (MA95-88) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
The Let (MA95-88): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2087 sq mi (97%). The approved shellfish growing area represents 0.2066 sq mi (96%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the status of the Secondary Contact Recreation Use for The Let (MA95-88) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
The Let (MA95-88): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2087 sq mi (97%). The approved shellfish growing area represents 0.2066 sq mi (96%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Three Cornered Pond (MA95145)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	12 ACRES
Classification/Qualifier:	B

No usable data were available for Three Cornered Pond (MA95145) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Tihonet Pond (MA95146)

Location:	Wareham.
AU Type:	FRESHWATER LAKE
AU Size:	87 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Fish Passage Barrier*)		Added
5	5	Dissolved Oxygen		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Hydrostructure Impacts on Fish Passage (Y)	X				
Dissolved Oxygen	Source Unknown (N)	X				

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>DMF biologists note one structure in the south-west corner of Tihonet Pond, causing passage limitation to diadromous fish between the pond and the Wankinco River AU below (MA95-103). The Tihonet Pond Dam (NATID# MA00030) (with existing fishway) was given a passage score of "4" on a 0-10 scale (with 10 equating to no possible passage), indicating that the dam restricts the passage of the targeted species, river herring and American eel, with a population score of "5". DMF biologists note an improved outlet was installed at this location in 2010 and a visit was made to the site in 2020 to plan a reconstruction project. The flow from this outlet follows a channel separate to the Wankinko River AU MA95-85 (which lies further east), but also discharges to Parker Mills Pond.</p> <p>The Aquatic Life Use for Tihonet Pond (MA95146) will continue to be assessed as Not Supporting with the Dissolved Oxygen impairment being carried forward. An impairment for Fish Passage Barrier is being added based on the barrier to diadromous fish passage at the Tihonet Pond Dam documented by DMF biologists.</p>	

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary

DMF biologists note one structure in the south-west corner of Tihonet Pond, causing passage limitation to diadromous fish between the pond and the Wankinco River AU below (MA95-103). The Tihonet Pond Dam (NATID# MA00030) (with existing fishway) was given a passage score of "4" on a 0-10 scale (with 10 equating to no possible passage), indicating that the dam restricts the passage of the targeted species, river herring and American eel, with a population score of "5". DMF biologists note an improved outlet was installed at this location in 2010 and a visit was made to the site in 2020 to plan a reconstruction project. The flow from this outlet follows a channel separate to the Wankinco River AU MA95-85 (which lies further east), but also discharges to Parker Mills Pond. The Aquatic Life Use for Tihonet Pond (Assessment Unit MA95146) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Tihonet Pond Dam.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
Although fish toxics sampling was done in Tihonet Pond in 1989, no site-specific fish consumption advisory was issued by DPH.	
The Fish Consumption Use for Tihonet Pond (MA95146) is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Tihonet Pond (MA95146) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for Tihonet Pond (MA95146) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Tihonet Pond (MA95146) so it is Not Assessed.	

Tinkham Pond (MA95148)

Location:	Mattapoisett/Acushnet.
AU Type:	FRESHWATER LAKE
AU Size:	17 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	4c	(Fish Passage Barrier*)		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Hydrostructure Impacts on Fish Passage (Y)	X				

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>DMF biologists note one structure in the southeast corner of Tinkham Pond, causing passage limitation to diadromous fish between the pond and the unnamed tributary AU below (MA95-101). The Tinkham Pond Dam (NATID# MA00353) was given a passage score of "10", on a 0-10 scale, indicating that the dam allows no possible passage of the targeted species, river herring and American eel from the mainstem Mattapoisett River up to Tinkham Pond (the population score in this area was noted to be "1"). DMF biologists noted poor habitat quality in 2014, but passage potential for river herring.</p> <p>The Aquatic Life Use for Tinkham Pond (MA95148) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Tinkham Pond Dam.</p>	

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
<p>DMF biologists note one structure in the SE corner of Tinkham Pond, causing passage limitation to diadromous fish between the pond and the unnamed tributary AU below (MA95-101). The Tinkham Pond Dam (NATID# MA00353) was given a passage score of "10", on a 0-10 scale, indicating that the dam allows no possible passage of the targeted species, river herring and American eel from the mainstem Mattapoisett River up to Tinkham Pond. The population score in this area was noted to be "1". DMF biologists noted poor habitat quality in 2014, but passage potential for river herring. The Aquatic Life Use for Tinkham Pond (Assessment Unit MA95148) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Tinkham Pond Dam.</p>

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Tinkham Pond (MA95148); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Tinkham Pond (MA95148) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	
<p>UMass Dartmouth staff collected <i>Enterococci</i> bacteria samples at this Tinkham Pond AU (MA95148) near the New Boston Rd trailhead access point (UMassD_1) between June and September 2019 (n=16). Data analysis of this single year high frequency dataset indicated that 19% of intervals had GM's >35 cfu/100 ml and 19% of samples exceeded the 130 cfu/100 ml STV. The seasonal GM was 26 cfu/100ml.</p> <p>Since the <i>Enterococci</i> data did not exceed the use attainment impairment thresholds for this single year high frequency dataset, the Primary Contact Recreational Use for Tinkham Pond AU (MA95148) is assessed as Fully Supporting. An Alert is being identified, however, since the percentage of samples that exceeded the STV was very close to the 20% cut-off.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
UMassD_1	UMass Dartmouth	Water Quality	Tinkham Pond	New Boston Rd trailhead access point.	41.681886	-70.85745

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (UMass-Dartmouth 2019) (MassDEP Undated4)

[Result units are CFU/100ml or MPN/100ml]

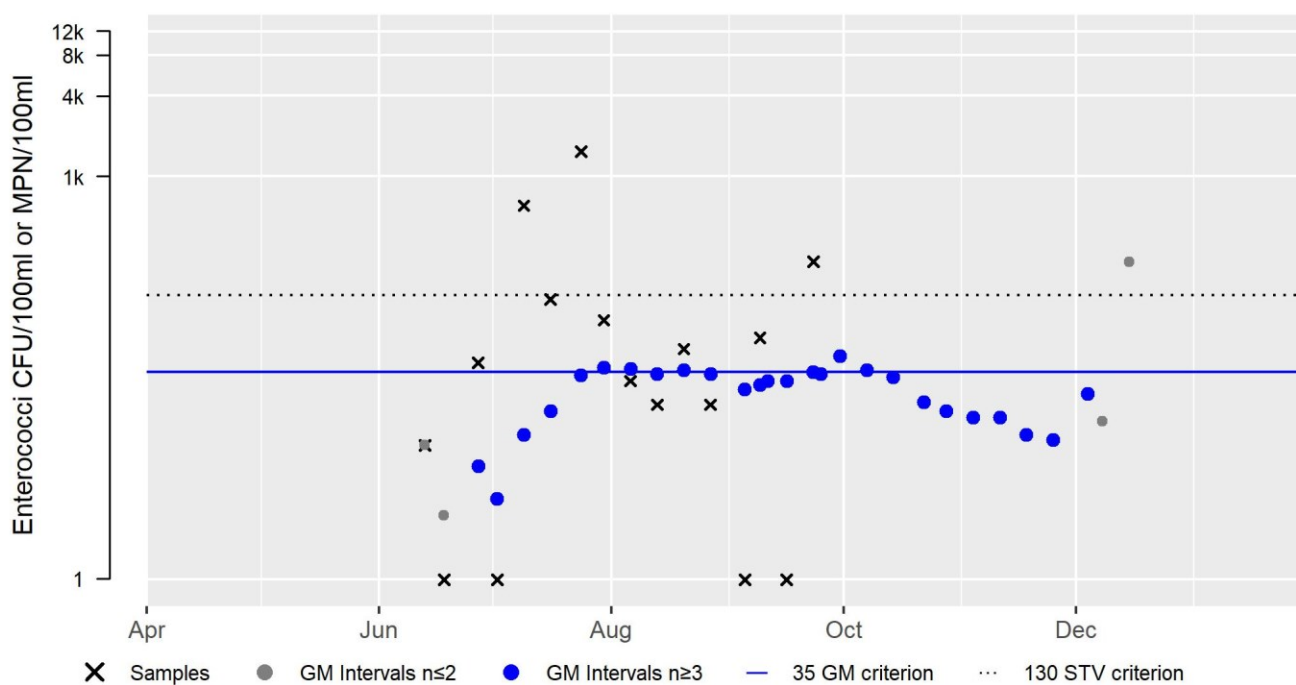
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
UMassD_1	UMass Dartmouth	Enterococci	06/13/19	09/23/19	16	1	1529	26

UMassD_1 Enterococci (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	16
SeasGM	26
#GMI	26
#GMI Ex	5
%GMI Ex	19
n>STV	3
%n>STV	19

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2019



Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Tinkham Pond (MA95148) so it is Not Assessed.	

Turner Pond (MA95151)

Location:	New Bedford/Dartmouth.
AU Type:	FRESHWATER LAKE
AU Size:	86 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	5	(Fish Passage Barrier*)		Added
4a	5	(Swollen Bladderwort*)		Added
4a	5	Enterococcus		Added
4a	5	Mercury in Fish Tissue	33880	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Hydrostructure Impacts on Fish Passage (Y)	X				
(Swollen Bladderwort*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
Enterococcus	Source Unknown (N)				X	
Mercury in Fish Tissue	Atmospheric Deposition - Toxics (Y)		X			
Mercury in Fish Tissue	Source Unknown (N)		X			

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
DMF biologists note one structure, the Turners Pond Dam, affecting the passage of diadromous fish between the Pond and the downstream AU (Paskamanset River MA95-11). The Turners Pond Dam(NATID# MA01152) was given a passage score of "10" on a 0-10 scale (with 10 equating to no possible passage), indicating that the dam is a major obstruction to the passage of the targeted species, river herring and American eel. The population score was noted to be "2". MassDEP staff reported an infestation of swollen bladderwort (<i>Utricularia inflata</i>) in Turner Pond during a 2017 field survey. The Aquatic Life Use for Turner Pond (MA95151) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Turners Pond Dam and the non-native aquatic macrophyte species "swollen bladderwort" (<i>Utricularia inflata</i>) infestation. Fish Passage Barrier and Swollen Bladderwort impairments are being added. The Alert for elevated phosphorus concentrations in the surface waters (documented during TMDL survey in 2000) and uncertainty over whether concentrations result from road runoff or other anthropogenic sources is being carried forward.	

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note one structure at the downstream end of this Turners Pond AU, assisting the passage of diadromous fish between the Pond and the downstream AU (Paskamanset River MA95-11). The Turners Pond Dam (NATID# MA01152) was given a passage score of "10" on a 0-10 scale (with 10 equating to no possible passage), indicating that the dam is a major obstruction to the passage of the targeted species, river herring and American eel. The population score was noted to be "2". The Aquatic Life Use for Turners Pond (Assessment Unit MA95151) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Turners Pond Dam.

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP Undated1)

Summary Statement
MassDEP staff reported an infestation of swollen bladderwort (<i>Utricularia inflata</i>) in Turner Pond during a 2017 field survey.

Fish Consumption

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
The Fish Consumption Use for this Turner Pond AU (MA95151) will continue to be assessed as Not Supporting with the Mercury in Fish Tissue impairment being carried forward. MA DPH advises Children under 12, pregnant women, nursing mothers, women of child-bearing age not to eat any fish from the pond, while the general public should limit all fish to 2 meals/month (MassDPH 2021).	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Turner Pond (MA95151) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
UMass Dartmouth staff collected <i>Enterococci</i> bacteria samples near the downstream end of Turner Pond (MA95151) near 51 Old Fall River Rd in N. Dartmouth (UMassD_5) between June and September 2019 (n=16). Data analysis indicated that 65% of the intervals had GM's >35 cfu/100 ml and 31% of samples exceeded the 130 cfu/100ml STV. The seasonal GM was 46 cfu/100 ml. Since the <i>Enterococci</i> data collected during the summer of 2019 exceeded the use attainment impairment thresholds for a single year high frequency dataset, the Primary Contact Recreational Use for Turner Pond AU (MA95151) is assessed as Not Supporting. An impairment for Enterococcus is being added.	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
UMassD_5	UMass Dartmouth	Water Quality	Turner's Pond	51 Old Fall River, N. Dartmouth, MA. Pond side.	41.679099	-70.976369

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (UMass-Dartmouth 2019) (MassDEP Undated4)

[Result units are CFU/100ml or MPN/100ml]

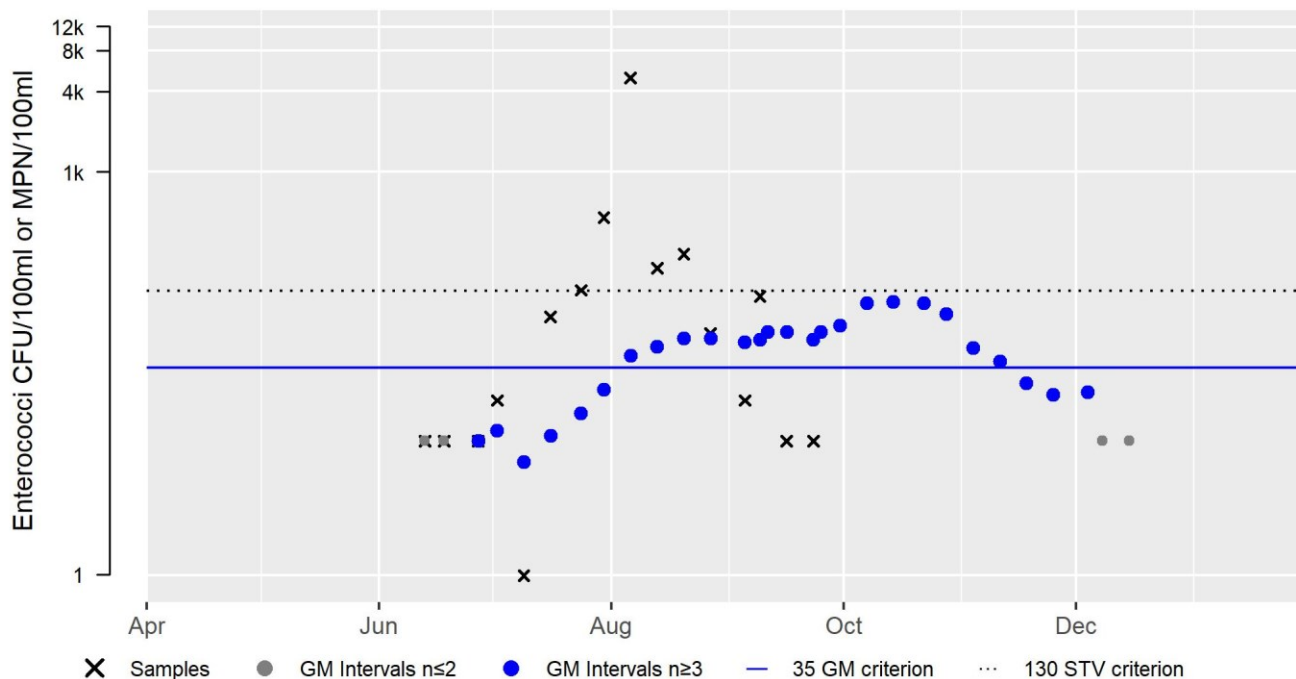
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
UMassD_5	UMass Dartmouth	Enterococci	06/13/19	09/23/19	16	1	5012	46

UMassD_5 Enterococci (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	16
SeasGM	46
#GMI	26
#GMI Ex	17
%GMI Ex	65
n>STV	5
%n>STV	31

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2019



Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for Turner Pond (MA95151) so it is Not Assessed.	

Union Pond (MA95152)

Location:	Wareham.
AU Type:	FRESHWATER LAKE
AU Size:	17 ACRES
Classification/Qualifier:	B

No usable data were available for Union Pond (MA95152) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

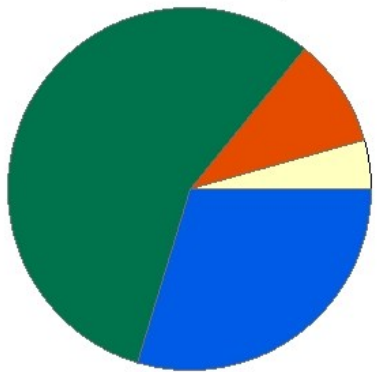
2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Unnamed Tributary (MA95-101)

Location:	Unnamed tributary to Mattapoissett River, outlet Tinkham Pond, Mattapoissett to mouth at confluence with Mattapoissett River, Mattapoissett.
AU Type:	RIVER
AU Size:	1.2 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA95-101

Watershed Area: 4.18 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	4.18	3.91	0.88	0.84
Agriculture	4.4%	4.4%	4.5%	4.1%
Developed	9.6%	9.7%	5%	5.2%
Natural	56.4%	55.6%	44.1%	43.5%
Wetland	29.6%	30.3%	46.4%	47.3%
Impervious Cover	3.5%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	4c	(Fish Passage Barrier*)		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Hydrostructure Impacts on Fish Passage (Y)	X				

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

DMF biologists note two structures causing passage limitation to diadromous fish in the upper half of this Unnamed Tributary to Mattapoisett River (AU MA95-101). The Tinkham Pond Dam (NATID# MA00353) causes passage limitation between the tributary and Tinkham Pond. The dam was given a passage score of "10", on a 0-10 scale, indicating that it allows no possible passage of the targeted species, river herring and American eel from the mainstem Mattapoisett River up to Tinkham Pond. The Decas bog flume was also given a passage score of "10", indicating restricted passage of fish between the mainstem Mattapoisett and Tinkham Pond. The population score at both structures was noted to be "1". Overall DMF biologists noted poor habitat quality at the dam in 2014, but passage potential for river herring. At the bog flume it was noted that project options to improve passage would be the removal of the flume or installation of an eel pass. MA DFG biologists also conducted backpack electrofishing in the downstream half of the AU above and below Acushnet Rd, Mattapoisett (SampleID 8523) in July 2019. The fish community at this low gradient habitat site was indicative of healthy conditions with moderately tolerant/intolerant macrohabitat generalists comprising 37% of the sample (namely redbfin pickerel and yellow perch). Crayfish were also present. The Aquatic Life Use for this Unnamed Tributary AU (MA95-101) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Tinkham Pond Dam and the Decas bog flume. A Fish Passage Barrier impairment is being added.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
8523	MassDFG	Fish Community	Tripps Mill Brook	Above and Below Acushnet Road, Mattapoisett	41.67914	-70.84641

Biological Monitoring Information

Fish Community Data and DELTS

Fish Community Data (2012-2019) Provided by MassDFG. (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net, Gradient: H = High, L = Low; I/MT MG= Intolerant/Moderately Tolerant Macrohabitat Generalist]

[Species List: AE = American Eel, GS = Golden Shiner, RP = Redfin Pickerel, YP = Yellow Perch]

Sample ID	Sample Date	Method	Sample Type	Gradient	Total Taxa	Total Ind	Cold Ind %	Fluvial Taxa	Fluvial Ind %	Intol Ind %	I/MT MG Taxa	I/MT MG Ind %	Notables	CFR	Species List
8523	07/16/19	BP	TP	L	4	19	0%	0	0%	0%	2	37%	Yes	No	AE, GS, RP, YP,

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary

DMF biologists note two structures causing passage limitation to diadromous fish in the upper half of this unnamed tributary to Mattapoissett River. The Tinkham Pond Dam (NATID# MA00353) causes passage limitation between the tributary and the pond AU upstream (Tinkham Pond MA95148). The dam was given a passage score of "10", on a 0-10 scale, indicating that it allows no possible passage of the targeted species, river herring and American eel from the mainstem Mattapoissett River up to Tinkham Pond. The Decas bog flume was also given a passage score of "10", indicating restricted passage of fish between the mainstem Mattapoissett and Tinkham Pond. The population score at both structures was noted to be "1". Overall DMF biologists noted poor habitat quality at the dam in 2014, but passage potential for river herring. At the bog flume it was noted that project options to improve passage would be the removal of the flume or installation of an eel pass. The Aquatic Life Use for unnamed tributary (Assessment Unit MA95-01) is assessed as Not Supporting, based on the barrier to diadromous fish passage at the Tinkham Pond Dam and the Decas bog flume.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Unnamed Tributary AU (MA95-101); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Unnamed Tributary (MA95-101) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E. coli</i> bacteria data are available to assess the Primary Contact Recreational Use for this Unnamed Tributary AU (MA95-101) so it is Not Assessed.	

Secondary Contact Recreation

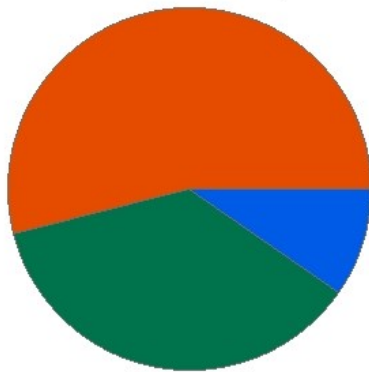
2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E. coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for this Unnamed Tributary AU (MA95-101) so it is Not Assessed.	

Unnamed Tributary (MA95-102)

Location:	Unnamed tributary to Cape Cod Canal, headwaters outlet Bourne Pond, Bourne to mouth at confluence with northern edge of Cape Cod Canal, Bourne.
AU Type:	RIVER
AU Size:	0.4 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA95-102

Watershed Area: 0.17 square miles



■ Percent Agriculture ■ Percent Natural
■ Percent Developed ■ Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.17	0.17	0.09	0.09
Agriculture	0%	0%	0%	0%
Developed	54%	54%	52.1%	52.1%
Natural	36.4%	36.4%	31.3%	31.3%
Wetland	9.6%	9.6%	16.6%	16.6%
Impervious Cover	31.8%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	4c	(Fish Passage Barrier*)		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Habitat Modification - other than Hydromodification (Y)	X				

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

DMF biologists note that the Bourne Pond outlet structure causes passage limitation to diadromous fish between this Unnamed Tributary AU (locally known as Bourne Pond Brook) (MA95-102) and Bourne Pond (MA95016). This structure was given a passage score of "7" on a 0-10 scale (with 10 equating to no possible passage), indicating that the outlet is a severe impediment to the passage of the targeted fish species, river herring and American eel. The population score was noted to be "1". DMF further noted that this area experiences low flow; the access is tide dependent, and the small size of the pond limits the potential of the habitat.

The Aquatic Life Use for this Unnamed Tributary (also known as Bourne Pond Brook) AU (MA95-102) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Bourne Pond outlet structure. A Fish Passage Barrier impairment is being added.

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note that the Bourne Pond outlet structure causes passage limitation to diadromous fish between Bourne Pond Brook (MA95-102) and Bourne Pond (MA95016). This structure was given a passage score of "7" on a 0-10 scale (with 10 equating to no possible passage), indicating that the outlet is a severe impediment to the passage of the targeted fish species, river herring and American eel. The population score was noted to be "1". DMF further noted that this area experiences low flow; the access is tide dependant, and the small size of the pond limits the potential of the habitat. The Aquatic Life Use for Bourne Pond Brook (Assessment Unit MA95-102) is assessed as Not Supporting based on the barrier to diadromous fish passage at the outlet structure.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Unnamed Tributary AU (MA95-102); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Unnamed Tributary AU (MA95-102) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E. coli</i> bacteria data are available to assess the Primary Contact Recreational Use for this Unnamed Tributary AU (MA95-102) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E. coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for this Unnamed Tributary AU (MA95-102) so it is Not Assessed.	

Unnamed Tributary (MA95-57)

Location:	Headwaters, outlet of Cornell Pond, Dartmouth to mouth at confluence with Shingle Island River, Dartmouth.
AU Type:	RIVER
AU Size:	1 MILES
Classification/Qualifier:	A: PWS, ORW (Tributary)

No usable data were available for Unnamed Tributary (MA95-57) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

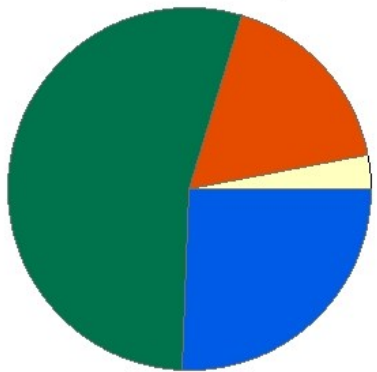
2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Unnamed Tributary (MA95-75)

Location:	Unnamed tributary to Bread and Cheese Brook, headwaters north of Briggs Road, Westport to confluence with Bread and Cheese Brook, Westport.
AU Type:	RIVER
AU Size:	1.9 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA95-75

Watershed Area: 9.04 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	9.04	6.79	1.76	1.34
Agriculture	3%	3.3%	2.5%	3.2%
Developed	17.4%	20.8%	8.5%	10.9%
Natural	54%	47.4%	51.5%	43.7%
Wetland	25.6%	28.5%	37.5%	42.2%
Impervious Cover	7.7%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	5	Escherichia Coli (E. Coli)		Added
2	5	Temperature		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Escherichia Coli (E. Coli)	Source Unknown (N)				X	
Temperature	Source Unknown (N)	X				

Recommendations

2022 Recommendations
ALU: Additional sampling must be conducted for metals (including lead and aluminum) downstream of Gifford Rd, Westport, to better evaluate lead and aluminum toxicity concerns.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
<p>MassDEP biologists conducted biological and water quality sampling in this Unnamed Tributary to Bread and Cheese Brook (locally known as Hemlock Gutter) (MA95-75), ~75 meters downstream of Gifford Road, Westport, as part of the MAP2 monitoring project in the summer of 2013. DFG identifies this brook as a CFR. Backpack electrofishing in September 2013 (SampleID 5075) resulted in a sample comprised of 10 individuals, three of which were Eastern Brook Trout (all ≤ 140mm), the rest all American eel. The July 2013 benthic sample (B0853) IBI score (54) compared to the high gradient Central_Hills_300ct_SE index was indicative of moderately degraded conditions, though was within 1 point of a satisfactory condition score so was considered acceptable in this ecoregional area. Water quality sampling data (W2394), including both deployed probe and discrete sampling efforts, can be summarized as follows: the minimum dissolved oxygen (DO) was 6.0mg/L during the 104 day probe deployment (the 7DADMin were all >6.0mg/L), the maximum temperature between June 1st and September 15th was 26.2°C, with 7-DADM temperatures exceeding the cold water criterion of 20°C 59 times, while the max 24hr rolling average temperatures of 24.1°C and 24.2°C (during the two deployments of 88 and 89 days length) exceeded the acute threshold (23.5 °C). The pH was also low (range 4.9 to 5.7SU, n=3). There were no physico-chemical indicators of nutrient enrichment problems (seasonal average total phosphorus concentration of 0.075mg/L (n=4), max diel DO shift 1.4mg/L, max saturation 89.7%, max pH 5.7SU, and there were no observations of any dense/very dense filamentous algae during the eight site visits). With the exception of two chronic lead criterion exceedances (TU's of 6.4 and 8.1), and one acute and two chronic aluminum criteria exceedances (acute TU 1.01, chronic TUs 1.9 and 2.0 calculated using the Buzzards Bay default freshwater aluminum criteria), there were no other toxicant issues (maximum total ammonia-nitrogen concentration 0.09mg/L, chloride 58mg/L, specific conductance was 258µS/cm, and there were no other exceedances of any of clean metals (n=3).</p> <p>The Aquatic Life Use for this Unnamed Tributary AU (locally known as Hemlock Gutter) (MA95-75) is assessed as Not Supporting. Although the biological and most water quality data collected by MassDEP staff during the summer of 2013 were indicative of generally good conditions, a temperature impairment is being added based on the frequent exceedances of both the acute and chronic temperature criteria/thresholds for this Tier 1 Existing Use Cold Water. This small (~9mi²) watershed is ~79.6% natural/wetland with 7.7% Impervious Cover, and the proximal stream buffer is also disturbed (85.9% natural/wetland), so the occurrences of high temperature cannot be considered solely naturally occurring although there are no dams or permitted water withdrawals in the drainage area. The low pH is considered naturally occurring given the presence of wetlands in the system (~37.5% along the 100m stream buffer). Alerts are being identified for the acute and/or chronic criteria exceedances for aluminum and lead (although these may be influenced by wetlands).</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
5075	MassDEP	Fish Community	Hemlock Gutter (UNT to Bread & Cheese Br)	~50 ft D/S to bridgem ~75ft DS/E of Gifford Rd xing	41.64181	-71.07646
B0853	MassDEP	Benthic	Unnamed And/Or Undefined Saris/	[unnamed tributary to Bread and Cheese Brook approximately 25 meters downstream/east of Gifford Road, Westport, MA]	41.641806	-71.076457
W2394	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary to Bread and Cheese Brook approximately 75 feet downstream/east of Gifford Road, Westport]	41.641806	-71.076457

*Biological Monitoring Information**Benthic Macroinvertebrate Data***MassDEP Benthic Macroinvertebrate Data (2011-2017).** (MassDEP Undated5)

[Index Biological Condition Class: E= Exceptional, S= Satisfactory, MD= Moderately Degraded, SD= Severely Degraded; High Gradient IBI Thresholds: E= 100-75, S= 74-55, MD= 54-35, SD= 34-0; Low Gradient IBI Thresholds: E= 100-81, S= 80-62, MD= 61-38, SD= 37-0; R qualifier = Rarefaction (100ct) <55]

Station Code	Collection Date	Collection Method	Index Type	Organism Count	Index Score	Index Biological Condition Class
B0853	07/08/13	RBP kicknet	Central_Hills_300ct_SE	315	54	MD

*Fish Community Data and DELTS***Fish Community Data (2012-2019) Provided by MassDFG.** (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net]

[Species List: AE = American Eel, EBT = Brook Trout]

Sample ID	Sample Date	Method	Sample Type	Total Taxa	Total Ind	EBT Ind	EBT Min Length (mm)	EBT Max Length (mm)	EBT ≤140mm Ind	SC Ind	Cold Ind %	Fluvial Ind %	Notables	CFR	Species List
5075	09/13/13	BP	TP	2	10	3	94	105	3	0	30%	30%	No	Yes	AE, EBT,

*Physico-chemical Water Quality Information**DO, pH, Temperature***MassDEP Long-term Continuous Dissolved Oxygen Data (2011-2018).** (MassDEP Undated11) (MassDEP Undated6)

[7DADMin= 7-Day Average of the Daily Minima, 7DADA= 7-Day Average of the Daily Average, CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Day Count	7day Count	30day Count	DO Min (mg/L)	Min 7DADMin (mg/L)	Min 7DADA (mg/L)	Delta DO Max (mg/L)	Count CW 7DADMin <6.0	Count CW 1Day Min <5.0	Count WW Early Life Stages 7DADA <6.5	Count WW Early Life Stages 1Day Min <5.0	Count WW Other Life Stages 7DADMin <5.0	Count WW Other Life Stages 1Day Min <4.0	Count CW 30DADA <8.0	Count WW Other Life Stages 30DADA <6.0
W2394	06/20/13	10/01/13	104	98	75	6	6.3	6.7	1.4	0	0	0	0	0	0	60	0

MassDEP Discrete Dissolved Oxygen Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	DO Count	DO Min (mg/L)	DO Avg (mg/L)	Count CW <5.0	Count WW Early Life Stages <5.0	Count WW Other Life Stages <4.0
W2394	06/19/13	10/02/13	2	7.6	7.9	0	0	0

MassDEP Long-term Continuous Temperature Data (Summer Index 2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; Max Daily Mean= Maximum 24-Hour Average, 7DADM= 7-Day Average of the Daily Maxima, 7DADA= 7-Day Average of the Daily Average, CW= Coldwater, WW= Warmwater; NOTE: In the case of more than one row of data in the same year for a site, different types of temperature probes were deployed.]

Station Code	Start Date	End Date	Index Count	7day Count	Max Daily Mean (°C)	Max Temp (°C)	Max 7DADM (°C)	Max 7DADA (°C)	Count CWTier1 7DADM >20	Count CWTier1 Daily Mean >23.5	Count CWTier2 7DADA >21	Count CWTier2 Daily Mean >24.1	Count WW 7DADM >27.7	Count WW Daily Mean >28.3
W2394	06/20/13	09/15/13	88	85	23.9	26.0	25.3	23.3	59	2	22	0	0	0
W2394	06/20/13	09/15/13	88	85	24.1	26.2	25.4	23.4	59	3	22	0	0	0

24-hour Rolling Average Calculations for MassDEP Short- and Long-term Continuous Temperature Data (Summer Index 2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater; NOTE: In the case of more than one row of data in the same year for a site, different types of temperature probes were deployed.]

Station Code	Start Date	End Date	Count Days Deployed	24hr Rolling Count	Max 24hr Avg Rolling Temp (°C)	Count CWTier1 24hr Avg Rolling >23.5 °C	Count CWTier2 24hr Avg Rolling >24.1 °C	Count WW 24hr Avg Rolling >28.3°C
W2394	06/19/13	09/15/13	89	4202	24.2	126	15	0
W2394	06/19/13	09/15/13	89	4202	24.1	116	0	0

MassDEP Discrete Temperature Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

Station Code	Start Date	End Date	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count CW >20	Count CW >22	Count WW >28.3	Count WW >30.3
W2394	06/19/13	10/02/13	5	3	19.6	17.2	0	0	0	0

MassDEP Discrete pH Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

Station Code	Start Date	End Date	pH Count	pH Min (SU)	pH Max (SU)	pH Count <6.5 & >8.3	pH Count <6.0 & >8.8
W2394	06/19/13	10/02/13	3	4.9	5.7	3	3

Nutrients (Primary Producer Screening, Physico-chemical Screening)

MassDEP Nutrient Enrichment Indicator Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	Delta DO Max (mg/L)	Delta DO Avg (mg/L)	DO Sat Max (%)	pH Max (SU)	Count Algal Obsv.	Dense/V. Dense Film/Fila. Algae
W2394	2013	4	0.043	0.094	0.075	1.4	0.8	89.7	5.7	8	0

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

MassDEP Clean Metals Water Column Data (2011-2018), Acute Criteria Violations. (MassDEP Undated11) (MassDEP Undated6)

[CMC= Criterion Maximum Concentration, TU= Toxic Unit]

Station Code	Data Year	Metals Count	As CMC TU >1	Cd CMC TU >1	Cr III CMC TU >1	Cu CMC TU >1	Pb CMC TU >1	Ni CMC TU >1	Ag CMC TU >1	Zn CMC TU >1
W2394	2013	3	0	0	0	0	0	0	0	0

MassDEP Clean Metals Water Column Data (2011-2018), Chronic Criteria Violations. (MassDEP Undated11) (MassDEP Undated6)

[CCC= Criterion Continuous Concentration, TU= Toxic Unit]

Station Code	Data Year	Metals Count	As CCC TU >1	Cd CCC TU >1	Cr III CCC TU >1	Cu CCC TU >1	Pb CCC TU >1	Ni CCC TU >1	Se CCC TU >1	Zn CCC TU >1
W2394	2013	3	0	0	0	0	2	0	0	0

MassDEP Clean Metals Water Column Data (2011-2018), Selected TU Calculations. (MassDEP Undated11) (MassDEP Undated6)

[CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

Station Code	Sample Date	Cd CMC TU	Cd CCC TU	Cu CMC TU	Cu CCC TU	Pb CMC TU	Pb CCC TU
W2394	06/04/13	0.3	0.5	0.7	0.93	0.3	8.1
W2394	07/16/13	0.2	0.4	0.3	0.45	0.3	6.4
W2394	08/26/13	0.1	0.3	0.1	0.16	0.0	0.7

MassDEP Dissolved Aluminum Water Column Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Since only dissolved aluminum data were available, these data were compared to the default freshwater criteria for total recoverable aluminum (TRA), presented in Appendix E of MassDEP's 2022 CALM. As dissolved Al is a fraction of TRA, an exceedance count of 0 does not rule out violations of the TRA criteria. CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

Station Code	Data Year	Dissolved Al Count	Al Min (mg/L)	Al Max (mg/L)	Al Avg (mg/L)	Al CMC TU Max	Al CCC TU Max	Al CMC TU >1	Al CCC TU >1
W2394	2013	3	0.140	0.46	0.347	1.0	2.0	1	2

MassDEP Total Ammonia Nitrogen (TAN) Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[TAN= NH₃ + NH₄⁺]

Station Code	Data Year	TAN Count	TAN Min (mg/L)	TAN Max (mg/L)	TAN Avg (mg/L)	Count TAN >Chronic	Count TAN >Acute
W2394	2013	3	0.020	0.090	0.047	0	0

MassDEP Chloride Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Chloride Count	Chloride Min (mg/L)	Chloride Max (mg/L)	Chloride Avg (mg/L)	Count Chloride >230	Count Chloride >860
W2394	2013	3	47	58	52	0	0

MassDEP Discrete Specific Conductance Data (2011-2018) Compared to Estimated Chloride Criteria. (MassDEP Undated11) (MassDEP Undated6)

Station Code	Start Date	End Date	SpCond Count	SpCond Min (μ S/cm)	SpCond Max (μ S/cm)	Count SpCond >904	Count SpCond >994	Count SpCond >3193	Count SpCond >3512	Consecutive sets >904	Consecutive sets >994
W2394	06/19/13	10/02/13	3	209	258	0	0	0	0	0	0

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Unnamed Tributary AU (MA95-75); therefore the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
MassDEP staff conducted water quality field surveys for this Unnamed Tributary AU to Bread and Cheese Brook (locally known as Hemlock Gutter) (MA95-75), at a site approximately 75 feet downstream/east of Gifford Road, Westport (W2394), as part of the MAP2 monitoring project during the summer of 2013. There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews at this site (n=8). The Aesthetics Use for this Unnamed Tributary AU (MA95-75) is assessed as Fully Supporting based on the general lack of any objectionable conditions noted by MassDEP staff during the summer of 2013.	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2394	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary to Bread and Cheese Brook approximately 75 feet downstream/east of Gifford Road, Westport]	41.641806	-71.076457

Aesthetic Observations

Aesthetics Summary Statements for MassDEP Stations (2011-2018) (MassDEP Undated6)

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W2394	Unnamed Tributary	2013	8	MassDEP aesthetics observations for station W2394/MAP2-396 on Unnamed Tributary can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013.

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W2394	2013	8	8	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W2394	Unnamed Tributary	2013	Color	Light Yellow/Tan	1	8
W2394	Unnamed Tributary	2013	Color	Reddish	7	8
W2394	Unnamed Tributary	2013	Objectionable Deposits	No	6	8
W2394	Unnamed Tributary	2013	Objectionable Deposits	Yes	2	8
W2394	Unnamed Tributary	2013	Odor	None	7	8
W2394	Unnamed Tributary	2013	Odor	NR	1	8
W2394	Unnamed Tributary	2013	Scum	No	3	8
W2394	Unnamed Tributary	2013	Scum	Yes	5	8
W2394	Unnamed Tributary	2013	Turbidity	None	7	8
W2394	Unnamed Tributary	2013	Turbidity	Slightly Turbid	1	8

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff collected <i>E. coli</i> bacteria samples in this Unnamed Tributary to Bread and Cheese Brook (locally known as Hemlock Gutter) (MA95-75), approximately 75 feet downstream/east of Gifford Road in Westport (W2394) between May and September 2013, as part of the MAP2 monitoring project (n=5). Data analysis indicated that 100% of intervals had GM's >126 cfu/100 ml and 2 samples exceeded the 410 cfu/100 ml STV. The seasonal GM was 589 cfu/100 ml. Since the <i>E. coli</i> concentrations exceeded the use attainment impairment threshold for this single year low frequency dataset, the Primary Contact Recreational Use for this Unnamed Tributary (MA95-75) is assessed as Not Supporting. An <i>E. Coli</i> impairment is being added.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2394	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary to Bread and Cheese Brook approximately 75 feet downstream/east of Gifford Road, Westport]	41.641806	-71.076457

Bacteria Data**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP Undated11) (MassDEP Undated6)**

[Result units are CFU/100ml or MPN/100ml]

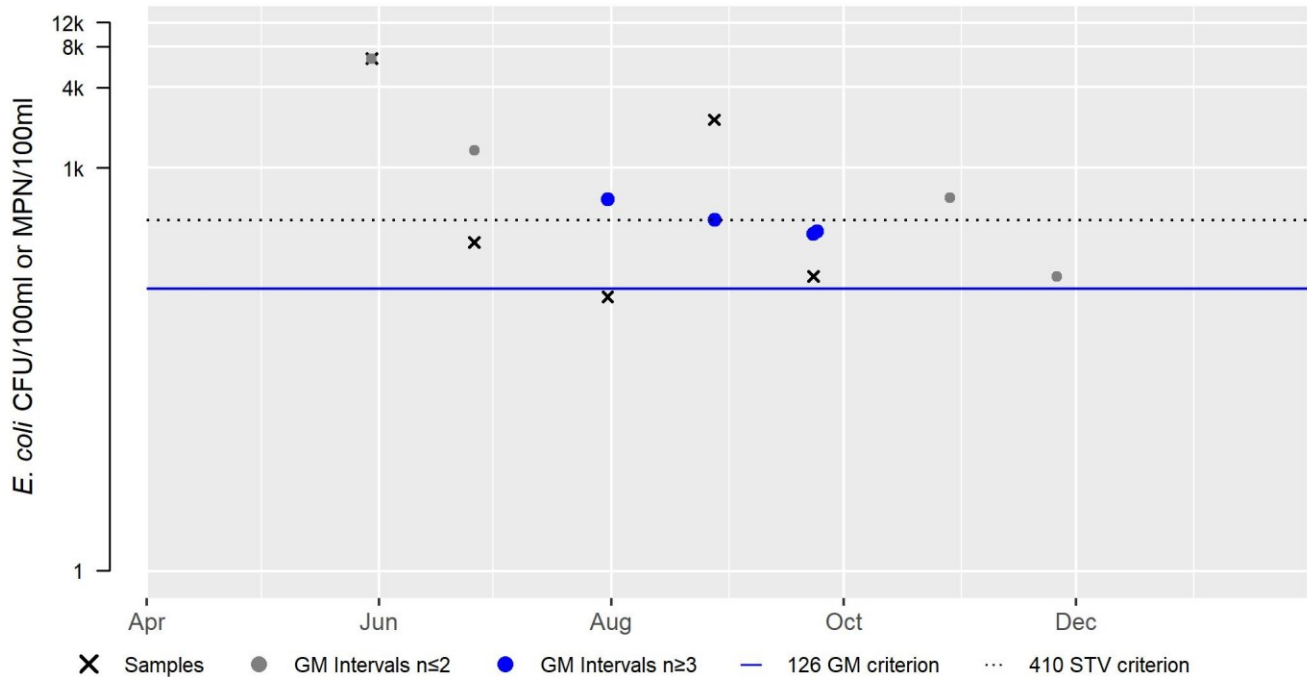
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
W2394	MassDEP	E. coli	05/30/13	09/23/13	5	110	6490	589

W2394 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	5
SeasGM	589
#GMI	4
#GMI Ex	4
%GMI Ex	100
n>STV	2
%n>STV	40

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2013



Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	

MassDEP staff collected *E. coli* bacteria samples at this Unnamed Tributary to Bread and Cheese Brook (locally known as Hemlock Gutter) (MA95-75), approximately 75 feet downstream/east of Gifford Road in Westport (W2394) between May and September 2013, as part of the MAP2 monitoring project (n=5). Data analysis indicated that none of the intervals had GM's >630 cfu/100 ml; 2 samples exceeded the 1260 cfu/100 ml STV and the seasonal GM was 589 cfu/100 ml.

Since the *E. coli* concentrations did not exceed the use attainment impairment threshold for this single year low frequency dataset, the Secondary Contact Recreational Use for this Unnamed Tributary (MA95-75) is assessed as Fully Supporting. An Alert is being identified however due to the extremely elevated *E.coli* concentrations (maximum of 6490 cfu/100ml) occasionally documented downstream of Gifford Road in 2013.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2394	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary to Bread and Cheese Brook approximately 75 feet downstream/east of Gifford Road, Westport]	41.641806	-71.076457

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP

Undated11) (MassDEP Undated6)

[Result units are CFU/100ml or MPN/100ml]

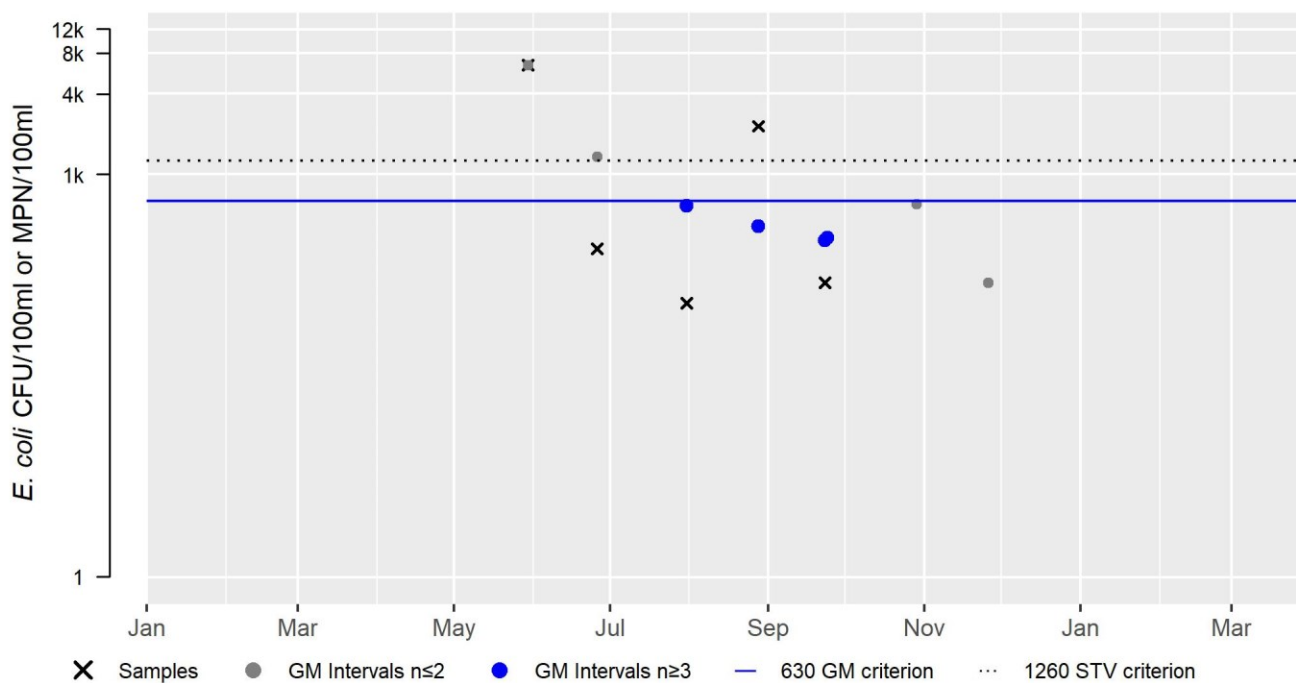
Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
W2394	MassDEP	E. coli	05/30/13	09/23/13	5	110	6490	589

W2394 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	5
SeasGM	589
#GMI	4
#GMI Ex	0
%GMI Ex	0
n>STV	2
%n>STV	40

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

2013

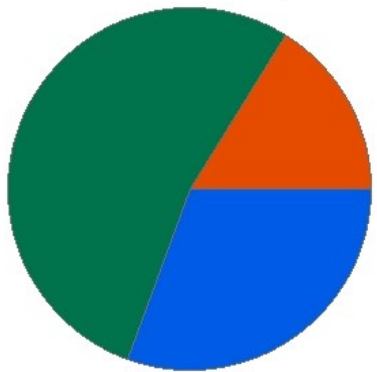


Unnamed Tributary (MA95-80)

Location:	Unnamed tributary to Aucoot Creek, headwaters west of Mill Street (Route 6), Marion to the Marion WWTF (MA0100030) discharge, Marion.
AU Type:	RIVER
AU Size:	0.4 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA95-80

Watershed Area: 0.12 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.12	0.12	0.07	0.07
Agriculture	0%	0%	0%	0%
Developed	16.1%	16.1%	18%	18%
Natural	53.4%	53.4%	49.7%	49.7%
Wetland	30.5%	30.5%	32.4%	32.4%
Impervious Cover	8%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	2	None		Unchanged

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	
<p>Water from this Unnamed Tributary AU (MA95-80) just upstream from the Marion WWTP discharge (approximately 170 feet downstream of Ables Way, Marion) was collected for use as dilution water for the Marion WWTP whole effluent toxicity tests. Between June 2015 and August 2021, survival of <i>C. dubia</i> exposed (7-day) was $\geq 50\%$, (n=23) while survival of <i>P. promelas</i> was $\geq 95\%$, (n=10). There were two tests (May 2020 and May 2021) where survival of <i>C. dubia</i> was $< 75\%$ but all other tests were $\geq 80\%$.</p> <p>The Aquatic Life Use for Unnamed Tributary (MA95-80) will continue to be assessed as Fully Supporting based on the generally good survival of test organisms exposed to water collected at the downstream end of the AU between 2015 and 2021. An Alert is being identified since survival of <i>C. dubia</i> exposed to this Unnamed Tributary was $< 75\%$ in two recent tests.</p>	

*Toxicological Monitoring Information (Ambient, Effluent, Sediment)***Marion WWTF [MA95-80] Ambient testing information summary. (MassDEP Undated9)***Ambient MA95-80*

Water from the unnamed tributary (MA95-80) just upstream from the Marion WWTP discharge (approximately 170 feet downstream of Ables Way, Marion) was collected for use as dilution water for the Marion WWTP whole effluent toxicity tests. Between June 2015 and August 2021, survival of *C. dubia* exposed (7-day) was $\geq 50\%$, (n=23) while survival of *P. promelas* was $\geq 95\%$, (n=10). There were two tests (May 2020 and May 2021) where survival of *C. dubia* was $< 75\%$ but all other tests were $\geq 80\%$.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Unnamed Tributary AU (MA95-80); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Unnamed Tributary AU (MA95-80) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E. coli</i> bacteria data are available to assess the status of the Primary Contact Recreation Use for this Unnamed Tributary AU (MA95-80) so it is Not Assessed.	

Secondary Contact Recreation

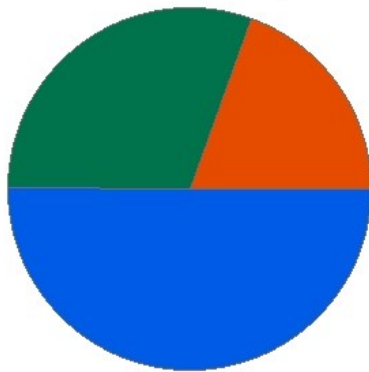
2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E. coli</i> bacteria data are available to assess the status of the Secondary Contact Recreation Use for this Unnamed Tributary AU (MA95-80) so it is Not Assessed.	

Unnamed Tributary (MA95-81)

Location:	Unnamed tributary to Aucoot Creek from the Marion WWTF (MA0100030) discharge, Marion to the boundary of the saltwater wetland, Marion.
AU Type:	RIVER
AU Size:	0.7 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA95-81

Watershed Area: 0.1 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.1	0.1	0.08	0.08
Agriculture	0%	0%	0%	0%
Developed	19.4%	19.4%	13.9%	13.9%
Natural	30.5%	30.5%	24.1%	24.1%
Wetland	50.1%	50.1%	62%	62%
Impervious Cover	10.7%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	3	None		Unchanged

Recommendations

2022 Recommendations

ALU: Monitoring for nutrient enrichment indicators (especially total phosphorus) should be conducted in this Unnamed Tributary (MA95-81) both up and downstream of the Marion WWTP discharge.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Insufficient Information	YES
2022 Use Attainment Summary	

The NPDES Permit (MA0100030) for the Marion WWTP to discharge to Unnamed Tributary (MA95-81), was renewed in April 2017. The discharge limitation and monitoring requirement for toxicity testing remained the same as the prior permit, which became effective in 2007. A total of 37 modified acute and chronic whole effluent toxicity tests were conducted on the Marion WWTP treated effluent between June 2015 and August 2021, using both *C. dubia* and *P. promelas* as test organisms up to the end of 2017 and then just *C. dubia* after that. There was no evidence of acute toxicity to either test species (all LC50s were >100% effluent (n=26 valid tests for *C. dubia* and n=11 valid tests for *P. promelas*) and the ANOEC results were all 100% effluent). Of the 23 valid *C. dubia* and 10 valid *P. promelas* chronic tests, all met the C-NOEC limit of 100% effluent.

Too limited data are available to assess the Aquatic Life Use for this Unnamed Tributary AU (MA95-81) so it is assessed as having Insufficient Information. The previous Alert for elevated Total Phosphorus concentrations at Olde Meadow Road (~1200 feet downstream of Marion WWTF) is being carried forward.

Toxicological Monitoring Information (Ambient, Effluent, Sediment)

Marion WWTF [MA95-81] Whole Effluent Toxicity information summary. (MassDEP Undated9)

The NPDES Permit (MA0100030) for the Marion WWTP to discharge to an unnamed Brook (MA95-81), was renewed in April 2017. The discharge limitation and monitoring requirement for toxicity testing remained the same as the prior permit, which became effective in 2007.

Effluent

A total of 37 modified acute and chronic whole effluent toxicity tests were conducted on the Marion WWTP treated effluent between June 2015 and August 2021, using both *C. dubia* and *P. promelas* as test organisms up to the end of 2017 and then just *C. dubia* after that. There was no evidence of acute toxicity to either test species (all LC50s were >100% effluent (n=26 valid tests for *C. dubia* and n=11 valid tests for *P. promelas* and the ANOEC results were all 100% effluent). Of the 23 valid *C. dubia* and 10 valid *P. promelas* chronic tests, all met the C-NOEC limit of 100% effluent.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Unnamed Tributary (MA95-81); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Unnamed Tributary AU (MA95-81) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E. coli</i> bacteria data are available to assess the Primary Contact Recreational Use for this Unnamed Tributary AU (MA95-81) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment		Alert
Not Assessed		NO
2022 Use Attainment Summary		
No <i>E. coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for this Unnamed Tributary AU (MA95-81) so it is Not Assessed.		

Unnamed Tributary (MA95-84)

Location:	Unnamed tributary to Snell Creek, perennial portion north of Brookwood Drive, Westport to mouth at Snell Creek, Westport.
AU Type:	RIVER
AU Size:	0.8 MILES
Classification/Qualifier:	B

No usable data were available for Unnamed Tributary (MA95-84) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	2	None		Unchanged

Unnamed Tributary (MA95-91)

Location:	Unnamed tributary to Slocums River, perennial portion east of Division Road, Dartmouth to confluence with saltwater portion east of Barneys Joy Road, Dartmouth (referred to as 'Barneys Joy North' in Massachusetts Estuaries Project technical report for Slocums and Little Rivers Embayment System).
AU Type:	RIVER
AU Size:	2.1 MILES
Classification/Qualifier:	B

No usable data were available for Unnamed Tributary (MA95-91) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	3	None		Unchanged

Unnamed Tributary (MA95-92)

Location:	Unnamed tributary to Slocums River, headwaters outlet wetland north of Horseneck Road, Dartmouth to confluence with saltwater portion east of Barneys Joy Road, Dartmouth (referred to as 'Barneys Joy South' in Massachusetts Estuaries Project technical report for Slocums and Little Rivers Embayment System).
AU Type:	RIVER
AU Size:	1.2 MILES
Classification/Qualifier:	B

No usable data were available for Unnamed Tributary (MA95-92) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

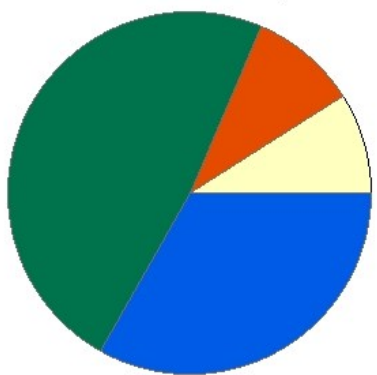
2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	3	None		Unchanged

Unnamed Tributary (MA95-98)

Location:	Unnamed tributary to unnamed tributary to Everett Cove of East Branch Westport River, perennial portion east of Pine Hill Road, Westport to confluence with unnamed tributary west of Pine Hill Road, Westport.
AU Type:	RIVER
AU Size:	1.1 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA95-98

Watershed Area: 0.57 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.57	0.57	0.2	0.2
Agriculture	8.9%	8.9%	13.1%	13.1%
Developed	9.6%	9.6%	4.7%	4.7%
Natural	48.3%	48.3%	32.3%	32.3%
Wetland	33.1%	33.1%	50%	50%
Impervious Cover	3.2%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	2	None		Unchanged

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	
<p>MassDEP staff did not observe any dense film or filamentous algae on the unnamed tributary (locally known as 'Woodland Brook') just south of Pine Hill Rd, Westport (W2366), during summer surveys as part of the MassDEP Bacteria Source Tracking (BST) project, in 2012 and 2013 (n=3) and (n=2) respectively.</p> <p>Too limited data available to assess the Aquatic Life Use for this Unnamed Tributary AU (MA95-98) so it is assessed as having Insufficient Information.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2366	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary (locally known as 'Woodland Brook') to East Branch Westport River, just south of #244 Pine Hill Road, Westport]	41.606213	-71.052229

Physico-chemical Water Quality Information

Nutrients (Primary Producer Screening, Physico-chemical Screening)

MassDEP Nutrient Enrichment Indicator Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	Delta DO Max (mg/L)	Delta DO Avg (mg/L)	DO Sat Max (%)	pH Max (SU)	Count Algal Obsv.	Dense/V. Dense Film/Fila. Algae
W2366	2012	--	--	--	--	--	--	--	--	3	0
W2366	2013	--	--	--	--	--	--	--	--	2	0

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Unnamed Tributary AU (MA95-98); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff conducted field surveys for this Unnamed Tributary AU (locally known as 'Woodland Brook') (MA95-98) just south of #244 Pine Hill Road (W2366) during the summers of 2012 (n=3) and 2013 (n=2), as part of the MassDEP BST Project. There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during either summer.</p> <p>The Aesthetics Use for this Unnamed Tributary AU (MA95-98) is assessed as Fully Supporting since there were generally no objectionable conditions noted by MassDEP staff at the site sampled during the summers of 2012 or 2013.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2366	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary (locally known as 'Woodland Brook') to East Branch Westport River, just south of #244 Pine Hill Road, Westport]	41.606213	-71.052229

Aesthetic Observations

Aesthetics Summary Statements for MassDEP Stations (2011-2018) (MassDEP Undated6)

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W2366	Unnamed Tributary	2012	3	MassDEP aesthetics observations for station W2366 on Unnamed Tributary can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2012.
W2366	Unnamed Tributary	2013	2	MassDEP aesthetics observations for station W2366 on Unnamed Tributary can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2).

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W2366	2012	3	3	0
W2366	2013	2	2	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W2366	Unnamed Tributary	2012	Color	Brownish	1	3
W2366	Unnamed Tributary	2012	Color	Light Yellow/Tan	1	3
W2366	Unnamed Tributary	2012	Color	None	1	3
W2366	Unnamed Tributary	2012	Objectionable Deposits	Not Applicable (N/A)	3	3
W2366	Unnamed Tributary	2012	Odor	None	3	3
W2366	Unnamed Tributary	2012	Scum	Not Applicable (N/A)	3	3
W2366	Unnamed Tributary	2012	Turbidity	Slightly Turbid	3	3
W2366	Unnamed Tributary	2013	Color	Brownish	2	2
W2366	Unnamed Tributary	2013	Objectionable Deposits	Not Applicable (N/A)	2	2
W2366	Unnamed Tributary	2013	Odor	None	2	2
W2366	Unnamed Tributary	2013	Scum	Not Applicable (N/A)	2	2
W2366	Unnamed Tributary	2013	Turbidity	Slightly Turbid	2	2

Primary Contact Recreation

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	
<p>MassDEP staff collected <i>E. coli</i> bacteria samples at this Unnamed Tributary (MA95-98) (locally known as 'Woodland Brook') to East Branch Westport River, just south of #244 Pine Hill Road in Westport (W2366) between June and September 2012 (n=3) and between June and July 2013, as part of the MassDEP BST project (n=2). The available <i>E. coli</i> data at W2366 are too limited to assess the Primary Contact Recreational Use according to the CALM "Use Attainment Impairment Decision Schema", though it should be noted that just one sample in 2012 exceeded the 410 cfu/100 ml STV and the seasonal GM's were 254 cfu/100 ml in 2012 and 42 cfu/100 ml in 2013.</p> <p>Too limited <i>E. coli</i> data are available to assess the Primary Contact Recreational Use for this Unnamed Tributary AU (MA95-98) so it is assessed as having Insufficient Information.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2366	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary (locally known as 'Woodland Brook') to East Branch Westport River, just south of #244 Pine Hill Road, Westport]	41.606213	-71.052229

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP

Undated11) (MassDEP Undated6)

[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
W2366	MassDEP	E. coli	06/20/12	09/24/12	3	166	461	254
W2366	MassDEP	E. coli	06/18/13	07/29/13	2	25	70	42

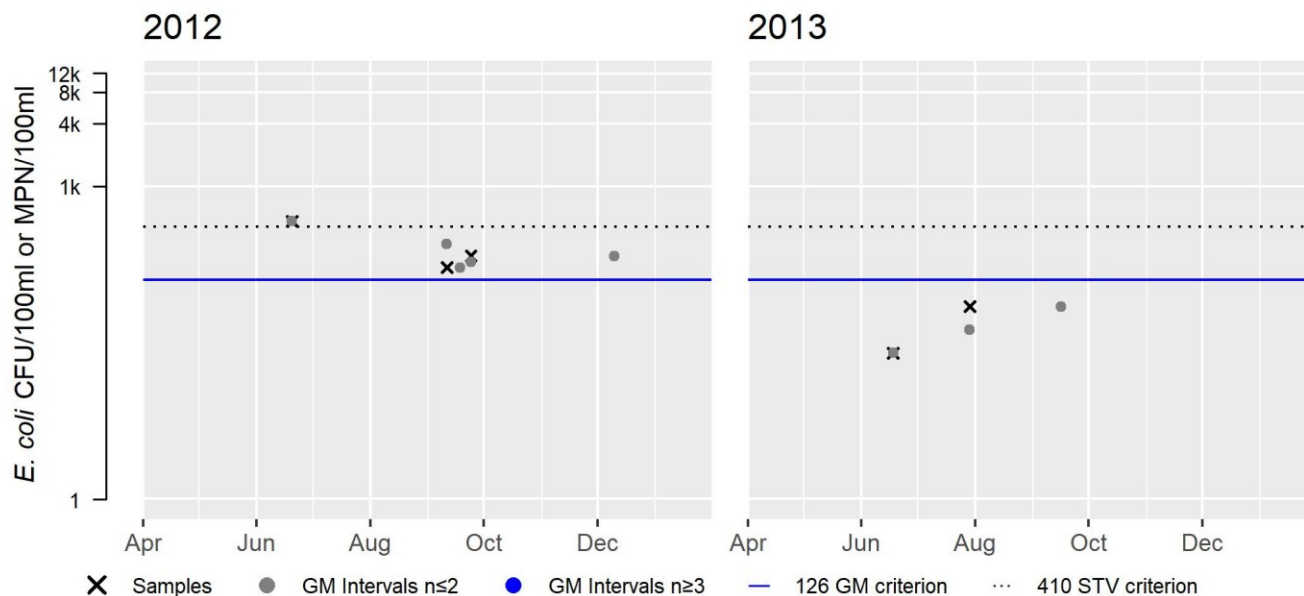
W2366 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	254
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	33

Var	Res
Samples	2
SeasGM	42
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

Variable	Cumulative %GMI Ex (all years)
Result	0



Secondary Contact Recreation

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	
<p>MassDEP staff collected <i>E. coli</i> bacteria samples at this Unnamed Tributary (MA95-98) (locally known as 'Woodland Brook') to East Branch Westport River, just south of #244 Pine Hill Road in Westport (W2366) between June and September 2012 (n=3) and between June and July 2013, as part of the MassDEP BST project (n=2). The available <i>E. coli</i> data at W2366 are too limited to assess the Secondary Contact Recreational Use according to the CALM "Use Attainment Impairment Decision Schema". No samples exceeded the 1260 cfu/100 ml STV and the seasonal GM's were 254 cfu/100 ml in 2012 and 42 cfu/100 ml in 2013.</p> <p>Too limited <i>E. coli</i> data are available to assess the Secondary Contact Recreational Use for this Unnamed Tributary AU (MA95-98) so it is assessed as having Insufficient Information.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2366	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary (locally known as 'Woodland Brook') to East Branch Westport River, just south of #244 Pine Hill Road, Westport]	41.606213	-71.052229

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP

Undated11) (MassDEP Undated6)

[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
W2366	MassDEP	E. coli	06/20/12	09/24/12	3	166	461	254
W2366	MassDEP	E. coli	06/18/13	07/29/13	2	25	70	42

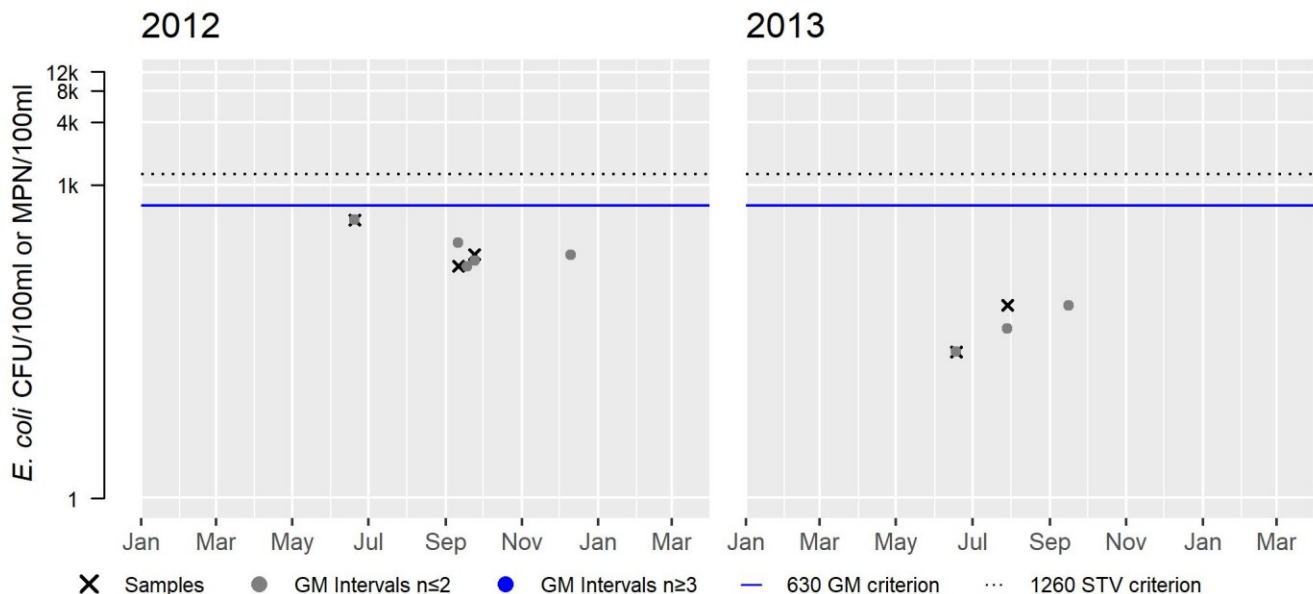
W2366 E. coli (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	254
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Var	Res
Samples	2
SeasGM	42
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

Variable	Cumulative %GMI Ex (all years)
Result	0

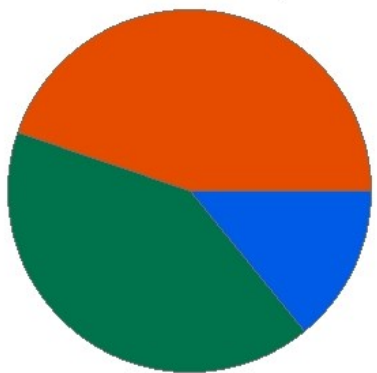


Unnamed Tributary (MA95-99)

Location:	Unnamed tributary to Mattapoisett Harbor, headwaters south of Tower Road, Mattapoisett to mouth at confluence with Mattapoisett Harbor, Mattapoisett (approximately 180 feet near mouth is culverted, from Water Street to western edge of Mattapoisett Town Beach).
AU Type:	RIVER
AU Size:	0.8 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA95-99

Watershed Area: 0.25 square miles



■ Percent Agriculture ■ Percent Natural
■ Percent Developed ■ Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.25	0.25	0.1	0.1
Agriculture	0.7%	0.7%	1.5%	1.5%
Developed	44.4%	44.4%	35.5%	35.5%
Natural	40.9%	40.9%	32.2%	32.2%
Wetland	14%	14%	30.8%	30.8%
Impervious Cover	22.3%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	2	None		Unchanged

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	
<p>MassDEP staff did not observe any dense film or filamentous algae at three locations on the Unnamed Tributary to Mattapoisett Harbor (MA95-99) during summer surveys conducted in 2011, 2012, and 2013 as part of the MassDEP Bacteria Source Tracking (BST) project, from upstream to downstream as follows: Church Street (downstream of road & storm drain) (W2332, n=2 in 2011), Captains Lane (downstream of road & storm drain) (W2333, n=2 in 2011, n=2 in 2012), and at the culvert outlet (to Mattapoisett Harbor) at the western edge of Mattapoisett Town Beach, south off Water Street (W2334, n=1 in 2011, n=1 in 2013).</p> <p>There are too limited data available to assess the Aquatic Life Use for this Unnamed Tributary AU (MA95-99) so it is assessed as having Insufficient Information.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2332	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary to Mattapoisett Harbor, Church Street, Mattapoisett (downstream of road and stormdrain)]	41.660692	-70.810393
W2333	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary to Mattapoisett Harbor, Captains Lane, Mattapoisett (downstream of road and stormdrain)]	41.659781	-70.809958
W2334	MassDEP	Water Quality	Unnamed Tributary	[culvert outlet (to Mattapoisett Harbor) at western edge of Mattapoisett Town Beach, south off Water Street, Mattapoisett (outfall not visible on USGS 1977 Marion quadrangle)]	41.658077	-70.809296

Physico-chemical Water Quality Information

Nutrients (Primary Producer Screening, Physico-chemical Screening)

MassDEP Nutrient Enrichment Indicator Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	Delta DO Max (mg/L)	Delta DO Avg (mg/L)	DO Sat Max (%)	pH Max (SU)	Count Algal Obsv.	Dense/V. Dense Film/Fila. Algae
W2332	2011	--	--	--	--	--	--	--	--	2	0
W2333	2011	--	--	--	--	--	--	--	--	2	0
W2333	2012	--	--	--	--	--	--	--	--	2	0
W2334	2011	--	--	--	--	--	--	--	--	1	0
W2334	2013	--	--	--	--	--	--	--	--	1	0

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Unnamed Tributary (MA95-99); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff conducted surveys as part of the Bacteria Source Tracking (BST) project in this Unnamed Tributary to Mattapoisett Harbor (MA95-99) at three sites during the summers of 2011, 2012, and 2013. The site descriptions from upstream to downstream are as follows: Church Street (downstream of road & storm drain) (W2332, n=2 in 2011), Captains Lane (downstream of road & storm drain) (W2333, n=3 in 2011, n=2 in 2012) and at the culvert outlet (to Mattapoisett Harbor) at the western edge of Mattapoisett Town Beach, south off Water Street (W2334, n=1 in 2011, n=2 in 2013). There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews at any site during any year.</p> <p>The Aesthetics Use of this Unnamed Tributary AU (MA95-99) is assessed as Fully Supporting based on the general lack of objectionable conditions noted by MassDEP staff during surveys conducted during the summers of 2011 through 2013.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2332	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary to Mattapoisett Harbor, Church Street, Mattapoisett (downstream of road and stormdrain)]	41.660692	-70.810393
W2333	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary to Mattapoisett Harbor, Captains Lane, Mattapoisett (downstream of road and stormdrain)]	41.659781	-70.809958
W2334	MassDEP	Water Quality	Unnamed Tributary	[culvert outlet (to Mattapoisett Harbor) at western edge of Mattapoisett Town Beach, south off Water Street, Mattapoisett (outfall not visible on USGS 1977 Marion quadrangle)]	41.658077	-70.809296

*Aesthetic Observations***Aesthetics Summary Statements for MassDEP Stations (2011-2018) (MassDEP Undated6)**

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W2332	Unnamed Tributary	2011	2	MassDEP aesthetics observations for station W2332 on Unnamed Tributary can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2011. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2).
W2333	Unnamed Tributary	2011	3	MassDEP aesthetics observations for station W2333 on Unnamed Tributary can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2011.
W2333	Unnamed Tributary	2012	2	MassDEP aesthetics observations for station W2333 on Unnamed Tributary can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2012. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2).
W2334	Unnamed Tributary	2011	1	MassDEP aesthetics observations for station W2334 on Unnamed Tributary can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2011. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=1).
W2334	Unnamed Tributary	2013	2	MassDEP aesthetics observations for station W2334 on Unnamed Tributary can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2).

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W2332	2011	2	2	0
W2333	2011	3	2	0
W2333	2012	2	2	0
W2334	2011	1	1	0
W2334	2013	2	1	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W2332	Unnamed Tributary	2011	Color	None	2	2
W2332	Unnamed Tributary	2011	Objectionable Deposits	Not Applicable (N/A)	2	2
W2332	Unnamed Tributary	2011	Odor	None	2	2
W2332	Unnamed Tributary	2011	Scum	Not Applicable (N/A)	2	2
W2332	Unnamed Tributary	2011	Turbidity	Slightly Turbid	2	2
W2333	Unnamed Tributary	2011	Color	None	2	3
W2333	Unnamed Tributary	2011	Color	NR	1	3
W2333	Unnamed Tributary	2011	Objectionable Deposits	Not Applicable (N/A)	3	3
W2333	Unnamed Tributary	2011	Odor	None	2	3
W2333	Unnamed Tributary	2011	Odor	NR	1	3
W2333	Unnamed Tributary	2011	Scum	Not Applicable (N/A)	3	3
W2333	Unnamed Tributary	2011	Turbidity	NR	1	3
W2333	Unnamed Tributary	2011	Turbidity	Slightly Turbid	2	3
W2333	Unnamed Tributary	2012	Color	None	2	2
W2333	Unnamed Tributary	2012	Objectionable Deposits	Not Applicable (N/A)	2	2
W2333	Unnamed Tributary	2012	Odor	None	2	2
W2333	Unnamed Tributary	2012	Scum	Not Applicable (N/A)	2	2

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W2333	Unnamed Tributary	2012	Turbidity	Slightly Turbid	2	2
W2334	Unnamed Tributary	2011	Color	None	1	1
W2334	Unnamed Tributary	2011	Objectionable Deposits	Not Applicable (N/A)	1	1
W2334	Unnamed Tributary	2011	Odor	None	1	1
W2334	Unnamed Tributary	2011	Scum	Not Applicable (N/A)	1	1
W2334	Unnamed Tributary	2011	Turbidity	None	1	1
W2334	Unnamed Tributary	2013	Color	None	2	2
W2334	Unnamed Tributary	2013	Objectionable Deposits	Not Applicable (N/A)	2	2
W2334	Unnamed Tributary	2013	Odor	None	2	2
W2334	Unnamed Tributary	2013	Scum	Not Applicable (N/A)	2	2
W2334	Unnamed Tributary	2013	Turbidity	None	1	2
W2334	Unnamed Tributary	2013	Turbidity	Slightly Turbid	1	2

Primary Contact Recreation

2022 Use Attainment	Alert
Insufficient Information	YES
2022 Use Attainment Summary	
<p>MassDEP staff collected <i>E. coli</i> and <i>Enterococci</i> bacteria samples as part of the MassDEP Bacteria Source Tracking (BST) project in this Unnamed Tributary to Mattapoissett Harbor (MA95-99) in Mattapoissett, from upstream to downstream as follows: Church Street (downstream of road & storm drain) (W2332) between June and September 2011 (n=2 <i>E. coli</i>), Captains Lane (downstream of road & storm drain) (W2333) between June and September 2011 (n=2 <i>E. coli</i> & n=1 <i>Enterococcus</i>), between August and September 2012 (n=2 <i>E. coli</i>) and at the culvert outlet (to Mattapoissett Harbor) at the western edge of Mattapoissett Town Beach, south off Water Street (W2334) between June and September 2011 (n=2 <i>E. coli</i>), in September 2011 (n=1 <i>Enterococcus</i>), between August and September 2012 (n=2 <i>E. coli</i>), and between August and October 2013 (n=2 <i>E. coli</i>). Analysis of these low frequency datasets indicated too few samples were collected to evaluate according to the CALM "Use Attainment Impairment Decision Schema" (i.e., 3 samples within a 90-day interval). The seasonal geomeans were as follows: at site W2332 (<i>E. coli</i> 411 cfu/100 ml), at site W2333 (<i>E. coli</i> 251, 308 cfu/100 ml & <i>Enterococcus</i> 450 cfu/100 ml) and at site W2334 (<i>E. coli</i> 409, 224, 203 cfu/100 ml & <i>Enterococcus</i> 294 cfu/100 ml). It should also be noted that a number of samples exceeded the STV for either <i>E. coli</i> (410 cfu/100) or <i>Enterococci</i> (130 cfu/100 ml): one sample at site W2332, one sample during each sampling period at site W2333, and one sample during each sampling period at site W2334 - except for 2013.</p> <p>Too limited bacteria data are available to assess the Primary Contact Recreational Use for this Unnamed Tributary to Mattapoissett Harbor (MA95-99) so it is assessed as having Insufficient Information. An Alert is being identified due to the elevated bacteria concentrations documented throughout the AU by MassDEP staff in 2011-2013.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2332	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary to Mattapoisett Harbor, Church Street, Mattapoisett (downstream of road and stormdrain)]	41.660692	-70.810393
W2333	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary to Mattapoisett Harbor, Captains Lane, Mattapoisett (downstream of road and stormdrain)]	41.659781	-70.809958
W2334	MassDEP	Water Quality	Unnamed Tributary	[culvert outlet (to Mattapoisett Harbor) at western edge of Mattapoisett Town Beach, south off Water Street, Mattapoisett (outfall not visible on USGS 1977 Marion quadrangle)]	41.658077	-70.809296

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP Undated11) (MassDEP Undated6)

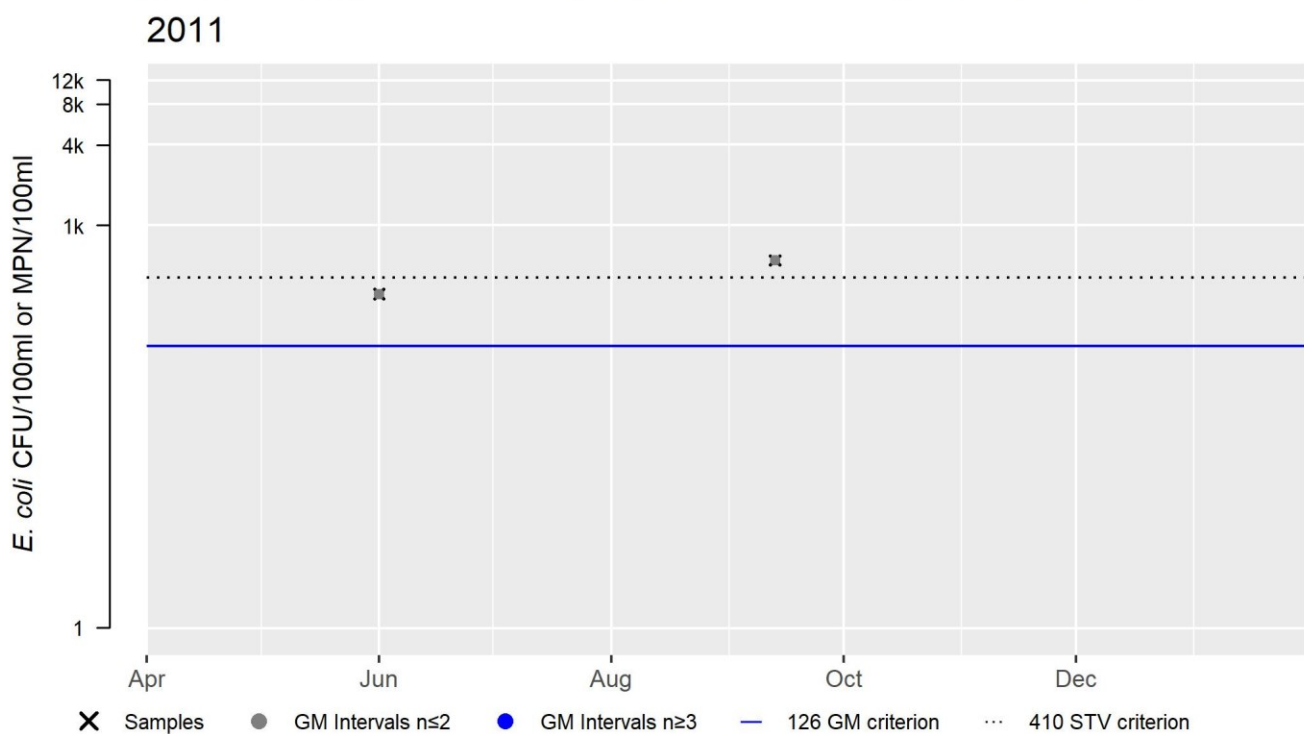
[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
W2332	MassDEP	E. coli	06/01/11	09/13/11	2	308	548	411
W2333	MassDEP	E. coli	06/01/11	09/13/11	2	145	435	251
W2333	MassDEP	Enterococci	09/28/11	09/28/11	1	450	450	450
W2333	MassDEP	E. coli	08/21/12	09/11/12	2	185	512	308
W2334	MassDEP	E. coli	06/01/11	09/13/11	2	326	512	409
W2334	MassDEP	Enterococci	09/13/11	09/13/11	1	294	294	294
W2334	MassDEP	E. coli	08/21/12	09/27/12	2	96	521	224
W2334	MassDEP	E. coli	08/20/13	10/22/13	2	201	205	203

W2332 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	411
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	50

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



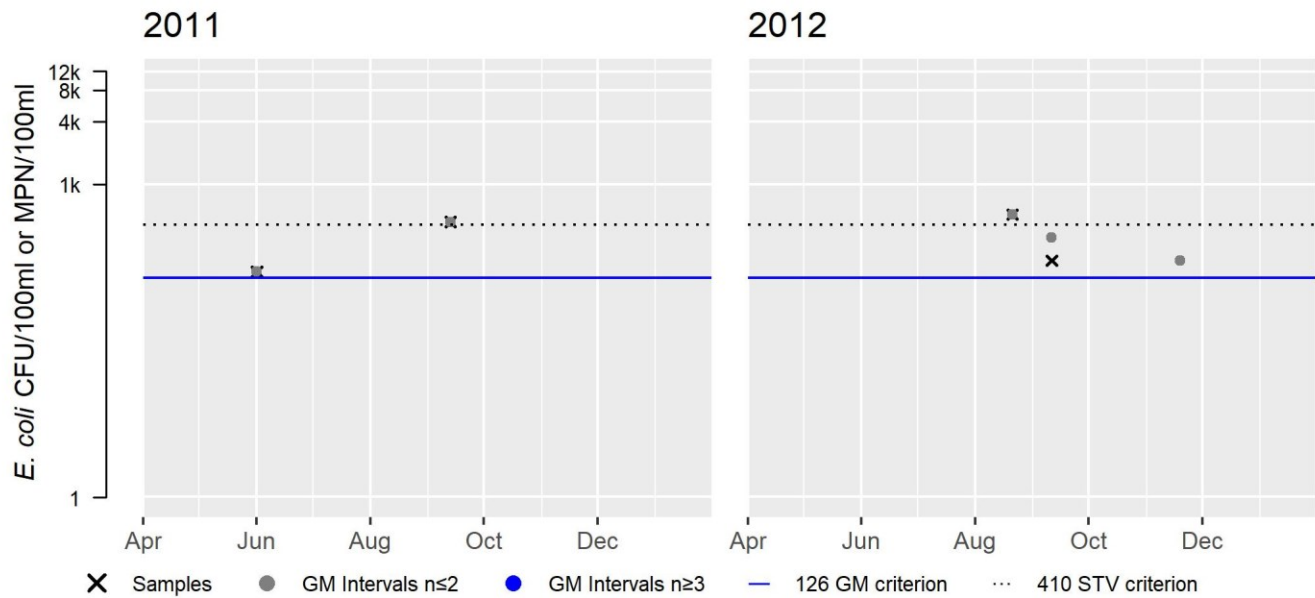
W2333 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	251
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	50

Var	Res
Samples	2
SeasGM	308
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	50

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

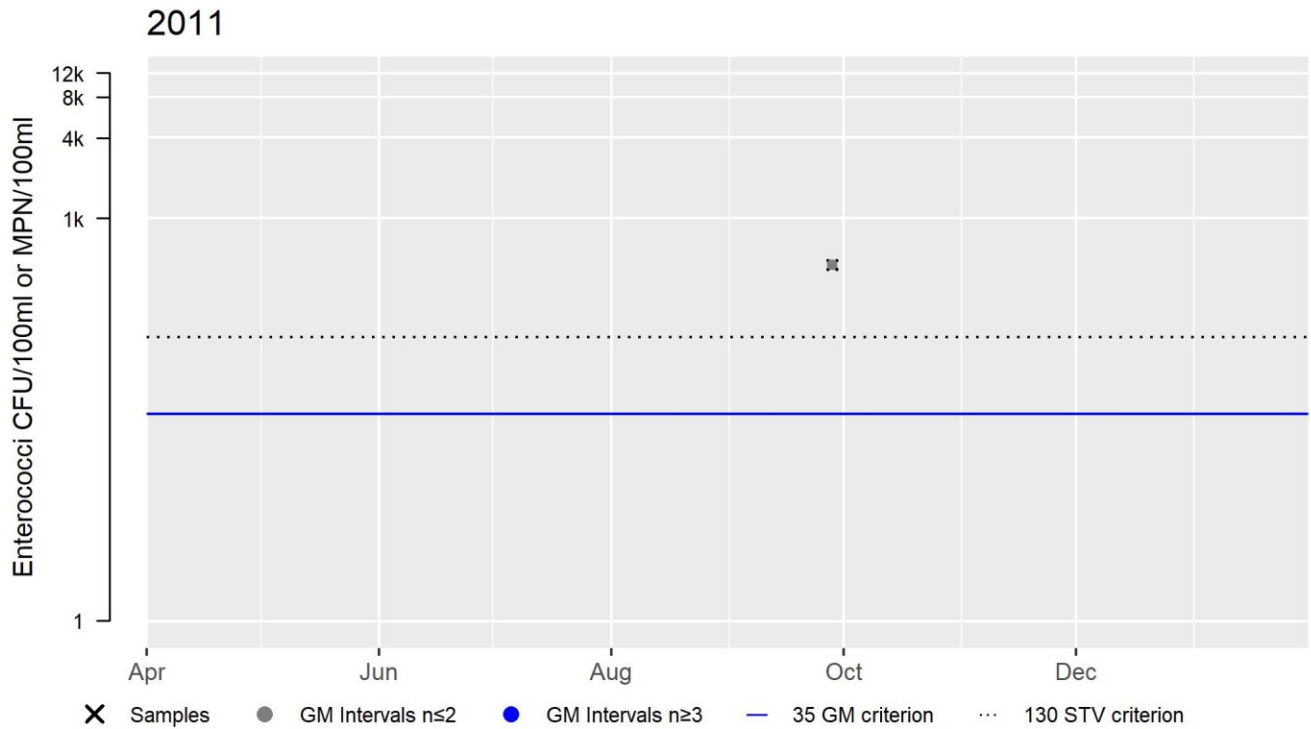
Variable	Cumulative %GMI Ex (all years)
Result	0



W2333 Enterococci (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	1
SeasGM	450
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	100

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2334 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

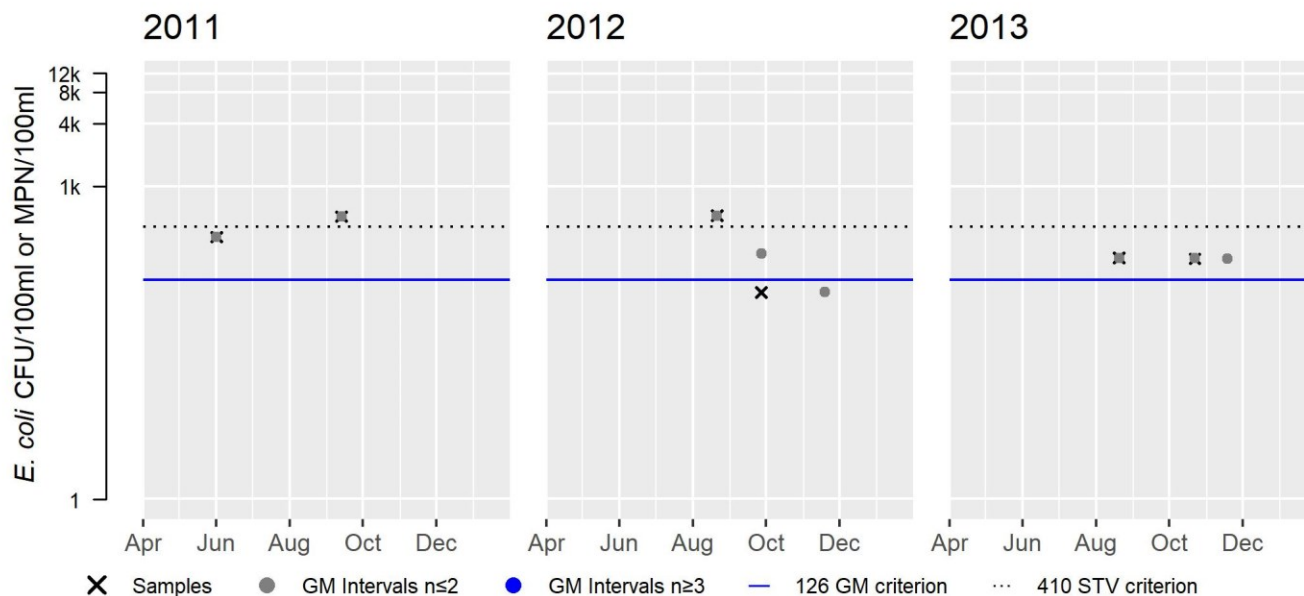
Var	Res
Samples	2
SeasGM	409
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	50

Var	Res
Samples	2
SeasGM	224
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	50

Var	Res
Samples	2
SeasGM	203
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

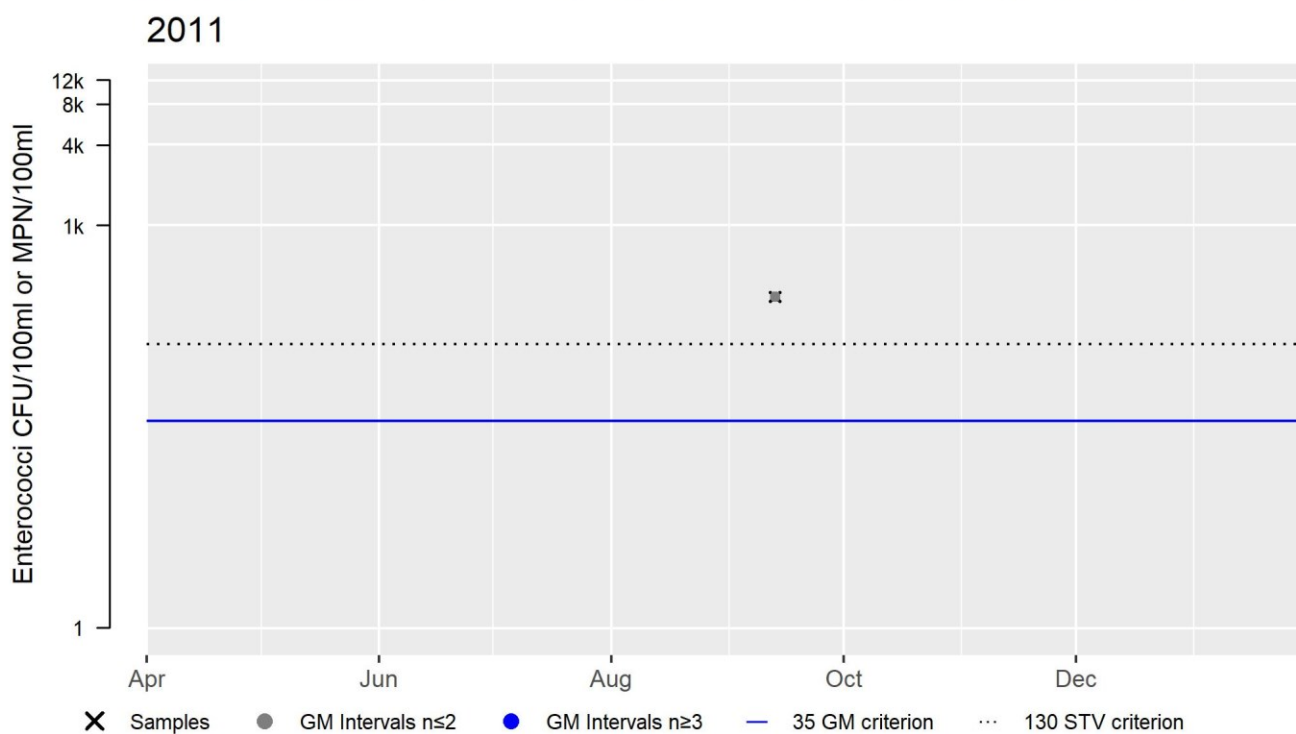
Variable	Cumulative %GMI Ex (all years)
Result	0



W2334 Enterococci (90-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	1
SeasGM	294
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	1
%n>STV	100

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



Secondary Contact Recreation

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	

MassDEP staff collected *E. coli* samples for the MassDEP Bacteria Source Tracking (BST) project in this Unnamed Tributary to Mattapoisett Harbor (MA95-99) in Mattapoisett, from upstream to downstream as follows: Church Street (downstream of road & storm drain) (W2332) between June and September 2011 (n=2), Captains Lane (downstream of road & storm drain) (W2333) between June and September 2011 (n=2), between August and September 2012 (n=2) and at the culvert outlet (to Mattapoisett Harbor) at the western edge of Mattapoisett Town Beach, south off Water Street (W2334) between June and September 2011 (n=2), between August and September 2012 (n=2), and between August and October 2013 (n=2). Analysis of these low frequency datasets indicated too few samples were collected to evaluate according to the CALM "Use Attainment Impairment Decision Schema" (i.e., 3 samples within a 90-day interval). The seasonal geomeans were as follows: at site W2332 (411 cfu/100 ml), at site W2333 (251, 308 cfu/100 ml) and at site W2334 (409, 274, 203 cfu/100 ml). It should also be noted that no samples exceeded the 1260 cfu/100 ml STV. Too limited bacteria data are available to assess the Secondary Contact Recreational Use for this Unnamed Tributary to Mattapoisett Harbor (MA95-99) so it is assessed as having Insufficient Information.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2332	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary to Mattapoisett Harbor, Church Street, Mattapoisett (downstream of road and stormdrain)]	41.660692	-70.810393
W2333	MassDEP	Water Quality	Unnamed Tributary	[unnamed tributary to Mattapoisett Harbor, Captains Lane, Mattapoisett (downstream of road and stormdrain)]	41.659781	-70.809958
W2334	MassDEP	Water Quality	Unnamed Tributary	[culvert outlet (to Mattapoisett Harbor) at western edge of Mattapoisett Town Beach, south off Water Street, Mattapoisett (outfall not visible on USGS 1977 Marion quadrangle)]	41.658077	-70.809296

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP

Undated11) (MassDEP Undated6)

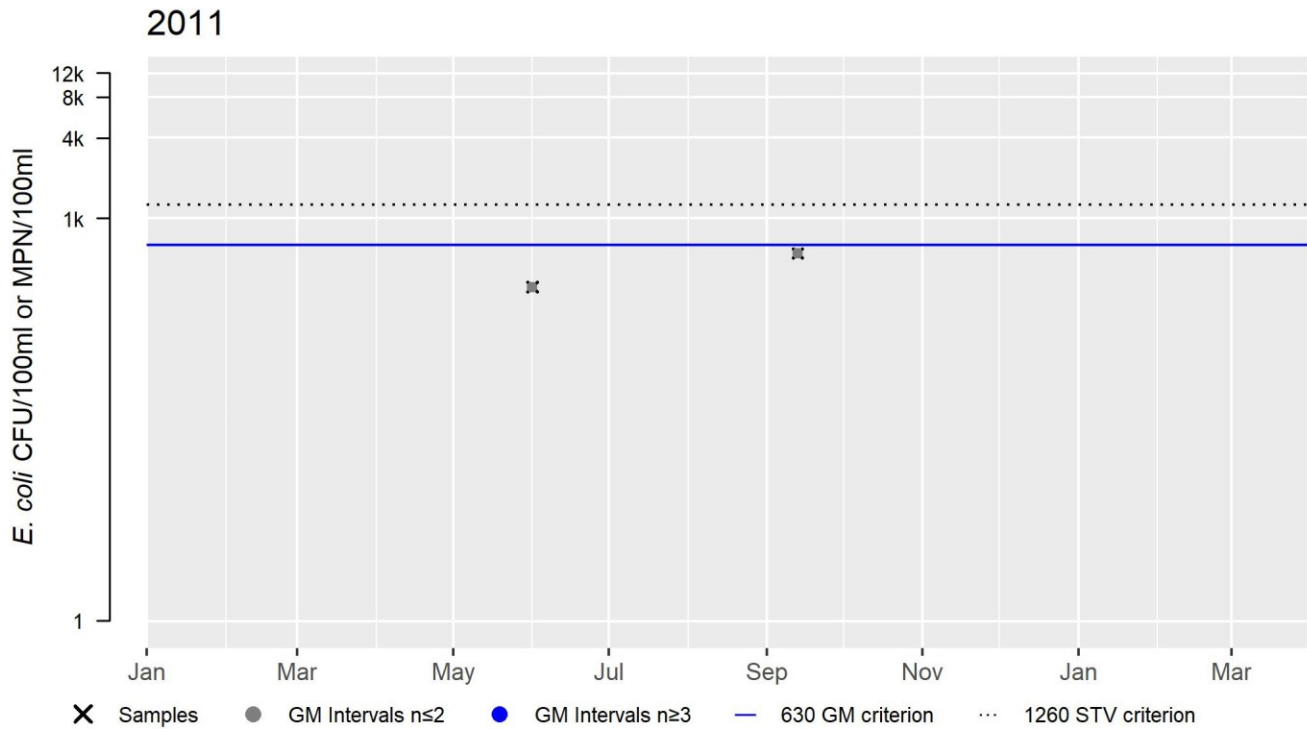
[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
W2332	MassDEP	E. coli	06/01/11	09/13/11	2	308	548	411
W2333	MassDEP	E. coli	06/01/11	09/13/11	2	145	435	251
W2333	MassDEP	E. coli	08/21/12	09/11/12	2	185	512	308
W2334	MassDEP	E. coli	06/01/11	09/13/11	2	326	512	409
W2334	MassDEP	E. coli	08/21/12	11/26/12	3	96	521	274
W2334	MassDEP	E. coli	08/20/13	10/22/13	2	201	205	203

W2332 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	411
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



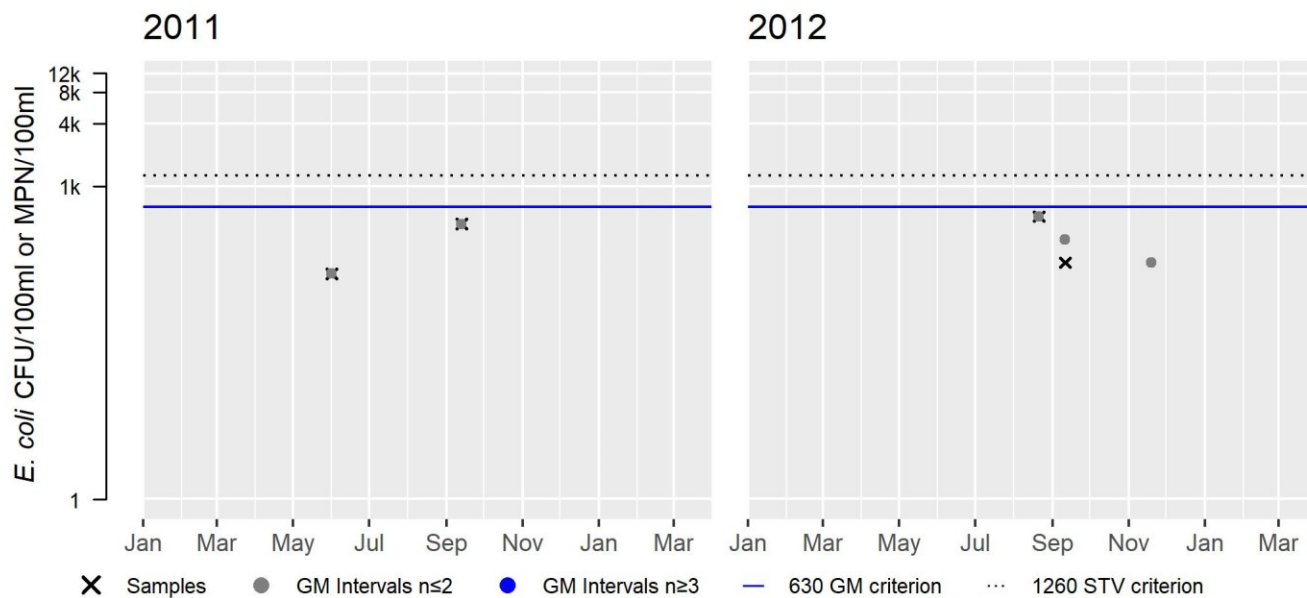
W2333 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	251
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Var	Res
Samples	2
SeasGM	308
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

Variable	Cumulative %GMI Ex (all years)
Result	0



W2334 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

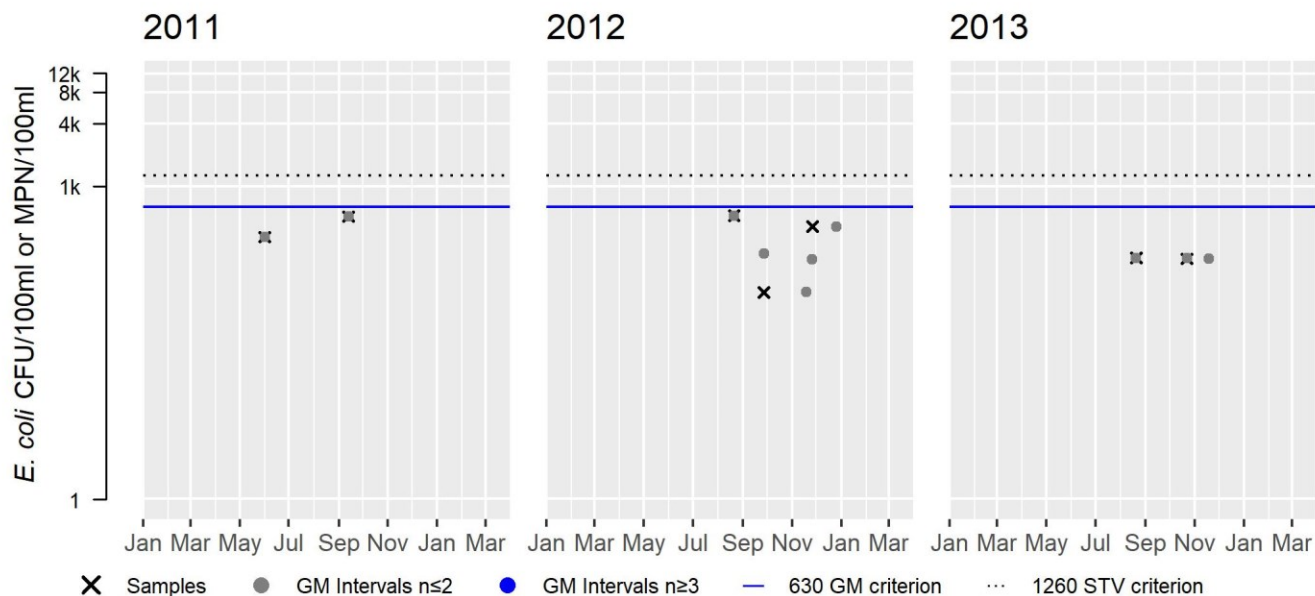
Var	Res
Samples	2
SeasGM	409
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Var	Res
Samples	3
SeasGM	274
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Var	Res
Samples	2
SeasGM	203
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV

Variable	Cumulative %GMI Ex (all years)
Result	0



Vaughn Pond (MA95153)

Location:	Carver.
AU Type:	FRESHWATER LAKE
AU Size:	20 ACRES
Classification/Qualifier:	B

No usable data were available for Vaughn Pond (MA95153) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

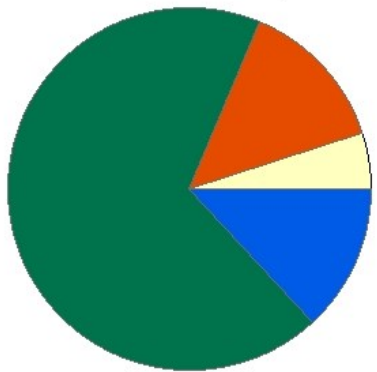
2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Wankinco River (MA95-103)

Location:	From southwestern edge of pond at the outlet of Tihonet Pond #2 Dam (NATID: MA00030), Wareham to inlet of Parker Mills Pond, Wareham.
AU Type:	RIVER
AU Size:	0.3 MILES
Classification/Qualifier:	B

Wankinco River - MA95-103

Watershed Area: 0.33 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.33	0.33	0.22	0.22
Agriculture	5%	5%	7.7%	7.7%
Developed	13.7%	13.7%	13.2%	13.2%
Natural	68.1%	68.1%	61.2%	61.2%
Wetland	13.1%	13.1%	17.9%	17.9%
Impervious Cover	6%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	4c	(Fish Passage Barrier*)		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Hydrostructure Impacts on Fish Passage (Y)	X				

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

DMF biologists note one structure at the upstream end of this Wankinco River AU (MA95-103) causing passage limitation to diadromous fish between the river and the upstream AU (Tihonet Pond MA95146). The Tihonet Pond Dam (NATID# MA00030) (with existing fishway) was given a passage score of "4" on a 0-10 scale (with 10 equating to no possible passage), indicating that the dam restricts the passage of the targeted species, river herring and American eel. The population score in this area was "5". DMF notes an improved outlet was installed at this location in 2010 and a visit was made to the site in 2020 to plan a reconstruction project. The flow from this outlet follows a channel separate to the Wankinco River AU MA95-85 (which lies further east), but also discharges to Parker Mills Pond. The Aquatic Life Use for this Wankinco River AU (MA95-103) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Tihonet Pond Dam. A Fish Passage Barrier impairment is being added.

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note one structure at the upstream end of the Wankinco River AU causing passage limitation to diadromous fish between the river and the upstream AU (Tihonet Pond MA95146). The Tihonet Pond Dam (NATID# MA00030) (with existing fishway) was given a passage score of "4" on a 0-10 scale (with 10 equating to no possible passage), indicating that the dam restricts the passage of the targeted species, river herring and American eel. The population score in this area was noted to be "5". DMF notes an improved outlet was installed at this location in 2010 and a visit was made to the site in 2020 to plan a reconstruction project. The flow from this outlet follows a channel separate to the Wankinco River AU MA95-85 (which lies further east), but also discharges to Parker Mills Pond. The Aquatic Life Use for Wankinco River (Assessment Unit MA95-103) is assessed as Not Supporting based on the barrier to diadromous fish passage at the Tihonet Pond Dam.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Wankinco River AU (MA95-103); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Wankinco River (MA95-103) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E. coli</i> bacteria data are available to assess the Primary Contact Recreational Use for this Wankinco River AU (MA95-103) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E. coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for this Wankinco River AU (MA95-103) so it is Not Assessed.	

Wankinco River (MA95-50)

Location:	From outlet of Parker Mills Pond, south of Elm Street, Wareham to the confluence with the Agawam River (at a line between a point south of Mayflower Ridge Drive and a point north of the railroad tracks near Sandwich Road (forming headwaters of the Wareham River)) just north of Route 6 bridge, Wareham.
AU Type:	ESTUARY
AU Size:	0.05 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	
<p>DMF biologists note one structure at the upstream end of this Wankinco River AU (MA95-50) assisting the passage of diadromous fish between the river and the upstream Parker Mills Pond (AU MA95115): The Parker Mill Dam (NATID# MA00150) (with existing fishway) located at Elm Street in Wareham, was given a passage score of "1" on a 0-10 scale, indicating that the dam is only a minor obstruction to the passage of the targeted fish species, river herring and American eel. The population score was 5. It was further noted by DMF that passage is adequate (via an eel ramp installed in 2009), though active maintenance and bog coordination is needed. Baffle repairs were carried out as recently as 2019.</p> <p>Too limited data are available to assess the Aquatic Life Use for this Wankinco River AU (MA95-50), so it is assessed as having Insufficient Information.</p>	

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary

DMF biologists note one structure at the upstream end of the Wankinco River AU assisting the passage of diadromous fish between the river and the upstream Parker Mills pond. The Parker Mill Dam (NATID# MA00150) (with existing fishway) located at Elm Street in Wareham, was given a passage score of "1" on a 0-10 scale, indicating that the dam is only a minor obstruction to the passage of the targeted fish species, river herring and American eel. The population score was noted to be "5" in this area. It was further noted by DMF that passage is adequate (via an eel ramp installed in 2009), though active maintenance and bog coordination is needed. Baffle repairs were carried out as recently as 2019.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Wankinco River AU (MA95-50); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
Wankinco River (MA95-50): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0453 sq mi (92%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0453 sq mi (92%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB36.3	Wareham River	Prohibited	0.04529	92.2%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Wankinco River AU (MA95-50) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the status of the Primary Contact Recreation Use for this Wankinco River AU (MA95-50) so it is Not Assessed.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)**
(MassDEP Undated8)

Summary
Wankinco River (MA95-50): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0453 sq mi (92%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the status of the Secondary Contact Recreation Use for this Wankinco River AU (MA95-50) so it is Not Assessed.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)**
(MassDEP Undated8)

Summary
Wankinco River (MA95-50): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0453 sq mi (92%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Wankinco River (MA95-85)

Location:	From southeastern edge of pond at the outlet of Tihonet Pond #1 Dam (NATID: MA00029), Wareham to the inlet of Parker Mills Pond, Wareham (formerly part of 2014 segment: Wankinco River MA95-30).
AU Type:	RIVER
AU Size:	0.7 MILES
Classification/Qualifier:	B

No usable data were available for Wankinco River (MA95-85) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

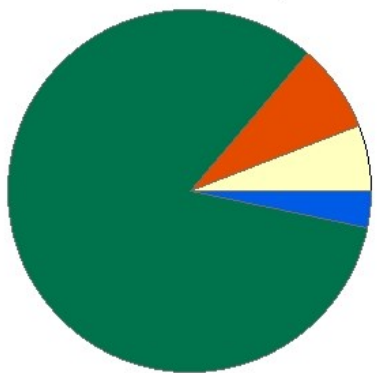
2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Wankinco River (MA95-86)

Location:	Headwaters, outlet East Head Pond, Carver/Plymouth (follows border through cranberry bogs to inlet Tihonet Pond, Carver/Plymouth (formerly part of 2014 segment: Wankinco River MA95-30).
AU Type:	RIVER
AU Size:	3.6 MILES
Classification/Qualifier:	B

WANKINCO RIVER - MA95-86

Watershed Area: 7.68 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	7.68	3.16	2.71	1.77
Agriculture	5.9%	14.5%	16.1%	24.5%
Developed	7.8%	12.3%	11.2%	14.1%
Natural	83.1%	66.9%	66.9%	54.1%
Wetland	3.2%	6.3%	5.8%	7.3%
Impervious Cover	2.2%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	4c	(Fish Passage Barrier*)		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Hydrostructure Impacts on Fish Passage (Y)	X				

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	

DMF biologists note one structure causing passage limitation to diadromous fish at the downstream end of this Wankinco River AU (MA95-86). A bog impoundment (locally known as Wankinco River Pond), was given a passage score of "4" on a 0-10 scale, indicating that the impoundment restricts the passage of the targeted fish species, river herring and American eel. The population score was "4".

The Aquatic Life Use for this Wankinco River AU (MA95-86) is assessed as Not Supporting based on the barrier to diadromous fish passage at the bog impoundment locally known as Wankinco River Pond. A fish Passage Barrier impairment is being added. The prior Alert associated with flow concerns related to cranberry bog operations is being carried forward.

Biological Monitoring Information

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note one structure causing passage limitation to diadromous fish at the downstream end of this Wankinco River AU. A bog impoundment (locally known as Wankinco River Pond), was given a passage score of "4" on a 0-10 scale, indicating that the dam restricts the passage of the targeted fish species, river herring and American eel. The population score was noted to be "4". The Aquatic Life Use for Wankinco River (Assessment Unit MA95-86) is assessed as Not Supporting based on the barrier to diadromous fish passage at the bog impoundment locally known as Wankinco River Pond.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Wankinco River AU (MA95-86); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for this Wankinco River AU (MA95-86) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E. coli</i> bacteria data are available to assess the Primary Contact Recreational Use for this Wankinco River AU (MA95-86) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E. coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for this Wankinco River AU (MA95-86) so it is Not Assessed.	

Wareham River (MA95-03)

Location:	From confluence of Wankinko and Agawam Rivers at Route 6 bridge, Wareham to Buzzards Bay (at an imaginary line from Cromeset Point to curved point east/southeast of Long Beach Point), Wareham. Including Marks Cove, Wareham.
AU Type:	ESTUARY
AU Size:	1.18 SQUARE MILES
Classification/Qualifier:	SA: SFO, HQW

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Chlorophyll-a		Added
5	5	Estuarine Bioassessments		Unchanged
5	5	Fecal Coliform	36172	Unchanged
5	5	Nitrogen, Total		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Chlorophyll-a	Agriculture (Y)	X					
Chlorophyll-a	Municipal Point Source Discharges (Y)	X					
Chlorophyll-a	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Estuarine Bioassessments	Agriculture (Y)	X					
Estuarine Bioassessments	Municipal Point Source Discharges (Y)	X					
Estuarine Bioassessments	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Agriculture (Y)	X					
Nitrogen, Total	Municipal Point Source Discharges (Y)	X					
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					

Recommendations

2022 Recommendations
ALU: Conduct DO monitoring throughout the water column in the open waters (away from shore), to better evaluate the nature and extent of possible low DO impairments for this Wareham River AU (MA95-03).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
<p>The MassDEP Eelgrass Mapping Project documented an increase (~374%) in eelgrass bed habitat in the Wareham River between 1995 and 2017 (0.002 miles² to 0.08 miles², respectively). Additional eelgrass bed mapping data from 1988 in this area, however, show large area of beds in the lower portion of the river (seaward from the confluence with Broad Marsh and Crooked rivers) and in Marks Cove reach areas that currently have not reestablished (MassDEP 2022). The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at thirteen locations throughout the Wareham River, Wareham/Marion (MA95-03) in the summers of 2015-2019, from up to downstream in three general reaches as follows: In the inner reach (upstream of confluence with Crooked River) BBC_WR1X, WR1N, WR2X, WR2N, WR3X, WR3N, WR4, and WR5; in the outer reach (downstream of Crooked River) BBC_WR6 and WR7, and in Marks Cove reach inner to outer, BBC_MC1, MC2, and MC3. Some sample stations were close to shore (from beaches or docks) and others further from shore though usually not “mid-channel”. Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column (at average sample depths ranging from 0.6 to 3.7m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature (monitored at all stations) was 29.4°C (n=1342). The minimum dissolved oxygen (DO) (monitored only in Marks Cove) was 4.1 mg/L (n=222); <6.0mg/L 53 times (24% of all measurements) at a variety of depths including the surface and <5.0mg/L only eight times (~4% of all measurements). Total nitrogen (TN) sampling efforts (n=104, maximum 0.68mg/L at BBC_WR6 in 2018) during ebb tides in July and August documented seasonal average total nitrogen concentrations (data most often for the upper section of the AU) between 0.28-0.58mg/L. The draft TMDL targets in the vicinity of sampling station BBC_WR2 is 0.5mg/L TN with slightly lower targets further downstream/seaward (0.42 and 0.4mg/L TN at sampling stations BBC_WR3 and WR6, respectively) (MassDEP 2022). The 0.4mg/L threshold was exceeded 13 times between 2015-2019 (comparisons not made to each sentinel site). The maximum chlorophyll <i>a</i> was 24.74µg/L (n=243), >5µg/L 196 times and >10µg/L 43 times (18%) most often in the inner reach area. Secchi disk depths ranged from 0.5 to 3.2m (n=505), with yearly averages of 1.0-2.1m. Ammonia-nitrogen concentrations were generally low, (range 0.004 to 0.09mg/L (n=242)), though TUs could not be calculated (lack of quality assured pH and salinity data).</p> <p>Although eelgrass bed habitat has expanded in the upper area of the Wareham River (MA95-39), beds have not yet expanded into the lower reach or Marks Cove area at this time so the Aquatic Life Use will continue to be assessed as Not Supporting based on these data as well as the water quality data collected by the BBC staff/volunteers in 2015-2019. Both the Estuarine Bioassessment and Total Nitrogen impairments are being carried forward. A Chlorophyll <i>a</i> impairment is also being added and an Alert is being identified for slightly low DO documented by BBC in the Marks Cove reach of the river. According to the draft TMDL most of the total N load (43%) is from septic systems, with other “controllable” N contributions coming from fertilizers (20%), WWTF discharge (16%), and runoff of impervious surfaces (11%) (MassDEP 2022).</p>	

Monitoring Stations

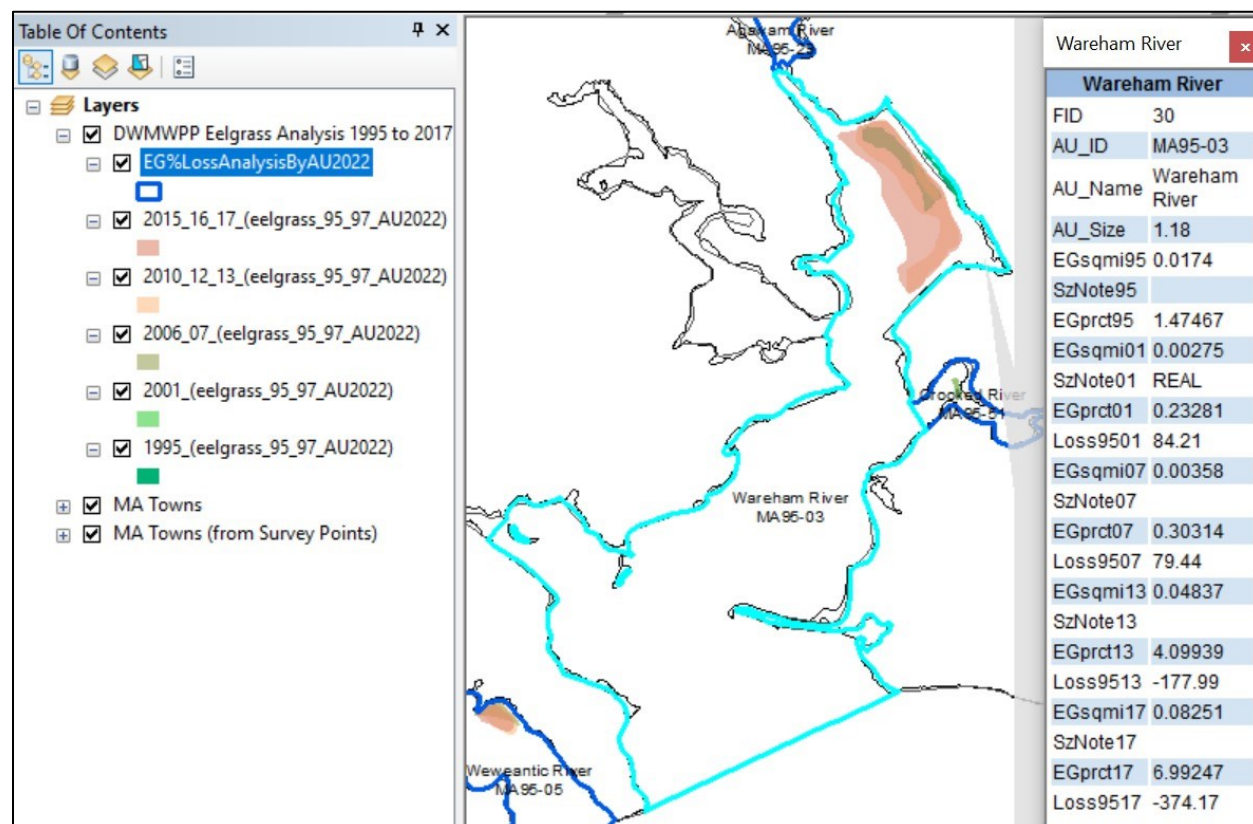
Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_MC1	Buzzards Bay Coalition	Water Quality	Marks Cove	Marks Cove, Wareham	41.73566	-70.726928
BBC_MC2	Buzzards Bay Coalition	Water Quality	Marks Cove	Marks Cove, Wareham	41.732695	-70.724327
BBC_MC3	Buzzards Bay Coalition	Water Quality	Marks Cove	Marks Cove, Wareham	41.728902	-70.721652
BBC_WR1N	Buzzards Bay Coalition	Water Quality	Wareham River	Wareham River Inner, Wareham	41.754108	-70.709363
BBC_WR1X	Buzzards Bay Coalition	Water Quality	Wareham River	Wareham River Inner, Wareham	41.755856	-70.711962
BBC_WR2N	Buzzards Bay Coalition	Water Quality	Wareham River	Wareham River Inner, Wareham	41.753246	-70.707537

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_WR2X	Buzzards Bay Coalition	Water Quality	Wareham River	Wareham River Inner, Wareham	41.75299	-70.708553
BBC_WR3N	Buzzards Bay Coalition	Water Quality	Wareham River	Wareham River Inner, Wareham	41.748726	-70.701181
BBC_WR3X	Buzzards Bay Coalition	Water Quality	Wareham River	Wareham River Inner, Wareham	41.750017	-70.701048
BBC_WR4	Buzzards Bay Coalition	Water Quality	Wareham River	Wareham River Inner, Marion/Wareham	41.74793	-70.709721
BBC_WR5	Buzzards Bay Coalition	Water Quality	Wareham River	Wareham River Inner, Marion/Wareham	41.744951	-70.706268
BBC_WR6	Buzzards Bay Coalition	Water Quality	Wareham River	Wareham River Outer, Wareham	41.740175	-70.706363
BBC_WR7	Buzzards Bay Coalition	Water Quality	Wareham River	Wareham River Outer, Wareham	41.73383	-70.711128

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for the Wareham River MA95-03 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an increase in eelgrass bed habitat in the Wareham River between 1995 and 2017 (0.002 miles² to 0.08 miles², respectively).

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_MC1	07/13/15	08/25/15	0.2	3	6.0	6.5	0	0	0
BBC_MC1	07/13/15	08/25/15	1.2	3	6.1	6.2	0	0	0
BBC_MC1	07/05/16	08/15/16	0.2	4	5.7	6.5	25	0	0
BBC_MC1	08/03/17	08/17/17	0.2	2	5.3	5.6	50	0	0
BBC_MC1	07/10/18	08/21/18	0.2	4	6.0	6.5	0	0	0
BBC_MC1	07/10/18	08/21/18	0.8	4	5.3	6.0	25	0	0
BBC_MC1	07/25/19	08/15/19	0.2	3	5.2	6.1	67	0	0
BBC_MC1	08/08/19	08/15/19	0.9	2	5.2	6.4	50	0	0
BBC_MC2	06/03/15	09/23/15	0.2	21	6.0	6.8	0	0	0
BBC_MC2	06/03/15	09/23/15	1.7	21	5.2	6.4	29	0	0
BBC_MC2	06/05/16	09/23/16	0.2	18	4.1	6.4	17	17	0
BBC_MC2	06/05/16	09/23/16	1.5	14	4.6	6.1	43	14	0
BBC_MC2	06/07/17	09/12/17	0.2	19	6.2	7.1	0	0	0
BBC_MC2	06/07/17	09/01/17	1.2	16	5.7	6.6	25	0	0
BBC_MC2	05/31/18	09/18/18	0.2	23	5.3	6.6	17	0	0
BBC_MC2	05/31/18	09/18/18	1.3	23	4.3	6.1	43	9	0
BBC_MC2	06/26/19	09/15/19	0.3	11	5.2	6.5	27	0	0
BBC_MC2	06/26/19	09/15/19	1.1	7	5.6	6.4	29	0	0
BBC_MC3	07/13/15	08/25/15	0.2	3	6.2	6.6	0	0	0
BBC_MC3	07/13/15	08/25/15	3.5	3	5.4	6.3	33	0	0
BBC_MC3	07/05/16	08/15/16	0.2	4	4.2	6.3	25	25	0
BBC_MC3	08/03/17	08/17/17	0.2	2	6.7	6.9	0	0	0
BBC_MC3	07/10/18	08/21/18	0.2	3	6.2	6.5	0	0	0
BBC_MC3	07/10/18	08/21/18	1.6	3	6.4	6.5	0	0	0
BBC_MC3	07/11/19	08/15/19	0.2	4	6.0	6.6	0	0	0
BBC_MC3	08/08/19	08/15/19	0.9	2	5.9	6.5	50	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_MC1	07/13/15	08/25/15	0.2	3	3	26.0	24.8	0
BBC_MC1	07/13/15	08/25/15	1.2	3	3	26.1	24.8	0
BBC_MC1	07/05/16	08/15/16	0.2	4	4	27.7	25.8	0
BBC_MC1	07/06/17	08/17/17	0.2	4	4	26.5	24.7	0
BBC_MC1	07/10/18	08/21/18	0.2	4	4	27.8	25.6	0
BBC_MC1	07/10/18	08/21/18	0.8	4	4	28.8	26.0	0
BBC_MC1	07/25/19	08/15/19	0.2	3	3	25.3	24.8	0
BBC_MC1	08/08/19	08/15/19	0.9	2	2	25.3	24.8	0
BBC_MC2	06/03/15	09/23/15	0.2	21	19	26.5	23.5	0
BBC_MC2	06/03/15	09/23/15	1.7	21	19	26.8	23.4	0
BBC_MC2	06/05/16	09/23/16	0.2	22	19	27.6	23.8	0
BBC_MC2	06/05/16	09/23/16	1.5	18	15	26.8	23.3	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_MC2	06/07/17	09/12/17	0.2	21	21	26.3	22.4	0
BBC_MC2	06/07/17	09/01/17	1.2	16	16	25.6	21.9	0
BBC_MC2	05/31/18	09/18/18	0.2	23	20	28.7	24.2	0
BBC_MC2	05/31/18	09/18/18	1.3	23	20	28.7	24.0	0
BBC_MC2	06/26/19	09/15/19	0.3	11	11	25.6	23.1	0
BBC_MC2	06/26/19	09/15/19	1.1	7	7	25.3	23.1	0
BBC_MC3	07/13/15	08/25/15	0.2	3	3	25.8	24.9	0
BBC_MC3	07/13/15	08/25/15	3.5	3	3	25.3	24.7	0
BBC_MC3	07/05/16	08/15/16	0.2	4	4	28.0	26.1	0
BBC_MC3	07/06/17	08/17/17	0.2	4	4	26.6	24.8	0
BBC_MC3	07/10/18	08/21/18	0.2	3	3	26.4	24.9	0
BBC_MC3	07/10/18	08/21/18	1.6	3	3	25.9	24.8	0
BBC_MC3	07/11/19	08/15/19	0.2	4	4	25.8	25.1	0
BBC_MC3	08/08/19	08/15/19	0.9	2	2	25.5	25.1	0
BBC_WR1N	07/13/15	08/25/15	0.2	3	3	25.9	25.1	0
BBC_WR1N	07/13/15	08/25/15	2.8	3	3	26.1	25.1	0
BBC_WR1N	07/05/16	08/15/16	0.2	4	4	29.3	27.2	0
BBC_WR1N	07/05/16	08/15/16	2.8	4	4	29.4	26.4	0
BBC_WR1N	07/06/17	08/17/17	0.2	4	4	27.4	25.7	0
BBC_WR1N	07/06/17	08/17/17	2.1	4	4	26.5	25.4	0
BBC_WR1N	07/10/18	08/21/18	0.2	4	4	28.4	26.0	0
BBC_WR1N	07/10/18	08/21/18	3.1	4	4	28.1	25.8	0
BBC_WR1N	07/25/19	08/15/19	0.2	3	3	25.6	24.9	0
BBC_WR1N	07/25/19	08/15/19	2.0	3	3	25.7	25.0	0
BBC_WR1X	05/28/15	09/24/15	0.2	22	19	27.0	22.2	0
BBC_WR1X	05/28/15	09/24/15	2.4	22	19	27.0	22.6	0
BBC_WR1X	06/06/16	09/21/16	0.2	20	17	27.1	23.2	0
BBC_WR1X	06/10/16	09/21/16	2.3	18	15	27.2	23.5	0
BBC_WR1X	05/30/17	09/20/17	0.2	16	14	27.4	22.1	0
BBC_WR1X	05/30/17	09/20/17	2.5	14	12	27.2	22.7	0
BBC_WR1X	05/30/18	09/05/18	0.2	19	18	27.0	23.8	0
BBC_WR1X	06/04/18	09/05/18	2.3	18	18	27.0	24.2	0
BBC_WR1X	05/30/19	09/23/19	0.2	21	18	26.1	22.6	0
BBC_WR1X	05/30/19	09/23/19	1.9	21	18	27.0	22.8	0
BBC_WR2N	07/13/15	08/25/15	0.2	3	3	25.9	25.1	0
BBC_WR2N	07/13/15	08/25/15	3.7	3	3	26.0	24.9	0
BBC_WR2N	07/05/16	08/15/16	0.2	4	4	29.0	27.1	0
BBC_WR2N	07/06/17	08/17/17	0.2	4	4	27.4	25.7	0
BBC_WR2N	07/10/18	08/21/18	0.1	4	4	28.5	26.0	0
BBC_WR2N	07/10/18	08/21/18	2.1	4	4	28.0	25.9	0
BBC_WR2N	07/11/19	08/15/19	0.2	4	4	26.3	25.3	0
BBC_WR2N	07/25/19	08/15/19	1.4	3	3	25.6	25.0	0
BBC_WR2X	05/28/15	12/09/15	0.2	28	21	26.4	23.0	0
BBC_WR2X	05/28/15	12/09/15	2.3	26	20	26.0	22.7	0
BBC_WR2X	01/06/16	09/26/16	0.2	30	20	26.0	22.3	0
BBC_WR2X	04/04/16	09/26/16	2.0	30	21	26.0	22.4	0
BBC_WR2X	01/09/17	09/21/17	0.2	29	22	27.0	22.1	0
BBC_WR2X	01/09/17	09/21/17	2.3	27	21	27.0	22.3	0
BBC_WR2X	05/30/18	09/19/18	0.2	21	19	27.0	23.3	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_WR2X	05/30/18	09/19/18	2.2	21	19	27.0	23.2	0
BBC_WR2X	05/31/19	09/23/19	0.2	22	19	28.0	23.5	0
BBC_WR2X	05/31/19	09/23/19	2.3	22	19	28.0	23.6	0
BBC_WR3N	07/13/15	08/25/15	0.2	3	3	25.7	24.8	0
BBC_WR3N	07/13/15	08/25/15	1.7	3	3	27.7	25.7	0
BBC_WR3N	07/05/16	08/15/16	0.2	4	4	28.6	26.9	0
BBC_WR3N	07/06/17	08/17/17	0.1	4	4	27.3	25.5	0
BBC_WR3N	07/10/18	08/21/18	0.2	4	4	28.6	26.0	0
BBC_WR3N	07/10/18	08/21/18	0.7	4	4	28.8	26.1	0
BBC_WR3N	07/11/19	08/15/19	0.2	4	4	26.3	25.2	0
BBC_WR3N	08/08/19	08/15/19	0.6	2	2	25.5	25.2	0
BBC_WR3X	06/04/15	09/23/15	0.2	21	19	26.6	22.2	0
BBC_WR3X	05/28/15	09/23/15	1.6	17	14	27.0	22.9	0
BBC_WR3X	06/01/16	09/25/16	0.2	23	20	28.0	23.8	0
BBC_WR3X	06/01/16	09/17/16	1.7	20	19	27.0	23.9	0
BBC_WR3X	06/21/17	09/20/17	0.2	12	11	27.1	22.8	0
BBC_WR3X	06/21/17	09/20/17	1.4	11	10	24.3	22.6	0
BBC_WR3X	05/31/18	08/21/18	1.2	10	9	22.2	20.3	0
BBC_WR3X	06/11/19	09/17/19	0.2	6	5	25.4	23.3	0
BBC_WR3X	06/11/19	09/17/19	1.4	6	5	26.0	23.4	0
BBC_WR4	06/10/15	08/25/15	0.2	4	4	25.8	23.5	0
BBC_WR4	06/10/15	08/25/15	1.1	4	4	26.1	23.6	0
BBC_WR4	07/05/16	08/15/16	0.2	4	4	28.6	26.8	0
BBC_WR4	07/06/17	08/17/17	0.2	4	4	27.3	25.2	0
BBC_WR4	07/10/18	08/21/18	0.1	5	5	28.8	26.5	0
BBC_WR4	07/10/18	08/21/18	1.7	3	3	26.7	25.5	0
BBC_WR4	07/11/19	08/15/19	0.2	4	4	26.2	25.3	0
BBC_WR4	08/08/19	08/15/19	0.7	2	2	25.5	25.1	0
BBC_WR5	06/03/15	12/09/15	0.2	28	22	26.9	23.6	0
BBC_WR5	06/03/15	12/09/15	3.3	23	19	26.9	23.7	0
BBC_WR5	01/06/16	09/26/16	0.2	30	22	28.5	23.9	0
BBC_WR5	03/08/16	09/23/16	2.9	21	15	27.2	23.5	0
BBC_WR5	01/09/17	09/18/17	0.2	26	23	27.3	22.3	0
BBC_WR5	01/09/17	09/12/17	1.7	19	17	26.7	22.2	0
BBC_WR5	05/31/18	09/18/18	0.2	23	21	28.6	24.1	0
BBC_WR5	05/31/18	09/18/18	1.8	23	21	28.1	24.0	0
BBC_WR5	06/26/19	09/15/19	0.3	11	11	27.6	24.4	0
BBC_WR5	06/26/19	09/15/19	1.4	9	9	25.9	23.9	0
BBC_WR6	06/03/15	09/23/15	0.2	21	19	26.9	23.7	0
BBC_WR6	06/03/15	09/23/15	1.5	21	19	26.7	23.7	0
BBC_WR6	06/05/16	09/23/16	0.2	22	19	28.6	24.2	0
BBC_WR6	06/05/16	09/23/16	1.3	18	15	27.0	23.5	0
BBC_WR6	06/07/17	09/12/17	0.2	21	21	27.0	22.7	0
BBC_WR6	06/07/17	09/01/17	0.9	16	16	26.6	22.2	0
BBC_WR6	05/31/18	09/18/18	0.2	23	21	28.8	24.0	0
BBC_WR6	05/31/18	09/18/18	0.9	23	21	28.3	24.3	0
BBC_WR6	07/01/19	09/15/19	0.3	10	10	27.3	24.6	0
BBC_WR6	06/26/19	09/15/19	1.5	8	8	25.6	23.6	0
BBC_WR7	06/03/15	09/23/15	0.2	22	20	26.8	23.6	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_WR7	06/03/15	09/23/15	1.5	20	18	26.9	23.4	0
BBC_WR7	06/05/16	09/23/16	0.2	22	19	28.0	24.0	0
BBC_WR7	06/05/16	09/23/16	1.2	18	15	26.6	23.3	0
BBC_WR7	06/07/17	09/12/17	0.2	21	21	26.6	22.6	0
BBC_WR7	06/07/17	09/12/17	1.4	17	17	26.3	22.0	0
BBC_WR7	05/31/18	09/18/18	0.1	24	21	28.5	23.8	0
BBC_WR7	05/31/18	09/18/18	1.3	24	21	28.1	23.7	0
BBC_WR7	06/26/19	09/15/19	0.3	11	11	27.0	24.1	0
BBC_WR7	07/01/19	09/15/19	1.2	6	6	27.0	24.0	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_MC1	2015	0.2	1	0.32	0.32	0.32	3	5.90	7.91	6.97	0	0
BBC_MC1	2016	0.2	1	0.34	0.34	0.34	4	3.53	7.83	5.89	1	0
BBC_MC1	2017	0.2	--	--	--	--	4	5.77	7.70	6.87	0	0
BBC_MC1	2018	0.2	2	0.42	0.46	0.44	4	3.16	6.22	4.97	2	0
BBC_MC1	2019	0.2	1	0.38	0.38	0.38	3	5.28	8.10	6.37	0	0
BBC_MC2	2015	0.2	--	--	--	--	3	3.97	6.28	4.89	2	0
BBC_MC2	2016	0.2	--	--	--	--	4	1.84	16.02	7.06	2	1
BBC_MC2	2017	0.2	1	0.64	0.64	0.64	4	4.81	6.10	5.46	1	0
BBC_MC2	2018	0.2	3	0.43	0.56	0.47	4	4.48	7.27	5.57	2	0
BBC_MC2	2019	0.2	1	0.41	0.41	0.41	4	4.09	8.74	6.42	1	0
BBC_MC3	2015	0.2	--	--	--	--	3	5.25	7.22	6.18	0	0
BBC_MC3	2016	0.2	--	--	--	--	4	5.13	11.42	7.31	0	1
BBC_MC3	2017	0.2	--	--	--	--	4	4.39	6.50	5.40	1	0
BBC_MC3	2018	0.2	1	0.41	0.41	0.41	3	5.90	8.98	7.74	0	0
BBC_MC3	2019	0.2	1	0.41	0.41	0.41	4	0.45	7.30	4.12	2	0
BBC_WR1N	2015	0.2	3	0.33	0.37	0.36	3	7.39	10.13	8.77	0	1
BBC_WR1N	2015	2.7	2	0.36	0.38	0.37	3	6.86	8.20	7.73	0	0
BBC_WR1N	2016	0.2	3	0.56	0.59	0.58	4	9.31	13.55	10.83	0	2
BBC_WR1N	2016	2.9	3	0.49	0.64	0.57	4	6.83	13.61	10.18	0	2
BBC_WR1N	2017	0.2	4	0.48	0.56	0.51	4	7.37	10.56	9.33	0	2
BBC_WR1N	2017	2.0	3	0.52	0.57	0.54	4	7.76	11.15	9.34	0	2
BBC_WR1N	2018	0.2	4	0.43	0.61	0.49	4	6.48	12.03	8.49	0	1
BBC_WR1N	2018	3.1	3	0.42	0.45	0.44	4	5.13	13.50	7.99	0	1
BBC_WR1N	2019	0.2	3	0.38	0.55	0.46	3	3.76	8.50	6.44	1	0
BBC_WR2N	2015	0.2	2	0.39	0.44	0.41	3	7.86	10.58	8.98	0	1

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_WR2N	2016	0.2	3	0.52	0.58	0.56	4	5.54	24.74	12.39	0	2
BBC_WR2N	2017	0.2	2	0.46	0.61	0.54	4	7.96	9.16	8.57	0	0
BBC_WR2N	2018	0.2	3	0.41	0.47	0.45	4	6.80	7.90	7.35	0	0
BBC_WR2N	2019	0.2	3	0.34	0.51	0.44	4	4.85	9.22	7.23	1	0
BBC_WR2X	2015	0.2	4	0.35	0.45	0.39	7	1.47	9.32	5.95	3	0
BBC_WR2X	2016	0.2	3	0.15	0.35	0.28	8	1.54	13.75	4.87	5	1
BBC_WR2X	2017	0.2	4	0.35	0.52	0.45	6	2.87	6.44	3.99	5	0
BBC_WR3N	2015	0.2	2	0.32	0.35	0.33	3	5.83	7.53	6.62	0	0
BBC_WR3N	2016	0.2	1	0.46	0.46	0.46	4	8.60	11.43	10.12	0	3
BBC_WR3N	2017	0.1	--	--	--	--	4	8.23	10.09	9.04	0	1
BBC_WR3N	2018	0.2	2	0.42	0.47	0.44	4	3.96	8.60	6.30	1	0
BBC_WR3N	2019	0.2	2	0.47	0.51	0.49	4	7.05	8.34	7.74	0	0
BBC_WR4	2015	0.2	3	0.34	0.40	0.37	3	5.45	10.30	8.68	0	2
BBC_WR4	2016	0.2	1	0.57	0.57	0.57	4	9.01	11.84	10.53	0	3
BBC_WR4	2017	0.2	--	--	--	--	4	6.64	12.61	9.53	0	2
BBC_WR4	2018	0.2	1	0.50	0.50	0.50	4	5.90	11.02	8.91	0	2
BBC_WR4	2019	0.2	2	0.48	0.52	0.50	4	6.90	17.11	11.28	0	2
BBC_WR5	2015	0.2	7	0.32	0.38	0.35	10	1.36	8.19	5.11	3	0
BBC_WR5	2016	0.2	4	0.18	0.66	0.45	12	1.43	17.83	6.65	6	4
BBC_WR5	2017	0.2	2	0.33	0.53	0.43	9	1.37	8.23	5.29	5	0
BBC_WR5	2018	0.2	2	0.43	0.50	0.47	4	5.39	13.92	8.42	0	1
BBC_WR5	2019	0.2	2	0.50	0.58	0.54	4	7.22	11.55	8.93	0	1
BBC_WR6	2015	0.2	1	0.34	0.34	0.34	3	6.70	8.62	7.96	0	0
BBC_WR6	2016	0.2	1	0.47	0.47	0.47	4	7.19	12.84	10.75	0	3
BBC_WR6	2017	0.2	--	--	--	--	4	6.30	8.96	7.67	0	0
BBC_WR6	2018	0.2	1	0.68	0.68	0.68	4	0.13	10.15	5.14	2	1
BBC_WR6	2019	0.2	2	0.43	0.47	0.45	4	6.90	9.62	8.44	0	0
BBC_WR7	2015	0.2	--	--	--	--	3	6.38	7.51	7.07	0	0
BBC_WR7	2016	0.2	--	--	--	--	4	5.66	10.66	7.45	0	1
BBC_WR7	2017	0.2	--	--	--	--	4	4.89	6.50	5.79	1	0
BBC_WR7	2018	0.2	2	0.39	0.57	0.48	4	5.84	9.25	7.11	0	0
BBC_WR7	2019	0.2	2	0.40	0.42	0.41	4	5.37	9.54	7.05	0	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_MC1	07/05/16	07/05/16	1	1.2	1.2	1.2
BBC_MC1	07/20/17	07/20/17	1	1.7	1.7	1.7
BBC_MC1	08/21/18	08/21/18	1	1.3	1.3	1.3
BBC_MC1	08/08/19	08/08/19	1	1.1	1.1	1.1

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_MC2	06/03/15	08/26/15	8	1.5	2.2	1.9
BBC_MC2	06/05/16	09/16/16	10	1.1	2.5	1.7
BBC_MC2	06/07/17	08/24/17	8	0.7	1.7	1.5
BBC_MC2	06/15/18	09/16/18	8	0.5	1.9	1.4
BBC_MC2	06/26/19	09/15/19	5	1.3	2.2	1.7
BBC_MC3	07/13/15	08/25/15	3	1.5	1.7	1.6
BBC_MC3	07/05/16	08/15/16	4	1.5	1.8	1.6
BBC_MC3	07/10/18	08/21/18	3	1.3	2.0	1.7
BBC_MC3	07/11/19	07/11/19	1	1.6	1.6	1.6
BBC_WR1N	07/13/15	08/25/15	3	1.6	1.8	1.7
BBC_WR1N	07/05/16	08/15/16	4	1.1	1.5	1.3
BBC_WR1N	07/06/17	08/17/17	4	1.4	1.6	1.5
BBC_WR1N	07/10/18	08/21/18	4	1.1	1.9	1.6
BBC_WR1N	07/25/19	08/15/19	3	1.4	1.6	1.5
BBC_WR1X	05/28/15	09/24/15	22	1.3	2.7	1.8
BBC_WR1X	06/06/16	09/21/16	19	1.2	2.3	1.7
BBC_WR1X	05/30/17	09/20/17	15	0.8	2.9	1.8
BBC_WR1X	05/30/18	09/05/18	19	1.3	2.5	1.8
BBC_WR1X	05/30/19	09/23/19	20	1.4	2.3	1.8
BBC_WR2N	07/13/15	08/25/15	3	1.4	1.9	1.6
BBC_WR2N	07/05/16	08/15/16	4	1.1	1.5	1.3
BBC_WR2N	07/06/17	08/17/17	4	1.1	1.7	1.5
BBC_WR2N	07/10/18	08/21/18	4	1.6	1.9	1.8
BBC_WR2N	07/25/19	08/15/19	3	1.2	1.7	1.5
BBC_WR2X	05/28/15	12/09/15	27	1.0	3.2	1.6
BBC_WR2X	03/08/16	09/24/16	27	1.0	1.9	1.4
BBC_WR2X	03/08/17	09/21/17	25	1.0	2.8	1.5
BBC_WR2X	05/30/18	09/19/18	21	1.2	1.9	1.5
BBC_WR2X	05/31/19	09/23/19	22	1.2	1.7	1.4
BBC_WR3N	07/13/15	08/10/15	2	1.8	1.9	1.9
BBC_WR3N	07/05/16	08/15/16	3	1.3	1.5	1.4
BBC_WR3X	06/16/15	09/14/15	12	1.0	1.7	1.4
BBC_WR3X	06/01/16	09/25/16	21	0.6	1.6	1.1
BBC_WR3X	06/21/17	09/20/17	6	1.1	2.0	1.6
BBC_WR3X	05/31/18	08/21/18	5	1.3	1.7	1.5
BBC_WR3X	07/01/19	09/17/19	2	1.8	1.9	1.9
BBC_WR4	07/13/15	08/10/15	2	1.5	1.7	1.6
BBC_WR4	07/05/16	08/15/16	2	1.2	1.3	1.2
BBC_WR4	08/08/19	08/08/19	1	1.0	1.0	1.0
BBC_WR5	06/03/15	09/24/15	23	1.5	2.7	2.1
BBC_WR5	06/01/16	09/23/16	24	1.3	2.5	1.8
BBC_WR5	06/07/17	09/18/17	14	1.4	2.3	1.8
BBC_WR5	06/05/18	09/18/18	14	1.2	2.3	1.8
BBC_WR5	06/26/19	08/15/19	7	1.4	1.8	1.6
BBC_WR6	06/03/15	09/15/15	9	1.5	2.0	1.7

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_WR6	06/05/16	09/16/16	11	1.0	2.2	1.6
BBC_WR6	07/21/17	08/20/17	2	1.6	1.7	1.6
BBC_WR6	07/13/18	08/04/18	2	1.5	1.6	1.5
BBC_WR6	07/01/19	07/15/19	3	1.3	1.8	1.5
BBC_WR7	06/03/15	08/13/15	6	1.5	2.0	1.7
BBC_WR7	06/05/16	08/30/16	3	1.4	1.7	1.6
BBC_WR7	06/11/17	08/24/17	8	0.7	2.0	1.6
BBC_WR7	05/31/18	09/16/18	11	1.3	1.8	1.6
BBC_WR7	06/26/19	09/15/19	5	1.5	2.1	1.7

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_MC1	07/13/15	08/25/15	0.2	3	0.006	0.011	0.008
BBC_MC1	07/05/16	08/15/16	0.2	4	0.004	0.007	0.005
BBC_MC1	07/06/17	08/17/17	0.2	4	0.004	0.006	0.004
BBC_MC1	07/10/18	08/21/18	0.2	4	0.004	0.010	0.005
BBC_MC1	07/25/19	08/15/19	0.2	3	0.004	0.006	0.005
BBC_MC2	07/13/15	08/25/15	0.2	3	0.005	0.012	0.009
BBC_MC2	07/05/16	08/15/16	0.2	4	0.004	0.006	0.005
BBC_MC2	07/06/17	08/17/17	0.2	4	0.004	0.012	0.007
BBC_MC2	07/10/18	08/21/18	0.2	4	0.004	0.007	0.005
BBC_MC2	07/11/19	08/15/19	0.2	4	0.004	0.006	0.005
BBC_MC3	07/13/15	08/25/15	0.2	3	0.006	0.011	0.008
BBC_MC3	07/05/16	08/15/16	0.2	4	0.004	0.008	0.006
BBC_MC3	07/06/17	08/17/17	0.2	4	0.004	0.005	0.004
BBC_MC3	07/10/18	08/21/18	0.2	3	0.004	0.006	0.005
BBC_MC3	07/11/19	08/15/19	0.2	4	0.004	0.009	0.005
BBC_WR1N	07/13/15	08/25/15	0.2	3	0.012	0.018	0.015
BBC_WR1N	07/13/15	08/25/15	2.8	3	0.016	0.029	0.021
BBC_WR1N	07/05/16	08/15/16	0.2	4	0.004	0.053	0.021
BBC_WR1N	07/05/16	08/15/16	2.8	4	0.005	0.051	0.023
BBC_WR1N	07/06/17	08/17/17	0.2	4	0.004	0.010	0.006
BBC_WR1N	07/06/17	08/17/17	2.1	4	0.005	0.014	0.010
BBC_WR1N	07/10/18	08/21/18	0.2	4	0.005	0.050	0.018
BBC_WR1N	07/10/18	08/21/18	3.1	4	0.005	0.035	0.020
BBC_WR1N	07/25/19	08/15/19	0.2	3	0.005	0.091	0.042
BBC_WR2N	07/13/15	08/25/15	0.2	3	0.012	0.017	0.015
BBC_WR2N	07/05/16	08/15/16	0.2	4	0.004	0.051	0.019
BBC_WR2N	07/06/17	08/17/17	0.2	4	0.004	0.013	0.008
BBC_WR2N	07/10/18	08/21/18	0.2	4	0.006	0.051	0.018
BBC_WR2N	07/11/19	08/15/19	0.2	4	0.004	0.073	0.034

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_WR2X	06/16/15	12/09/15	0.2	7	0.013	0.053	0.033
BBC_WR2X	01/06/16	09/26/16	0.2	8	0.004	0.027	0.012
BBC_WR2X	01/09/17	09/19/17	0.2	6	0.008	0.066	0.034
BBC_WR3N	07/13/15	08/25/15	0.2	3	0.008	0.009	0.009
BBC_WR3N	07/05/16	08/15/16	0.2	4	0.004	0.020	0.009
BBC_WR3N	07/06/17	08/17/17	0.1	4	0.004	0.005	0.004
BBC_WR3N	07/10/18	08/21/18	0.2	4	0.004	0.019	0.009
BBC_WR3N	07/11/19	08/15/19	0.2	4	0.004	0.061	0.023
BBC_WR4	07/13/15	08/25/15	0.2	3	0.010	0.012	0.011
BBC_WR4	07/05/16	08/15/16	0.2	4	0.005	0.025	0.011
BBC_WR4	07/06/17	08/17/17	0.2	4	0.004	0.006	0.004
BBC_WR4	07/10/18	08/21/18	0.2	4	0.004	0.005	0.004
BBC_WR4	07/11/19	08/15/19	0.2	4	0.004	0.030	0.011
BBC_WR5	06/16/15	12/09/15	0.2	10	0.009	0.032	0.017
BBC_WR5	01/06/16	09/26/16	0.2	12	0.004	0.028	0.010
BBC_WR5	01/09/17	09/18/17	0.2	9	0.004	0.032	0.010
BBC_WR5	07/10/18	08/21/18	0.2	4	0.004	0.030	0.011
BBC_WR5	07/11/19	08/15/19	0.2	4	0.004	0.040	0.018
BBC_WR6	07/13/15	08/25/15	0.2	2	0.009	0.009	0.009
BBC_WR6	07/05/16	08/15/16	0.2	4	0.005	0.009	0.007
BBC_WR6	07/06/17	08/17/17	0.2	4	0.004	0.006	0.005
BBC_WR6	07/10/18	08/21/18	0.2	4	0.004	0.004	0.004
BBC_WR6	07/11/19	08/15/19	0.2	4	0.004	0.028	0.012
BBC_WR7	07/13/15	08/25/15	0.2	3	0.006	0.010	0.008
BBC_WR7	07/05/16	08/15/16	0.2	4	0.004	0.006	0.005
BBC_WR7	07/06/17	08/17/17	0.2	4	0.004	0.006	0.005
BBC_WR7	07/10/18	08/21/18	0.2	4	0.004	0.007	0.005
BBC_WR7	07/11/19	08/15/19	0.2	4	0.004	0.010	0.006

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Wareham River (MA95-03); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Wareham River (MA95-03): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.1325 sq mi (96%). The approved shellfish growing area represents 0.861 sq mi (73%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB33.0	Stony Point Dike	Approved	0.21214	18.0%
BB36.0	Wareham River	Approved	0.64885	55.0%
BB36.1	Crooked River	Prohibited	0.00143	0.1%
BB36.12	Mirror Cove	Prohibited	0.00354	0.3%
BB36.13	Narrows Road	Prohibited	0.00029	0.0%
BB36.14	Tempest Knob	Conditionally Approved	0.24887	21.1%
BB36.15	Barnes Street	Prohibited	0.00015	0.0%
BB36.3	Wareham River	Prohibited	0.01253	1.1%
BB36.4	West Shoreline of Marks Cove	Prohibited	0.00458	0.4%
BB36.5	Swifts Beach	Prohibited	0.00013	0.0%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Wareham River (MA95-03) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There are four beaches in the Wareham River, Wareham AU (MA95-03); the names and ID codes for the beaches named from up to downstream are as follows: Parkwood (ID 3178), Hamilton (ID 5463), Swifts Neck (ID 3181), and Swifts (ID 3182). The beaches were either rarely or never posted with swimming advisories between 2014 and 2019.</p> <p>The Primary Contact Recreational Use for the Wareham River (MA95-03) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the Parkwood, Hamilton, Swifts Neck, and Swifts beaches between 2014 and 2019.</p>	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
3178	Parkwood/Wareham	41.74795	-70.70200	41.74376	-70.70460	0%	0%	0%	0%	0%	0%	0
3181	Swift's Neck/Wareham	41.73793	-70.71730	41.74003	-70.71570	6%	6%	0%	0%	0%	7%	0
3182	Swift's/Wareham	41.73637	-70.72150	41.73702	-70.71920	1%	6%	0%	0%	0%	0%	0
5463	Hamilton Beach/Wareham	41.74182	-70.71170	41.74440	-70.70950	0%	0%	0%	0%	0%	0%	0

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Wareham River (MA95-03): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.1325 sq mi (96%). The approved shellfish growing area represents 0.861 sq mi (73%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
There are four beaches in the Wareham River, Wareham AU (MA95-03); the names and ID codes for the beaches named from up to downstream are as follows: Parkwood (ID 3178), Hamilton (ID 5463), Swifts Neck (ID 3181), and Swifts (ID 3182). The beaches were either rarely or never posted with swimming advisories between 2014 and 2019. The Secondary Contact Recreational Use for the Wareham River (MA95-03) is assessed as Fully Supporting since there were very few, if any, swimming advisory postings at the Parkwood, Hamilton, Swifts Neck, and Swifts beaches between 2014 and 2019.	

*Shellfish Growing Area Classifications***MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Wareham River (MA95-03): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.1325 sq mi (96%). The approved shellfish growing area represents 0.861 sq mi (73%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Wenham Pond (MA95158)

Location:	Carver.
AU Type:	FRESHWATER LAKE
AU Size:	46 ACRES
Classification/Qualifier:	B

No usable data were available for Wenham Pond (MA95158) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	2	None		Unchanged

West Branch Westport River (MA95-37)

Location:	West of Quail Trail, Westport to mouth at Westport Harbor/Westport River, Westport.
AU Type:	ESTUARY
AU Size:	1.29 SQUARE MILES
Classification/Qualifier:	SA: SFO, HW

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	4a	Estuarine Bioassessments	67641	Changed
5	4a	Fecal Coliform	36172	Unchanged
5	4a	Nitrogen, Total	67641	Changed
5	4a	Nutrient/Eutrophication Biological Indicators	67641	Changed

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Agriculture (Y)	X					
Estuarine Bioassessments	Impervious Surface/Parking Lot Runoff (Y)	X					
Estuarine Bioassessments	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Agriculture (Y)	X					
Nitrogen, Total	Impervious Surface/Parking Lot Runoff (Y)	X					
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nutrient/Eutrophication Biological Indicators	Agriculture (Y)	X					
Nutrient/Eutrophication Biological Indicators	Impervious Surface/Parking Lot Runoff (Y)	X					
Nutrient/Eutrophication Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Estuarine Bioassessments	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Westport River Estuarine System TMDLs for Nitrogen (Total) (Report CN 375.1, approved 2017-05-04, ATTAINS Action ID: 67641)
Nitrogen, Total	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Westport River Estuarine System TMDLs for Nitrogen (Total) (Report CN 375.1, approved 2017-05-04, ATTAINS Action ID: 67641)

2018/20 Removed Impairment	Removal Reason	Removal Comment
Nutrient/Eutrophication Biological Indicators	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Westport River Estuarine System TMDLs for Nitrogen (Total) (Report CN 375.1, approved 2017-05-04, ATAINS Action ID: 67641)

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary (from <p>The MassDEP Eelgrass Mapping Project documented an ~56% loss of eelgrass bed habitat in the West Branch Westport River between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in Westport, in the downstream half of the West Branch Westport River AU (MA95-37) (south of Sanford Flat) in the summers of 2015-2019 from upstream to downstream as follows: BBC_W12, 112W, and W9. Station BBC_112W was closest to shore (samples collected from a dock) and BBC_W12 and W9 were further from shore (in the deep channel on the west side of the river). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column (at depths up to 1m at BBC_112W and 2.6m at BBC_W12) and was usually conducted weekly (between the hours of 6 & 9am). The maximum temperature at all three stations was 28°C (n=150). Dissolved oxygen (DO) was only measured at BBC_112W, the minimum was 4.0mg/L (n=103) and while near surface measurements were all ≥ 6.4mg/L frequent excursions from the DO criterion (6.0mg/L) always occurred for >10% of the measurements annually at depth (average sample depths 0.7 to 0.9m). Total nitrogen sampling (n=58, maximum 0.9mg/L at BBC_W12) during ebb tides in June to September documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.38-0.72mg/L which frequently (eight of 16 times) exceeded the TMDL threshold target of 0.48mg/l to protect high aquatic habitat quality in the West Branch Westport River (MassDEP 2017). The maximum chlorophyll <i>a</i> was 13.14µg/L (n=66); >5µg/L 12 times, >10µg/L only twice. Secchi disk depths (usually measured weekly in the summers of 2015-2019, n=57) ranged from 0.5m (at BBC_112W in 2015) to 2.3m, though yearly averages for sites with more than one measurement ranged from 1.2-1.9m. Ammonia-nitrogen concentrations were usually low, ranging from 0.004 to 0.06mg/L (n=66), however TUs for ammonia-nitrogen could not be calculated (lack of quality assured pH and salinity data).</p> <p>The Aquatic Life Use for West Branch Westport River (MA95-37) will continue to be assessed as Not Supporting based on the loss of eelgrass bed habitat documented by the MassDEP between 1995 and 2017 and the water quality data collected by BBC staff/volunteers in 2015-2019. The Estuarine Bioassessments, Total Nitrogen, and Nutrient/Eutrophication Biological Indicators impairments are all being carried forward.</p>	

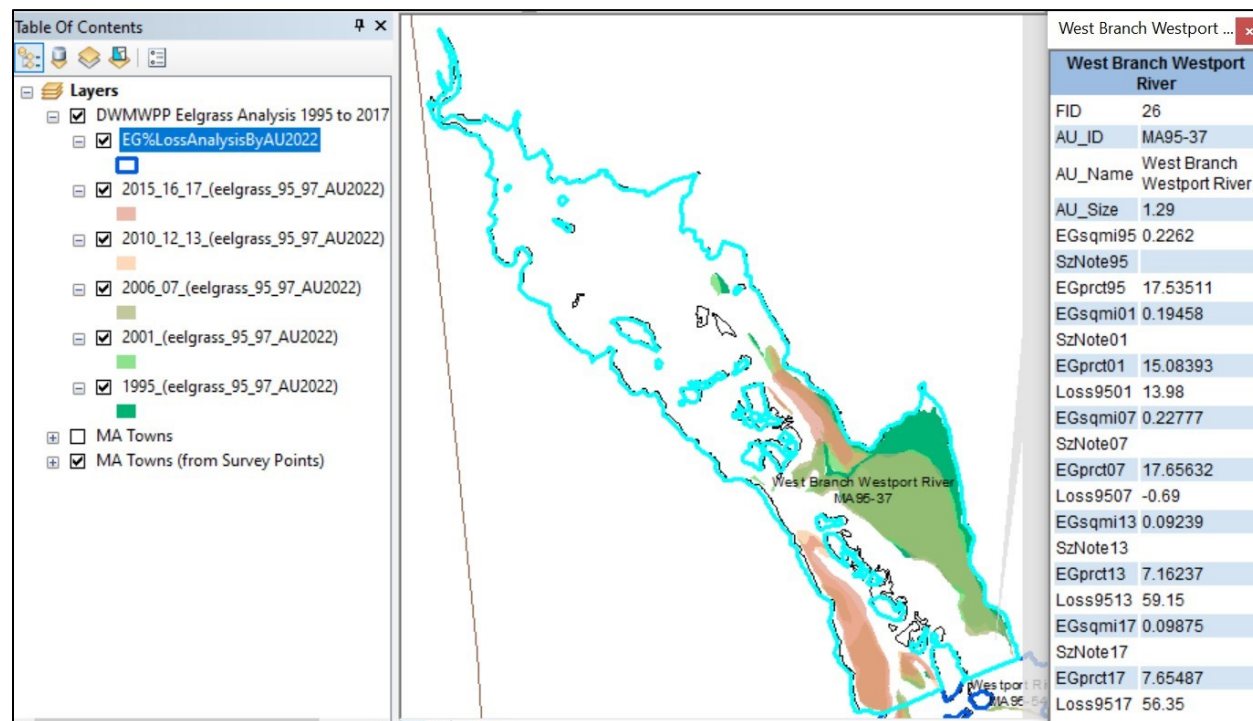
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_112W	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River West Inner, Westport	41.52708	-71.099607
BBC_W12	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River West, Westport	41.530439	-71.100328
BBC_W9	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River West, Westport	41.522419	-71.095433

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for the West Branch Westport River MA95-37 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~56% loss of eelgrass bed habitat in the West Branch Westport River between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_112W	06/29/15	06/29/15	0.2	1	6.4	6.4	0	0	0
BBC_112W	05/28/15	09/23/15	0.8	22	5.5	6.5	14	0	0
BBC_112W	06/15/16	06/15/16	0.2	1	7.4	7.4	0	0	0
BBC_112W	06/01/16	09/24/16	0.9	21	4.5	6.4	24	5	0
BBC_112W	06/06/17	09/20/17	0.8	21	5.0	6.0	48	0	0
BBC_112W	06/16/18	09/19/18	0.7	19	4.0	5.4	63	26	0
BBC_112W	06/20/19	09/23/19	0.8	18	5.0	6.8	22	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_112W	06/16/15	09/24/15	0.2	4	3	22.0	20.4	0
BBC_112W	05/28/15	09/23/15	0.8	22	19	24.0	20.7	0
BBC_112W	01/06/16	09/26/16	0.2	6	3	22.0	19.9	0
BBC_112W	06/01/16	09/24/16	1.0	21	19	25.0	20.7	0
BBC_112W	01/09/17	09/19/17	0.2	6	3	19.9	18.0	0
BBC_112W	06/06/17	09/20/17	0.8	21	19	23.0	19.8	0
BBC_112W	06/16/18	09/19/18	0.7	19	18	25.0	22.0	0
BBC_112W	06/20/19	09/23/19	0.8	18	16	25.0	21.6	0
BBC_W12	07/13/15	08/25/15	0.2	3	3	28.0	25.0	0
BBC_W12	07/13/15	08/25/15	2.6	3	3	28.0	25.3	0
BBC_W12	07/05/16	08/15/16	0.2	4	4	26.0	25.0	0
BBC_W12	07/05/16	08/15/16	2.1	4	4	28.0	25.4	0
BBC_W12	07/06/17	08/17/17	0.2	3	3	25.5	24.6	0
BBC_W12	07/06/17	08/17/17	2.1	3	3	25.0	24.6	0
BBC_W12	07/10/18	08/21/18	0.2	4	4	27.0	24.5	0
BBC_W12	07/10/18	08/21/18	2.1	4	4	27.0	24.7	0
BBC_W12	07/11/19	08/15/19	0.2	4	4	24.0	23.6	0
BBC_W9	07/13/15	08/25/15	0.2	3	3	26.0	24.3	0
BBC_W9	07/05/16	08/15/16	0.2	4	4	28.0	24.8	0
BBC_W9	07/06/17	08/17/17	0.2	3	3	25.2	24.1	0
BBC_W9	07/10/18	08/21/18	0.2	4	4	27.0	24.5	0
BBC_W9	07/11/19	08/15/19	0.2	4	4	24.1	23.4	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_112W	2015	0.2	4	0.25	0.56	0.42	4	2.97	3.98	3.46	4	0
BBC_112W	2016	0.2	2	0.43	0.50	0.46	6	1.27	3.95	2.98	6	0
BBC_112W	2017	0.2	4	0.30	0.65	0.43	6	1.39	3.81	2.49	6	0
BBC_W12	2015	0.2	3	0.42	0.77	0.64	3	1.95	8.74	5.24	2	0
BBC_W12	2015	2.6	3	0.34	0.68	0.55	3	3.04	7.70	5.29	1	0
BBC_W12	2016	0.2	4	0.37	0.52	0.44	4	1.77	3.95	2.71	4	0
BBC_W12	2016	2.1	4	0.40	0.56	0.49	4	1.50	3.64	2.76	4	0
BBC_W12	2017	0.2	3	0.48	0.74	0.63	3	2.53	13.14	6.54	2	1
BBC_W12	2017	2.1	3	0.54	0.90	0.72	3	3.01	8.29	5.04	2	0
BBC_W12	2018	0.2	4	0.33	0.62	0.47	4	2.42	11.41	5.47	3	1
BBC_W12	2018	2.1	4	0.32	0.54	0.43	4	2.69	8.37	5.15	2	0
BBC_W12	2019	0.2	4	0.31	0.76	0.52	4	1.68	6.17	3.47	3	0
BBC_W9	2015	0.2	3	0.36	0.88	0.55	3	2.51	9.12	5.64	1	0
BBC_W9	2016	0.2	4	0.34	0.53	0.48	4	1.63	2.62	2.15	4	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_W9	2017	0.2	3	0.56	0.72	0.61	3	4.23	5.82	4.81	2	0
BBC_W9	2018	0.2	3	0.32	0.45	0.38	4	2.50	4.62	3.24	4	0
BBC_W9	2019	0.2	3	0.28	0.77	0.48	4	1.66	4.63	3.31	4	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_112W	06/16/15	09/24/15	7	0.5	2.0	1.2
BBC_112W	06/01/16	09/26/16	8	1.0	1.9	1.3
BBC_112W	06/06/17	09/20/17	5	0.7	2.2	1.2
BBC_112W	07/26/19	07/26/19	1	0.9	0.9	0.9
BBC_W12	07/13/15	08/25/15	3	1.5	1.8	1.7
BBC_W12	07/05/16	08/15/16	4	1.4	2.1	1.7
BBC_W12	07/06/17	08/17/17	3	0.9	1.6	1.2
BBC_W12	07/10/18	08/21/18	4	1.0	1.4	1.3
BBC_W12	07/11/19	08/15/19	4	0.6	2.1	1.4
BBC_W9	07/13/15	08/25/15	3	1.7	2.0	1.9
BBC_W9	07/05/16	08/15/16	4	1.5	2.0	1.9
BBC_W9	07/06/17	08/17/17	3	1.2	1.8	1.4
BBC_W9	07/10/18	08/21/18	4	1.2	1.6	1.5
BBC_W9	07/11/19	08/15/19	4	0.6	2.3	1.6

Toxics and other pollutants (metals, ammonia, chlorine)
Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_112W	06/16/15	09/24/15	0.2	4	0.020	0.034	0.025
BBC_112W	01/06/16	09/26/16	0.2	6	0.004	0.062	0.030
BBC_112W	01/09/17	09/19/17	0.2	6	0.005	0.033	0.016
BBC_W12	07/13/15	08/25/15	0.2	3	0.017	0.047	0.031
BBC_W12	07/13/15	08/25/15	2.6	3	0.019	0.040	0.027
BBC_W12	07/05/16	08/15/16	0.2	4	0.011	0.018	0.013
BBC_W12	07/05/16	08/15/16	2.1	4	0.010	0.027	0.015
BBC_W12	07/06/17	08/17/17	0.2	3	0.009	0.015	0.011
BBC_W12	07/06/17	08/17/17	2.1	3	0.008	0.014	0.011
BBC_W12	07/10/18	08/21/18	0.2	4	0.005	0.011	0.008
BBC_W12	07/10/18	08/21/18	2.1	4	0.005	0.027	0.012
BBC_W12	07/11/19	08/15/19	0.2	4	0.007	0.023	0.014
BBC_W9	07/13/15	08/25/15	0.2	3	0.016	0.038	0.026
BBC_W9	07/05/16	08/15/16	0.2	4	0.008	0.015	0.011

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_W9	07/06/17	08/17/17	0.2	3	0.006	0.007	0.006
BBC_W9	07/10/18	08/21/18	0.2	4	0.004	0.012	0.007
BBC_W9	07/11/19	08/15/19	0.2	4	0.007	0.023	0.016

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in the West Branch Westport River (MA95-37); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
West Branch Westport River (MA95-37): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.2065 sq mi (94%). The approved shellfish growing area represents 0.2002 sq mi (16%). The Shellfish Harvesting Use is assessed as Not Supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB3.12	Upper River	Conditionally Approved	0.21852	17.0%
BB3.15	River Road	Prohibited	0.07552	5.9%
BB3.19	Judy Island	Conditionally Approved	0.22922	17.8%
BB3.2	Grasshopper Point Brook	Prohibited	0.00069	0.1%
BB3.3	North End of River	Prohibited	0.19214	14.9%
BB3.31	Point Bial	Prohibited	0.28978	22.5%
BB3.34	Carey's Boat Yard	Conditionally Approved	0.00044	0.0%
BB3.39	Canoe Rock	Approved	0.20021	15.6%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for the West Branch Westport River (MA95-37) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	

E. coli bacteria data were collected by MassDEP staff for the purposes of bacteria source tracking (BST) in this West Branch Westport River AU (MA95-37). Samples were collected for some of the headwater tributaries in 2013 as well as in the tributary known as Dunhams Brook (MA95-73) in 2018; however no correctable sources were ever found. During the BST study of Dunhams Brook, two samples were analyzed from the Hicks Cove area (on the east side of the AU), noting a maximum *E. coli* concentration of 86MPN/100ml.

Too limited bacteria data are available to assess the Primary Contact Recreational Use for the West Branch Westport River (MA95-37) so it is assessed as having Insufficient Information.

Bacteria Data

MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019 (MassDEP Undated2)

Summary
BST work was conducted in 2013 at 4 sites in the headwater tributaries (not an AU) to West Branch Westport River AU (MA95-37). The closest sample site to the AU was at the outlet of Grays Mill Pond, Adamsville, RI. Over all 4 sites <i>E. coli</i> concentrations ranged from 21 to 410MPN and no correctable sources were ever found. BST work was also conducted on the Dunhams Brook AU in 2018 and <i>E. coli</i> concentrations ranging 185 to 727MPN were observed in the still flowing waters, at the downstream end of the brook. No human sources were found on Dunhams Brook. Also in 2018, two samples were analyzed from the Hicks Cove area of the AU with a max <i>E. coli</i> concentration of 86MPN.

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
West Branch Westport River (MA95-37): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.2065 sq mi (94%). The approved shellfish growing area represents 0.2002 sq mi (16%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	
<i>E. coli</i> bacteria data were collected by MassDEP staff for the purposes of bacteria source tracking (BST) in this West Branch Westport River AU (MA95-37). Samples were collected for some of the headwater tributaries in 2013 as well as in the tributary known as Dunhams Brook (MA95-73) in 2018; however no correctable sources were ever found. During the BST study of Dunhams Brook, two samples were analyzed from the Hicks Cove area (on the east side of the AU), noting a maximum <i>E. coli</i> concentration of 86MPN/100ml. Too limited bacteria data are available to assess the Secondary Contact Recreational Use for the West Branch Westport River (MA95-37) so it is assessed as having Insufficient Information.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
West Branch Westport River (MA95-37): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 1.2065 sq mi (94%). The approved shellfish growing area represents 0.2002 sq mi (16%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

West Falmouth Harbor (MA95-22)

Location:	From the confluence with Harbor Head at Chappaquoit Road, Falmouth to the mouth at Buzzards Bay at a line connecting the ends of the seawalls from Little Island and Chappaquoit Point, Falmouth (including Inner West Falmouth Harbor, Outer West Falmouth Harbor, Snug Harbor, and Mashapaquit Creek).
AU Type:	ESTUARY
AU Size:	0.29 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	5	Estuarine Bioassessments	34332, 34328	Unchanged
4a	5	Fecal Coliform	36172	Unchanged
4a	5	Nitrogen, Total	34332, 34918, 34917, 34328	Unchanged
4a	5	Nutrient/Eutrophication Biological Indicators		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Municipal Point Source Discharges (Y)	X					
Estuarine Bioassessments	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Estuarine Bioassessments	Septage Disposal (Y)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Municipal Point Source Discharges (Y)	X					
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nitrogen, Total	Septage Disposal (Y)	X					
Nutrient/Eutrophication Biological Indicators	Municipal Point Source Discharges (Y)	X					
Nutrient/Eutrophication Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nutrient/Eutrophication Biological Indicators	Septage Disposal (Y)	X					

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO

2022 Use Attainment Summary

The MassDEP Eelgrass Mapping Project documented an ~20% loss of eelgrass bed habitat in West Falmouth Harbor between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at ten locations in West Falmouth Harbor, Falmouth in the summers of 2015-2019 from inner to outer as follows: in the tributary locally known as “Mashapaquit Creek” (BBC_MAC1), the upstream end of Snug Harbor at Nashawena St. (BBC_WF2), the middle of Snug Harbor (BBC_WF11), at the West Falmouth Harbor Town Dock (BBC_WF1X and WF1N), at the far south-side of the harbor (also known as mid-harbor) (BBC_WF4X and WF5N), in the “outer harbor” (BBC_WF6 and BBC_WF9N), and right at the mouth of the harbor (BBC_WF9X). Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at BBC_WF2, WF1X, WF4X, and WF9X (at depths ranging from 0.7 to 2.0m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 27.6°C (n=550). The minimum dissolved oxygen (DO) was 2.5mg/L (n=600): <6.0mg/L 230 times (~38% of the measurements overall) and <5.0mg/L 76 times (~13% of the measurements overall) with the most frequent and severe excursions from the 6.0mg/L criterion at BBC_WF2 and WF4X at both surface and depth, with intermittent measurements <6.0mg/L throughout the harbor. Total nitrogen sampling (n=137, maximum 4.36mg/L) during ebb tides usually in June through September documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.31-1.92mg/L; >0.4mg/L 18 of 26 times with the highest concentrations documented in Mashapaquit Creek (BBC_MAC1). The maximum Chlorophyll *a* was 247.68µg/L (n=222); >5µg/L 87 times and >10µg/L 33 times overall (15%) with the most consistently high measurements at Mashapaquit Creek and the upper end of Snug Harbor (BBC_MAC1 and WF2). Secchi disk depths ranged from 0.5 to 2.7m (n=100). Ammonia-nitrogen concentrations ranged from 0.004 to 0.265mg/L (n=222), though TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for West Falmouth Harbor (MA95-22) will continue to be assessed as Not Supporting based on the loss of eelgrass bed habitat documented by the MassDEP between 1995 and 2017 and the water quality data collected by BBC staff/volunteers in 2015-2019 which are indicative of poor conditions (especially in the “Mashapaquit Creek”/“upstream end of Snug Harbor” area of the AU). The Estuarine Bioassessments and Total Nitrogen impairments are both being carried forward. An impairment for Nutrient/Eutrophication Biological Indicators is being added based on the low Dissolved Oxygen and elevated Chlorophyll *a* concentrations (in conjunction with the elevated Total Nitrogen) documented by the BBC staff/volunteers in 2015-2019.

Monitoring Stations

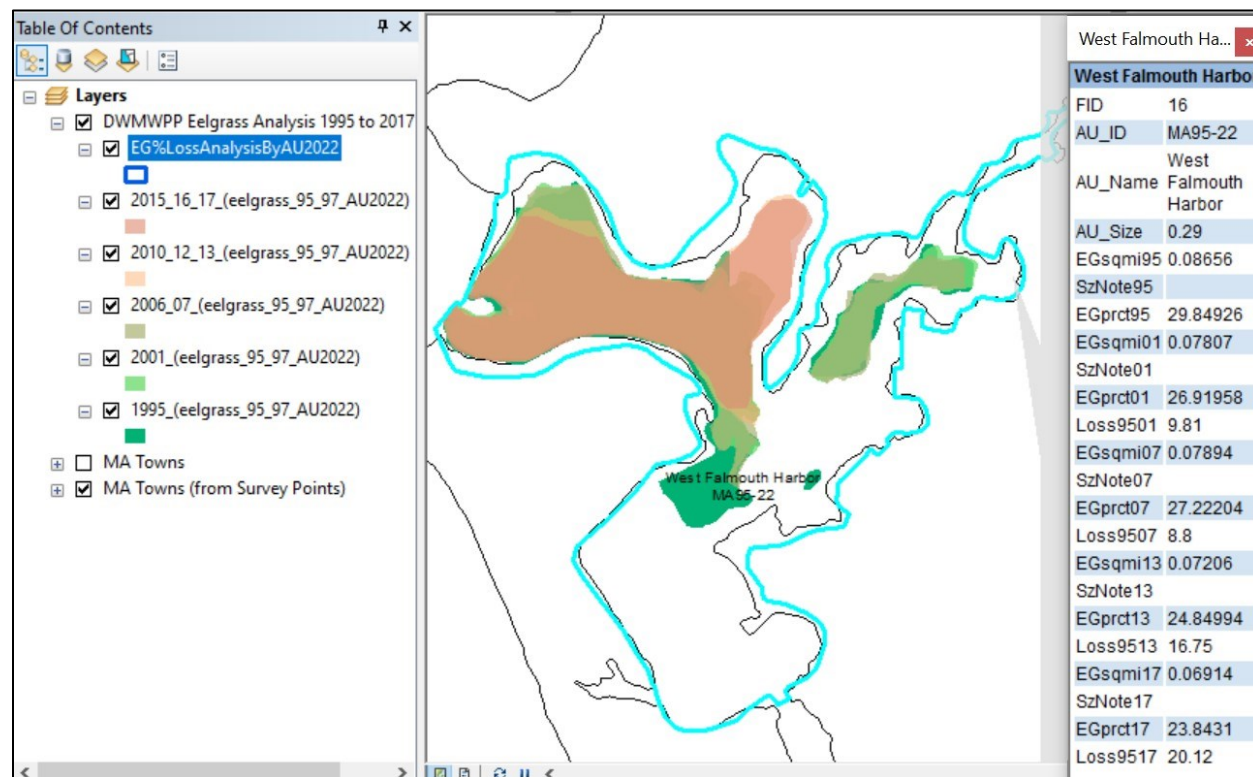
Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_MAC1	Buzzards Bay Coalition	Water Quality	West Falmouth Harbor	Mashapaquit Creek, Falmouth	41.611005	-70.633487
BBC_WF11	Buzzards Bay Coalition	Water Quality	West Falmouth Harbor	West Falmouth Snug Harbor, Falmouth	41.607151	-70.638482
BBC_WF1N	Buzzards Bay Coalition	Water Quality	West Falmouth Harbor	West Falmouth Harbor Town Dock, Falmouth	41.604066	-70.63942
BBC_WF1X	Buzzards Bay Coalition	Water Quality	West Falmouth Harbor	West Falmouth Harbor Town Dock, Falmouth	41.603964	-70.639281
BBC_WF2	Buzzards Bay Coalition	Water Quality	West Falmouth Harbor	West Falmouth Snug Harbor, Falmouth	41.608661	-70.63719
BBC_WF4X	Buzzards Bay Coalition	Water Quality	West Falmouth Harbor	West Falmouth Mid-Harbor, Falmouth	41.598398	-70.64267

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_WF5N	Buzzards Bay Coalition	Water Quality	West Falmouth Harbor	West Falmouth Mid-Harbor, Falmouth	41.599457	-70.645197
BBC_WF6	Buzzards Bay Coalition	Water Quality	West Falmouth Harbor	West Falmouth Harbor Outer, Falmouth	41.606217	-70.643328
BBC_WF9N	Buzzards Bay Coalition	Water Quality	West Falmouth Harbor	West Falmouth Harbor Outer, Falmouth	41.605694	-70.650038
BBC_WF9X	Buzzards Bay Coalition	Water Quality	West Falmouth Harbor	West Falmouth Harbor Outer, Falmouth	41.606047	-70.651667

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for West Falmouth Harbor MA95-22 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~20% loss of eelgrass bed habitat in West Falmouth Harbor between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_MAC1	07/05/16	08/01/16	0.2	2	3.6	4.7	100	50	50
BBC_MAC1	07/06/17	08/17/17	0.1	4	6.4	8.8	0	0	0
BBC_MAC1	07/10/18	08/21/18	0.1	4	2.9	7.6	50	50	50
BBC_MAC1	07/25/19	08/15/19	0.1	3	6.1	10.2	0	0	0
BBC_WF11	07/13/15	08/25/15	0.2	4	4.9	5.5	75	25	0
BBC_WF11	07/05/16	08/15/16	0.2	4	4.9	6.9	50	25	0
BBC_WF11	07/06/17	08/17/17	0.2	4	5.1	6.5	50	0	0
BBC_WF11	07/10/18	08/21/18	0.2	3	5.1	6.2	33	0	0
BBC_WF11	07/25/19	08/15/19	0.2	3	5.7	6.5	33	0	0
BBC_WF1N	07/13/15	08/25/15	0.2	4	5.3	5.8	75	0	0
BBC_WF1N	07/05/16	08/15/16	0.2	4	5.7	7.0	25	0	0
BBC_WF1N	07/06/17	08/17/17	0.2	3	6.1	6.6	0	0	0
BBC_WF1N	07/10/18	08/21/18	0.2	3	5.6	6.6	33	0	0
BBC_WF1N	07/25/19	08/15/19	0.2	2	6.9	7.0	0	0	0
BBC_WF1X	06/19/15	09/24/15	0.2	21	3.1	6.1	38	14	10
BBC_WF1X	06/19/15	09/23/15	1.9	18	4.0	6.1	33	17	0
BBC_WF1X	01/06/16	09/28/16	0.2	12	5.6	8.2	17	0	0
BBC_WF1X	06/01/16	09/28/16	1.8	6	5.4	7.4	33	0	0
BBC_WF1X	03/08/17	09/19/17	0.2	21	5.9	7.3	5	0	0
BBC_WF1X	05/31/17	09/17/17	1.2	15	6.0	6.8	0	0	0
BBC_WF1X	07/03/18	07/27/18	0.2	3	6.5	7.5	0	0	0
BBC_WF1X	06/11/18	09/19/18	0.8	18	5.5	7.2	6	0	0
BBC_WF1X	08/02/19	09/23/19	0.2	8	5.6	6.3	38	0	0
BBC_WF1X	08/02/19	09/23/19	1.8	7	4.7	6.0	29	14	0
BBC_WF2	06/17/15	12/09/15	0.2	23	2.5	6.6	30	22	9
BBC_WF2	06/11/15	08/27/15	0.9	14	3.7	6.9	21	14	7
BBC_WF2	01/06/16	09/26/16	0.2	20	2.8	7.1	35	20	15
BBC_WF2	05/30/16	09/20/16	0.7	17	4.0	5.7	53	18	0
BBC_WF2	01/09/17	09/19/17	0.2	21	4.1	6.2	48	14	0
BBC_WF2	06/06/17	09/06/17	0.8	14	2.7	5.3	79	43	14
BBC_WF2	06/27/18	09/11/18	0.2	6	3.9	5.3	67	33	17
BBC_WF2	06/05/18	09/20/18	0.8	16	2.7	5.8	44	38	19
BBC_WF2	07/16/19	09/05/19	0.2	6	4.1	5.6	50	50	0
BBC_WF2	06/27/19	09/23/19	0.9	12	4.6	5.5	83	25	0
BBC_WF4X	06/19/15	09/24/15	0.2	14	3.3	5.7	36	29	7
BBC_WF4X	06/19/15	08/27/15	1.0	11	4.1	5.5	73	27	0
BBC_WF4X	01/06/16	09/26/16	0.2	17	3.4	6.8	29	12	6
BBC_WF4X	06/12/16	09/01/16	1.2	11	3.2	5.7	55	18	9
BBC_WF4X	01/09/17	09/19/17	0.2	13	4.4	6.9	46	8	0
BBC_WF4X	06/13/17	09/01/17	1.0	14	4.3	5.8	64	14	0
BBC_WF4X	06/12/18	09/11/18	0.2	5	3.6	5.7	40	40	20
BBC_WF4X	06/05/18	09/20/18	0.8	15	2.9	5.7	53	20	20
BBC_WF4X	07/16/19	08/08/19	0.2	3	4.5	5.5	67	33	0
BBC_WF4X	06/27/19	09/08/19	0.8	9	4.2	5.5	89	11	0
BBC_WF5N	07/13/15	08/25/15	0.2	4	5.2	5.5	100	0	0
BBC_WF5N	07/05/16	08/15/16	0.2	4	4.9	6.0	50	25	0
BBC_WF5N	07/06/17	08/17/17	0.2	3	5.6	6.0	33	0	0
BBC_WF5N	07/10/18	08/21/18	0.2	3	6.0	6.3	0	0	0
BBC_WF5N	07/25/19	08/15/19	0.2	3	5.6	6.3	33	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_WF6	06/16/15	09/24/15	0.2	8	3.9	5.7	75	25	13
BBC_WF6	06/01/16	09/26/16	0.2	8	5.8	7.2	13	0	0
BBC_WF6	01/09/17	09/18/17	0.2	8	6.0	7.7	0	0	0
BBC_WF6	07/10/18	08/21/18	0.2	3	5.3	6.4	33	0	0
BBC_WF6	07/25/19	08/15/19	0.2	3	5.8	6.7	33	0	0
BBC_WF9N	06/29/15	09/24/15	0.2	7	3.5	5.4	86	14	14
BBC_WF9N	07/05/16	08/15/16	0.2	4	6.3	7.5	0	0	0
BBC_WF9N	07/06/17	08/17/17	0.2	3	5.8	6.2	67	0	0
BBC_WF9N	07/10/18	08/21/18	0.2	3	5.4	6.2	33	0	0
BBC_WF9N	07/25/19	08/15/19	0.2	2	6.6	6.6	0	0	0
BBC_WF9X	10/09/15	12/09/15	0.2	3	7.5	8.6	0	0	0
BBC_WF9X	01/06/16	09/26/16	0.2	10	5.8	8.4	10	0	0
BBC_WF9X	07/29/16	08/24/16	0.9	2	5.7	6.4	50	0	0
BBC_WF9X	01/09/17	09/19/17	0.2	14	5.3	7.4	7	0	0
BBC_WF9X	07/26/17	09/06/17	1.2	7	5.7	6.6	14	0	0
BBC_WF9X	07/02/18	08/19/18	0.2	8	5.5	7.0	13	0	0
BBC_WF9X	06/20/18	08/19/18	1.1	11	5.0	7.2	18	0	0
BBC_WF9X	05/30/19	09/23/19	0.2	21	4.5	7.0	24	5	0
BBC_WF9X	05/30/19	09/23/19	1.3	21	5.5	6.9	10	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_MAC1	07/13/15	08/25/15	0.1	4	4	22.0	20.0	0
BBC_MAC1	07/05/16	08/15/16	0.1	4	4	26.0	22.8	0
BBC_MAC1	07/06/17	08/17/17	0.1	4	4	23.4	19.4	0
BBC_MAC1	07/10/18	08/21/18	0.1	4	4	21.1	20.2	0
BBC_MAC1	07/11/19	08/15/19	0.1	4	4	23.3	17.8	0
BBC_WF11	07/13/15	08/25/15	0.2	4	4	25.7	24.2	0
BBC_WF11	07/05/16	08/15/16	0.2	4	4	27.4	25.7	0
BBC_WF11	07/06/17	08/17/17	0.2	4	4	25.0	23.9	0
BBC_WF11	07/10/18	08/21/18	0.2	4	4	24.6	23.7	0
BBC_WF11	07/25/19	08/15/19	0.2	3	3	24.4	23.6	0
BBC_WF1N	07/13/15	08/25/15	0.2	4	4	25.6	23.9	0
BBC_WF1N	07/05/16	08/15/16	0.2	4	4	26.3	25.3	0
BBC_WF1N	07/06/17	08/17/17	0.2	3	3	25.7	24.4	0
BBC_WF1N	07/10/18	08/21/18	0.2	4	4	26.0	24.2	0
BBC_WF1N	07/25/19	08/15/19	0.2	2	2	24.6	23.7	0
BBC_WF1X	06/16/15	09/24/15	0.2	22	19	25.8	23.0	0
BBC_WF1X	06/19/15	09/23/15	2.0	18	16	25.8	23.2	0
BBC_WF1X	01/06/16	09/28/16	0.2	12	8	25.3	20.1	0
BBC_WF1X	06/01/16	09/28/16	1.7	6	5	25.4	19.7	0
BBC_WF1X	03/08/17	09/19/17	0.2	22	18	24.6	20.4	0
BBC_WF1X	05/31/17	09/17/17	1.2	15	13	25.3	21.3	0
BBC_WF1X	07/03/18	07/27/18	0.2	3	3	24.0	23.3	0
BBC_WF1X	06/11/18	09/19/18	0.8	18	17	25.0	22.4	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_WF1X	08/02/19	09/23/19	0.2	8	7	25.1	22.7	0
BBC_WF1X	08/02/19	09/23/19	1.9	7	6	24.4	22.4	0
BBC_WF2	06/16/15	12/09/15	0.2	24	20	25.6	22.3	0
BBC_WF2	06/11/15	08/27/15	0.9	13	13	26.8	22.1	0
BBC_WF2	01/06/16	09/26/16	0.2	20	15	26.8	22.6	0
BBC_WF2	05/30/16	09/20/16	0.7	16	14	26.0	21.6	0
BBC_WF2	01/09/17	09/19/17	0.2	21	18	24.8	21.1	0
BBC_WF2	06/06/17	09/06/17	0.8	14	14	25.7	22.3	0
BBC_WF2	06/27/18	09/11/18	0.2	7	7	24.6	22.3	0
BBC_WF2	06/05/18	09/20/18	0.8	16	15	25.4	21.8	0
BBC_WF2	07/16/19	09/05/19	0.2	6	6	24.7	23.2	0
BBC_WF2	06/27/19	09/23/19	0.9	12	11	25.7	22.7	0
BBC_WF4X	06/16/15	09/24/15	0.2	15	14	26.4	23.4	0
BBC_WF4X	06/19/15	08/27/15	1.0	11	11	26.6	23.7	0
BBC_WF4X	01/06/16	09/26/16	0.2	17	14	27.2	22.0	0
BBC_WF4X	06/12/16	09/01/16	1.2	11	11	27.3	22.8	0
BBC_WF4X	01/09/17	09/19/17	0.2	13	10	25.7	22.1	0
BBC_WF4X	06/13/17	09/01/17	1.0	14	14	26.0	22.7	0
BBC_WF4X	06/12/18	09/11/18	0.2	5	5	23.1	19.7	0
BBC_WF4X	06/05/18	09/20/18	0.9	15	14	25.6	21.9	0
BBC_WF4X	07/16/19	08/08/19	0.2	3	3	25.4	24.7	0
BBC_WF4X	06/27/19	09/08/19	0.8	9	9	25.5	23.1	0
BBC_WF5N	07/13/15	08/25/15	0.2	4	4	25.2	23.8	0
BBC_WF5N	07/05/16	08/15/16	0.2	4	4	27.0	25.4	0
BBC_WF5N	07/06/17	08/17/17	0.2	3	3	25.4	24.2	0
BBC_WF5N	07/10/18	08/21/18	0.2	4	4	26.0	24.2	0
BBC_WF5N	07/25/19	08/15/19	0.2	3	3	24.8	23.9	0
BBC_WF6	06/16/15	09/24/15	0.2	8	7	25.4	23.0	0
BBC_WF6	01/06/16	09/26/16	0.2	10	7	27.6	23.3	0
BBC_WF6	01/09/17	09/18/17	0.2	8	5	25.7	22.5	0
BBC_WF6	07/10/18	08/21/18	0.2	4	4	26.0	24.4	0
BBC_WF6	07/25/19	08/15/19	0.2	3	3	24.7	23.7	0
BBC_WF9N	06/16/15	09/24/15	0.2	8	7	25.2	22.6	0
BBC_WF9N	07/05/16	08/15/16	0.2	4	4	27.0	25.3	0
BBC_WF9N	07/06/17	08/17/17	0.2	3	3	25.4	23.9	0
BBC_WF9N	07/10/18	08/21/18	0.2	4	4	26.0	24.2	0
BBC_WF9N	07/25/19	08/15/19	0.2	2	2	23.9	23.3	0
BBC_WF9X	10/09/15	12/09/15	0.2	3	0	16.9	12.9	--
BBC_WF9X	01/06/16	09/26/16	0.2	10	5	26.3	21.7	0
BBC_WF9X	07/29/16	08/24/16	0.9	2	2	26.2	24.8	0
BBC_WF9X	01/09/17	09/19/17	0.2	14	11	23.7	21.0	0
BBC_WF9X	07/26/17	09/06/17	1.2	7	7	23.2	21.6	0
BBC_WF9X	07/02/18	08/19/18	0.2	9	9	27.0	24.3	0
BBC_WF9X	06/20/18	08/19/18	1.1	11	11	26.0	23.2	0
BBC_WF9X	05/30/19	09/23/19	0.2	21	18	26.0	21.9	0
BBC_WF9X	05/30/19	09/23/19	1.3	20	17	26.0	21.5	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_MAC1	2015	0.1	4	0.88	4.36	1.92	4	1.27	247.68	68.06	1	2
BBC_MAC1	2016	0.1	4	0.66	1.12	0.88	4	6.19	10.49	8.06	0	1
BBC_MAC1	2017	0.1	4	0.88	2.40	1.46	4	2.90	134.84	38.94	1	2
BBC_MAC1	2018	0.1	4	0.44	2.40	1.47	4	5.00	125.41	45.91	1	2
BBC_MAC1	2019	0.1	4	1.04	3.08	1.59	4	5.43	10.74	8.24	0	2
BBC_WF11	2015	0.2	4	0.37	0.60	0.50	4	4.18	13.98	10.24	1	2
BBC_WF11	2016	0.2	3	0.41	0.70	0.54	4	4.83	11.90	8.75	1	2
BBC_WF11	2017	0.2	3	0.38	0.62	0.48	4	5.43	10.35	7.34	0	1
BBC_WF11	2018	0.2	4	0.43	1.77	0.81	4	6.16	11.20	8.86	0	1
BBC_WF11	2019	0.2	1	0.48	0.48	0.48	3	0.70	9.54	5.90	1	0
BBC_WF1N	2015	0.2	4	0.27	0.45	0.38	4	4.05	7.70	5.45	2	0
BBC_WF1N	2016	0.2	4	0.33	0.51	0.43	4	3.78	15.02	8.15	1	1
BBC_WF1N	2017	0.2	1	0.37	0.37	0.37	3	2.66	6.44	4.66	2	0
BBC_WF1N	2018	0.2	2	0.32	0.39	0.36	4	2.66	9.23	5.19	2	0
BBC_WF1N	2019	0.2	1	0.42	0.42	0.42	2	2.85	5.37	4.11	1	0
BBC_WF1X	2015	0.2	4	0.32	0.63	0.48	4	3.34	10.25	6.19	1	1
BBC_WF1X	2016	0.2	3	0.33	0.51	0.39	6	0.49	5.54	2.85	5	0
BBC_WF1X	2017	0.2	5	0.25	0.55	0.44	6	1.67	4.94	2.85	6	0
BBC_WF1X	2019	0.2	1	0.39	0.39	0.39	1	3.73	3.73	3.73	1	0
BBC_WF2	2015	0.2	8	0.62	1.31	0.91	11	0.87	30.94	12.83	4	5
BBC_WF2	2016	0.2	8	0.34	1.24	0.67	12	0.97	41.47	7.76	8	2
BBC_WF2	2017	0.2	8	0.50	0.90	0.74	10	1.23	27.15	8.32	4	2
BBC_WF2	2018	0.2	4	0.67	0.91	0.75	4	8.33	17.40	13.62	0	3
BBC_WF2	2019	0.2	2	0.65	0.72	0.69	3	8.66	14.67	11.12	0	1
BBC_WF4X	2015	0.2	3	0.33	0.71	0.55	4	3.90	14.23	9.24	1	2
BBC_WF4X	2016	0.2	3	0.32	0.42	0.35	6	0.34	5.60	2.83	5	0
BBC_WF4X	2017	0.2	3	0.30	0.81	0.53	7	0.96	6.77	3.60	6	0
BBC_WF4X	2019	0.2	--	--	--	--	1	5.77	5.77	5.77	0	0
BBC_WF5N	2015	0.2	2	0.30	0.32	0.31	4	2.29	7.90	5.76	1	0
BBC_WF5N	2016	0.2	--	--	--	--	4	1.80	5.48	3.30	3	0
BBC_WF5N	2017	0.2	1	0.34	0.34	0.34	3	2.44	4.67	3.45	3	0
BBC_WF5N	2018	0.2	1	0.33	0.33	0.33	4	2.30	4.96	3.43	4	0
BBC_WF5N	2019	0.2	--	--	--	--	3	3.72	6.34	5.03	2	0
BBC_WF6	2015	0.2	7	0.21	0.52	0.34	8	2.94	15.35	5.47	6	1
BBC_WF6	2016	0.2	3	0.25	0.38	0.31	10	1.20	6.95	3.48	9	0
BBC_WF6	2017	0.2	4	0.22	0.46	0.33	8	1.31	4.64	2.90	8	0
BBC_WF6	2018	0.2	2	0.25	0.26	0.26	4	1.85	3.96	3.12	4	0

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_WF6	2019	0.2	--	--	--	--	3	3.66	5.81	4.80	2	0
BBC_WF9N	2015	0.2	7	0.20	0.50	0.31	8	2.40	6.10	3.79	7	0
BBC_WF9N	2016	0.2	2	0.33	0.43	0.38	4	3.12	4.19	3.64	4	0
BBC_WF9N	2017	0.2	2	0.34	0.35	0.35	3	3.13	4.36	3.55	3	0
BBC_WF9N	2018	0.2	1	0.26	0.26	0.26	4	1.25	3.67	2.85	4	0
BBC_WF9N	2019	0.2	--	--	--	--	2	3.46	5.99	4.73	1	0
BBC_WF9X	2015	0.2	--	--	--	--	3	0.67	1.03	0.84	3	0
BBC_WF9X	2016	0.2	3	0.30	0.34	0.32	8	0.69	3.22	1.45	8	0
BBC_WF9X	2017	0.2	2	0.20	0.45	0.33	7	1.31	3.31	2.26	7	0
BBC_WF9X	2019	0.2	1	0.31	0.31	0.31	1	3.14	3.14	3.14	1	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_WF11	07/18/16	07/18/16	1	1.0	1.0	1.0
BBC_WF11	07/20/17	07/20/17	1	1.2	1.2	1.2
BBC_WF11	08/07/18	08/07/18	1	1.3	1.3	1.3
BBC_WF11	08/15/19	08/15/19	1	1.4	1.4	1.4
BBC_WF1N	07/27/15	08/25/15	2	1.7	2.0	1.9
BBC_WF1N	07/05/16	08/15/16	4	0.5	2.0	1.5
BBC_WF1N	07/06/17	07/20/17	2	1.8	2.1	2.0
BBC_WF1N	07/10/18	08/21/18	4	1.8	2.3	2.0
BBC_WF1N	07/25/19	08/15/19	2	2.0	2.3	2.1
BBC_WF1X	06/19/15	09/24/15	17	0.8	2.7	1.7
BBC_WF1X	06/01/16	09/12/16	5	1.2	2.0	1.6
BBC_WF1X	06/20/17	09/07/17	7	1.1	2.0	1.6
BBC_WF1X	07/14/18	09/11/18	3	1.2	1.6	1.4
BBC_WF1X	08/02/19	09/23/19	8	1.3	1.8	1.6
BBC_WF2	07/02/15	08/14/15	4	0.9	1.7	1.4
BBC_WF2	07/05/16	09/01/16	3	0.6	1.2	0.9
BBC_WF2	08/07/17	09/06/17	3	1.4	1.5	1.4
BBC_WF2	06/27/18	09/11/18	3	1.1	1.8	1.5
BBC_WF2	07/03/19	09/23/19	7	0.8	1.5	1.2
BBC_WF4X	09/01/16	09/12/16	2	1.2	1.9	1.5
BBC_WF4X	08/07/17	08/21/17	2	1.6	2.0	1.8
BBC_WF4X	08/02/19	08/02/19	1	1.7	1.7	1.7
BBC_WF6	09/24/15	09/24/15	1	1.9	1.9	1.9
BBC_WF6	07/18/16	08/15/16	3	1.4	1.5	1.4
BBC_WF6	07/10/18	08/21/18	2	1.2	1.5	1.3
BBC_WF9N	07/06/17	08/17/17	2	1.6	2.1	1.8
BBC_WF9N	07/10/18	07/10/18	1	2.2	2.2	2.2
BBC_WF9N	08/15/19	08/15/19	1	1.9	1.9	1.9

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_WF9X	06/20/17	09/06/17	2	1.1	2.2	1.6
BBC_WF9X	06/27/18	08/15/18	3	0.8	1.5	1.1
BBC_WF9X	06/04/19	08/13/19	2	1.3	1.5	1.4

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_MAC1	07/13/15	08/25/15	0.1	4	0.038	0.068	0.048
BBC_MAC1	07/05/16	08/15/16	0.1	4	0.022	0.044	0.034
BBC_MAC1	07/06/17	08/17/17	0.1	4	0.007	0.025	0.019
BBC_MAC1	07/10/18	08/21/18	0.1	4	0.004	0.027	0.012
BBC_MAC1	07/11/19	08/15/19	0.1	4	0.011	0.027	0.019
BBC_WF11	07/13/15	08/25/15	0.2	4	0.007	0.018	0.013
BBC_WF11	07/05/16	08/15/16	0.2	4	0.004	0.012	0.008
BBC_WF11	07/06/17	08/17/17	0.2	4	0.004	0.014	0.007
BBC_WF11	07/10/18	08/21/18	0.2	4	0.004	0.012	0.006
BBC_WF11	07/25/19	08/15/19	0.2	3	0.004	0.005	0.004
BBC_WF1N	07/13/15	08/25/15	0.2	4	0.006	0.018	0.013
BBC_WF1N	07/05/16	08/15/16	0.2	4	0.007	0.009	0.008
BBC_WF1N	07/06/17	08/17/17	0.2	3	0.004	0.013	0.008
BBC_WF1N	07/10/18	08/21/18	0.2	4	0.004	0.006	0.005
BBC_WF1N	07/25/19	08/15/19	0.2	2	0.004	0.004	0.004
BBC_WF1X	06/16/15	09/24/15	0.2	4	0.007	0.097	0.038
BBC_WF1X	01/06/16	09/26/16	0.2	6	0.004	0.015	0.009
BBC_WF1X	03/08/17	09/19/17	0.2	6	0.005	0.022	0.012
BBC_WF1X	08/08/19	08/08/19	0.2	1	0.021	0.021	0.021
BBC_WF2	06/16/15	12/09/15	0.2	11	0.007	0.265	0.055
BBC_WF2	01/06/16	09/26/16	0.2	12	0.004	0.020	0.012
BBC_WF2	01/09/17	09/19/17	0.2	10	0.006	0.064	0.023
BBC_WF2	07/10/18	08/21/18	0.2	4	0.005	0.019	0.010
BBC_WF2	07/25/19	08/15/19	0.2	3	0.004	0.022	0.013
BBC_WF4X	06/16/15	09/24/15	0.2	4	0.004	0.030	0.017
BBC_WF4X	01/06/16	09/26/16	0.2	6	0.004	0.047	0.014
BBC_WF4X	01/09/17	09/19/17	0.2	7	0.004	0.011	0.007
BBC_WF4X	08/08/19	08/08/19	0.2	1	0.004	0.004	0.004
BBC_WF5N	07/13/15	08/25/15	0.2	4	0.007	0.017	0.011
BBC_WF5N	07/05/16	08/15/16	0.2	4	0.005	0.006	0.005
BBC_WF5N	07/06/17	08/17/17	0.2	3	0.004	0.007	0.006
BBC_WF5N	07/10/18	08/21/18	0.2	4	0.004	0.005	0.004
BBC_WF5N	07/25/19	08/15/19	0.2	3	0.004	0.004	0.004
BBC_WF6	06/16/15	09/24/15	0.2	8	0.006	0.135	0.026
BBC_WF6	01/06/16	09/26/16	0.2	10	0.004	0.013	0.006

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_WF6	01/09/17	09/18/17	0.2	8	0.004	0.008	0.006
BBC_WF6	07/10/18	08/21/18	0.2	4	0.004	0.004	0.004
BBC_WF6	07/25/19	08/15/19	0.2	3	0.004	0.004	0.004
BBC_WF9N	06/16/15	09/24/15	0.2	8	0.005	0.070	0.020
BBC_WF9N	07/05/16	08/15/16	0.2	4	0.004	0.012	0.007
BBC_WF9N	07/06/17	08/17/17	0.2	3	0.004	0.006	0.005
BBC_WF9N	07/10/18	08/21/18	0.2	4	0.004	0.004	0.004
BBC_WF9N	07/25/19	08/15/19	0.2	2	0.004	0.004	0.004
BBC_WF9X	10/09/15	12/09/15	0.2	3	0.011	0.019	0.015
BBC_WF9X	01/06/16	09/26/16	0.2	8	0.004	0.012	0.007
BBC_WF9X	01/09/17	09/19/17	0.2	7	0.004	0.015	0.007
BBC_WF9X	08/08/19	08/08/19	0.2	1	0.004	0.004	0.004

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in West Falmouth Harbor (MA95-22); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
West Falmouth Harbor (MA95-22): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2526 sq mi (86%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB51.0	North Falmouth Outer Harbor	Approved	0.00005	0.0%
BB54.0	West Falmouth Harbor	Conditionally Approved	0.21857	74.6%
BB54.1	Snug Harbor East	Prohibited	0.03396	11.6%
BB54.2	West Falmouth Harbor	Restricted	0.00001	0.0%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for West Falmouth Harbor (MA95-22) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There is one beach in West Falmouth Harbor, Falmouth (MA95-22) known as “Chapoquoit Associates - Little Beach” (ID 2822) and it was never posted with any advisories for swimming between 2014 and 2019.</p> <p>The Primary Contact Recreational Use for West Falmouth Harbor (MA95-22) is assessed as Fully Supporting since there were no swimming advisory postings at the Chapoquoit Associates - Little Beach between 2014 and 2019.</p>	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2822	Chapoquoit Associates - Little Beach/Falmouth	41.60559	-70.64650	41.60475	-70.64460	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
<p>West Falmouth Harbor (MA95-22): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2526 sq mi (86%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.</p>

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There is one beach in West Falmouth Harbor, Falmouth (MA95-22) known as “Chapoquoit Associates - Little Beach” (ID 2822) and it was never posted with any advisories for swimming between 2014 and 2019.</p> <p>The Secondary Contact Recreational Use for West Falmouth Harbor (MA95-22) is assessed as Fully Supporting since there were no swimming advisory postings at the Chapoquoit Associates - Little Beach between 2014 and 2019.</p>	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
<p>West Falmouth Harbor (MA95-22): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.2526 sq mi (86%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.</p>

Westport River (MA95-54)

Location:	From the confluences of the East Branch Westport River and the West Branch Westport River to Rhode Island Sound (at a line from the southwestern tip of Horseneck Point to the easternmost point near Westport Light), Westport (includes Westport Harbor and Hulda Cove).
AU Type:	ESTUARY
AU Size:	0.74 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	Fecal Coliform	36172	Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			

Recommendations

2022 Recommendations
ALU: Continue to conduct monitoring to evaluate any nutrient related stress in the Westport River system.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Fully Supporting	YES
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an increase (~27%) of eelgrass bed habitat in the Westport River between 1995 and 2017 (0.09mi² to 0.11mi², respectively). The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at six locations throughout the Westport River, Westport (MA95-54) in the summers of 2015-2019. The sites, landward to seaward, are as follows: BBC_109E, E26, W6, 114W, 111W, and N12. Three of the sample stations (109E, 114W, and 111W) were close to shore (from jetties, docks and beaches) while the other three stations were located further from shore in deeper waters. Monitoring was conducted near the surface at all locations and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 24.7°C (n=371). The minimum dissolved oxygen (DO), measured only at shoreline sample stations, was 3.0mg/L (n=343), and was <6.0mg/L 34 times (9.9% of the measurements overall but occurring most frequently at the two inner-most shoreline stations BBC_109E and 114W) and <5.0mg/L five times (only in 2018 at BBC_114W). Total nitrogen sampling (n=73, maximum of 1.42mg/L at BBC_111W in 2015) during ebb tides in July through September documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.28 and 0.72mg/L; >0.40mg/L nearly half (nine of 20) of the time however, chlorophyll *a* concentrations (n=93) were generally not indicative of nutrient enrichment (concentrations >10µg/L documented only once at BBC_111W in 2015 at 35.5µg/L). Secchi disk depth ranged from 0.5 to 3.7m (n=131) with yearly averages at sites with at least three measurements ranging from 1.2 to 2.8m. Ammonia-nitrogen concentrations ranged from 0.004 to 0.1mg/L (n=93), though TUs for ammonia-nitrogen could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for the Westport River (MA95-54) will continue to be assessed as Fully Supporting based on the increase of eelgrass bed habitat documented by the MassDEP between 1995 and 2017. Alerts are being identified for Total Nitrogen and occasionally low DO documented by BBC staff/volunteers.

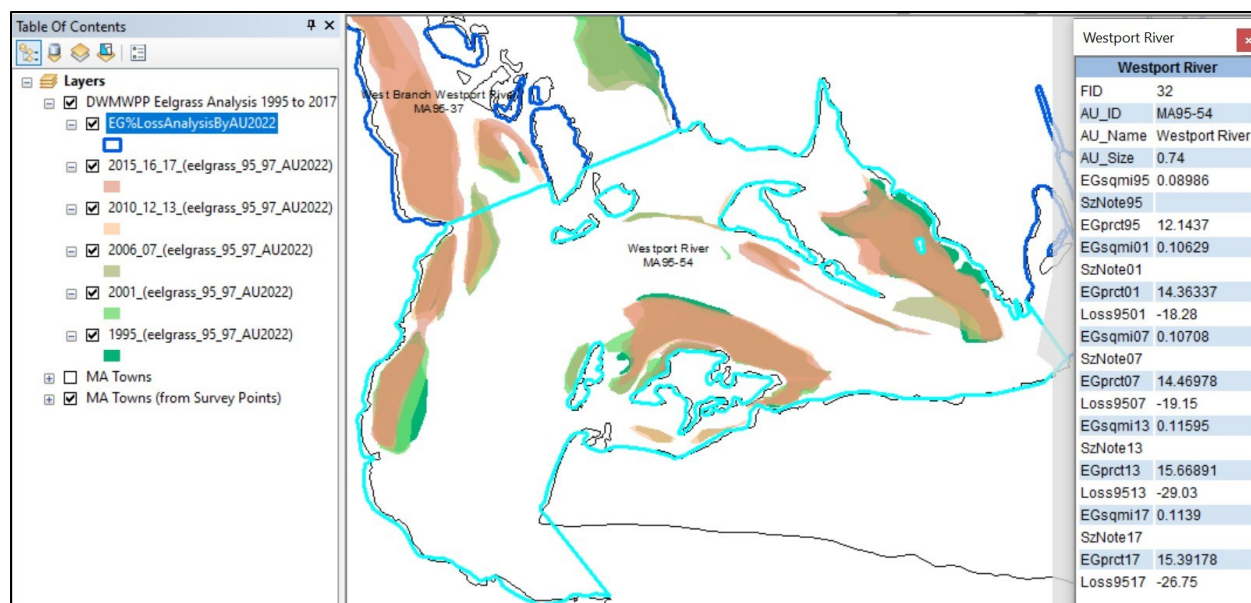
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_109E	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Outer, Westport	41.515784	-71.071075
BBC_111W	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River E-W Inlet, Westport	41.508049	-71.092186
BBC_114W	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River West Inner, Westport	41.51763	-71.095379
BBC_E26	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River East Outer, Westport	41.514926	-71.07035
BBC_N12	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River E-W Inlet, Westport	41.509257	-71.091253
BBC_W6	Buzzards Bay Coalition	Water Quality	Westport Rivers	Westport River West, Westport	41.518558	-71.0932

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for the Westport River MA95-54 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an increase of eelgrass bed habitat in the Westport River between 1995 and 2017 (0.09 miles² to 0.11 miles², respectively).

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_109E	06/29/15	12/09/15	0.6	5	6.7	8.1	0	0	0
BBC_109E	05/29/15	09/23/15	1.8	17	6.0	9.0	0	0	0
BBC_109E	01/06/16	06/15/16	0.2	2	7.6	8.9	0	0	0
BBC_109E	01/09/17	08/02/17	0.2	15	5.0	7.2	20	0	0
BBC_109E	05/31/17	08/02/17	2.3	13	3.0	6.3	15	8	8
BBC_109E	06/05/18	09/19/18	0.2	20	5.0	6.5	15	0	0
BBC_109E	06/05/18	09/19/18	2.0	20	4.5	6.3	20	5	0
BBC_109E	05/30/19	09/23/19	0.2	22	5.0	7.0	9	0	0
BBC_109E	05/30/19	09/23/19	1.6	22	6.0	6.9	0	0	0
BBC_111W	05/29/15	09/23/15	0.3	16	6.0	7.4	0	0	0
BBC_111W	05/29/15	09/23/15	1.7	15	6.0	7.6	0	0	0
BBC_111W	06/15/16	07/12/16	0.2	2	7.6	7.8	0	0	0
BBC_111W	07/21/17	09/13/17	0.2	10	5.0	8.2	10	0	0
BBC_111W	07/21/17	08/16/17	1.6	6	6.5	8.3	0	0	0
BBC_111W	07/29/18	09/19/18	0.2	8	6.0	7.1	0	0	0
BBC_111W	07/29/18	09/19/18	1.4	14	4.5	6.9	7	7	0
BBC_111W	07/26/19	09/24/19	0.2	11	7.0	7.9	0	0	0
BBC_111W	08/22/19	09/24/19	1.9	7	7.5	8.1	0	0	0
BBC_114W	07/02/15	09/14/15	0.2	3	6.0	6.8	0	0	0
BBC_114W	05/28/15	09/23/15	0.6	21	6.0	7.5	0	0	0
BBC_114W	08/16/16	08/31/16	0.2	2	5.0	5.5	50	0	0
BBC_114W	06/01/16	09/25/16	0.6	21	5.5	6.5	19	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_114W	06/07/17	09/20/17	0.2	6	6.0	7.0	0	0	0
BBC_114W	05/31/17	09/16/17	0.6	19	5.0	6.6	16	0	0
BBC_114W	07/27/18	09/20/18	0.2	3	4.5	6.0	33	33	0
BBC_114W	05/30/18	09/20/18	0.6	21	4.5	6.4	19	5	0
BBC_114W	06/14/19	08/29/19	0.2	4	6.0	6.9	0	0	0
BBC_114W	06/04/19	09/23/19	0.7	18	5.0	6.4	28	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_109E	06/16/15	12/09/15	0.6	9	5	24.5	21.2	0
BBC_109E	05/29/15	09/23/15	1.8	17	15	25.0	20.8	0
BBC_109E	01/06/16	09/26/16	0.2	9	3	22.0	19.5	0
BBC_109E	01/09/17	09/19/17	0.2	19	15	22.0	19.6	0
BBC_109E	05/31/17	08/02/17	2.3	13	12	22.0	19.7	0
BBC_109E	06/05/18	09/19/18	0.2	20	19	25.5	22.2	0
BBC_109E	06/05/18	09/19/18	2.0	20	19	25.7	22.0	0
BBC_109E	05/30/19	09/23/19	0.2	22	19	24.5	20.4	0
BBC_109E	05/30/19	09/23/19	1.7	22	19	24.7	20.4	0
BBC_111W	05/29/15	09/24/15	0.3	19	16	25.0	20.4	0
BBC_111W	05/29/15	09/23/15	1.8	15	13	25.0	20.3	0
BBC_111W	01/06/16	09/26/16	0.2	7	4	21.0	18.6	0
BBC_111W	01/09/17	09/19/17	0.2	17	13	23.5	20.4	0
BBC_111W	07/21/17	08/16/17	1.6	6	6	24.5	21.5	0
BBC_111W	07/29/18	09/19/18	0.2	8	7	23.5	21.8	0
BBC_111W	07/29/18	09/19/18	1.4	14	13	24.2	22.5	0
BBC_111W	07/26/19	09/24/19	0.2	11	9	23.9	21.4	0
BBC_111W	08/22/19	09/24/19	1.9	7	5	23.1	20.6	0
BBC_114W	06/16/15	09/14/15	0.2	4	4	22.0	20.5	0
BBC_114W	05/28/15	09/23/15	0.7	21	18	26.0	21.7	0
BBC_114W	08/16/16	08/31/16	0.2	2	2	24.0	24.0	0
BBC_114W	06/01/16	09/25/16	0.6	21	18	24.0	20.8	0
BBC_114W	06/07/17	09/20/17	0.2	6	5	22.2	19.0	0
BBC_114W	05/31/17	09/16/17	0.6	19	17	22.5	19.6	0
BBC_114W	07/27/18	09/20/18	0.2	3	2	23.8	21.4	0
BBC_114W	05/30/18	09/20/18	0.6	21	18	24.1	20.8	0
BBC_114W	06/14/19	08/29/19	0.2	4	4	21.3	19.8	0
BBC_114W	06/04/19	09/23/19	0.7	18	16	23.0	20.4	0
BBC_E26	07/13/15	08/25/15	0.2	4	4	27.0	24.5	0
BBC_E26	07/05/16	08/15/16	0.2	4	4	27.0	24.0	0
BBC_E26	07/06/17	08/17/17	0.2	3	3	24.9	23.4	0
BBC_E26	07/10/18	08/21/18	0.2	4	4	25.5	23.2	0
BBC_E26	07/11/19	08/15/19	0.2	4	4	23.8	23.0	0
BBC_N12	07/13/15	08/25/15	0.2	3	3	26.0	23.3	0
BBC_N12	07/05/16	08/15/16	0.2	4	4	26.0	23.8	0
BBC_N12	07/06/17	08/17/17	0.2	3	3	23.9	23.0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_N12	07/10/18	08/21/18	0.2	4	4	25.0	23.4	0
BBC_N12	07/11/19	08/15/19	0.2	4	4	23.0	22.4	0
BBC_W6	07/13/15	08/25/15	0.2	3	3	27.0	24.7	0
BBC_W6	07/05/16	08/15/16	0.2	4	4	28.0	24.3	0
BBC_W6	07/06/17	08/17/17	0.2	3	3	24.9	23.9	0
BBC_W6	07/10/18	08/21/18	0.2	4	4	26.0	23.9	0
BBC_W6	07/11/19	08/15/19	0.2	4	4	23.5	22.9	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_109E	2015	0.2	4	0.28	0.36	0.30	7	0.69	4.71	2.10	7	0
BBC_109E	2016	0.2	4	0.21	0.58	0.35	9	0.75	4.21	1.79	9	0
BBC_109E	2017	0.2	4	0.30	0.52	0.40	6	0.80	3.36	2.13	6	0
BBC_111W	2015	0.2	3	0.30	1.42	0.72	4	1.94	35.49	11.93	2	1
BBC_111W	2016	0.1	3	0.19	0.69	0.39	6	0.21	2.69	1.59	6	0
BBC_111W	2017	0.2	4	0.24	0.68	0.48	6	0.49	4.15	2.18	6	0
BBC_E26	2015	0.2	4	0.31	0.43	0.38	4	1.91	4.21	2.90	4	0
BBC_E26	2016	0.2	4	0.27	0.49	0.38	4	1.08	3.11	1.71	4	0
BBC_E26	2017	0.2	3	0.54	0.66	0.60	3	3.72	7.23	4.99	2	0
BBC_E26	2018	0.2	3	0.28	0.31	0.29	4	1.64	4.40	3.02	4	0
BBC_E26	2019	0.2	4	0.24	0.69	0.42	4	1.49	3.45	2.17	4	0
BBC_N12	2015	0.2	3	0.28	0.52	0.41	3	1.63	3.40	2.31	3	0
BBC_N12	2016	0.2	4	0.24	0.55	0.37	4	0.95	2.27	1.53	4	0
BBC_N12	2017	0.2	3	0.43	0.51	0.48	3	2.43	6.10	4.04	2	0
BBC_N12	2018	0.2	3	0.24	0.34	0.28	4	1.12	4.96	3.13	4	0
BBC_N12	2019	0.2	4	0.20	0.65	0.43	4	0.23	2.75	1.70	4	0
BBC_W6	2015	0.2	2	0.40	0.82	0.61	3	2.99	5.16	3.92	2	0
BBC_W6	2016	0.2	4	0.30	0.51	0.39	4	1.54	3.15	2.10	4	0
BBC_W6	2017	0.2	3	0.56	0.68	0.63	3	4.61	5.91	5.28	1	0
BBC_W6	2018	0.2	3	0.32	0.42	0.38	4	1.90	5.11	3.41	3	0
BBC_W6	2019	0.2	4	0.27	0.89	0.47	4	1.80	4.75	2.95	4	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_109E	06/04/15	10/09/15	14	1.5	3.5	2.0

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_109E	01/06/16	09/26/16	6	0.7	2.7	1.6
BBC_109E	01/09/17	09/19/17	16	0.7	2.8	1.9
BBC_109E	06/05/18	09/19/18	13	1.3	2.9	2.2
BBC_109E	06/20/19	06/20/19	1	1.6	1.6	1.6
BBC_111W	06/16/15	09/24/15	5	1.7	3.7	2.2
BBC_111W	06/01/16	09/26/16	4	1.7	2.9	2.2
BBC_111W	06/06/17	09/13/17	6	0.5	1.9	1.2
BBC_111W	07/29/18	09/19/18	3	1.1	2.0	1.7
BBC_111W	07/26/19	09/24/19	2	1.5	1.5	1.5
BBC_114W	06/16/15	09/14/15	3	1.0	1.3	1.2
BBC_114W	09/05/17	09/05/17	1	1.3	1.3	1.3
BBC_114W	09/11/18	09/11/18	1	0.6	0.6	0.6
BBC_114W	06/14/19	06/14/19	1	1.3	1.3	1.3
BBC_E26	07/13/15	08/25/15	4	2.3	3.1	2.7
BBC_E26	07/05/16	08/15/16	4	1.9	3.3	2.8
BBC_E26	07/06/17	08/17/17	3	1.9	2.0	1.9
BBC_E26	07/10/18	08/21/18	4	1.3	2.3	2.0
BBC_E26	07/11/19	08/15/19	4	0.9	3.6	2.2
BBC_N12	07/13/15	08/25/15	3	2.5	3.5	3.2
BBC_N12	07/05/16	08/15/16	4	2.5	3.4	3.1
BBC_N12	07/06/17	08/17/17	3	2.0	2.7	2.3
BBC_N12	07/10/18	08/21/18	4	1.8	2.5	2.3
BBC_N12	07/11/19	08/15/19	4	1.4	4.1	2.6
BBC_W6	07/13/15	08/25/15	3	2.2	2.7	2.4
BBC_W6	07/05/16	08/15/16	4	1.7	2.7	2.3
BBC_W6	07/06/17	08/17/17	3	1.1	3.5	2.0
BBC_W6	07/10/18	08/21/18	4	1.5	2.2	1.8
BBC_W6	07/11/19	08/15/19	4	0.6	2.4	1.7

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_109E	06/16/15	12/09/15	0.2	7	0.014	0.050	0.025
BBC_109E	01/06/16	09/26/16	0.2	9	0.004	0.057	0.024
BBC_109E	01/09/17	09/19/17	0.2	6	0.006	0.046	0.020
BBC_111W	06/16/15	09/24/15	0.2	4	0.007	0.104	0.040
BBC_111W	01/06/16	09/26/16	0.1	6	0.004	0.042	0.021
BBC_111W	01/09/17	09/19/17	0.2	6	0.009	0.062	0.029
BBC_E26	07/13/15	08/25/15	0.2	4	0.013	0.032	0.022
BBC_E26	07/05/16	08/15/16	0.2	4	0.010	0.039	0.021
BBC_E26	07/06/17	08/17/17	0.2	3	0.010	0.013	0.012

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_E26	07/10/18	08/21/18	0.2	4	0.004	0.009	0.006
BBC_E26	07/11/19	08/15/19	0.2	4	0.012	0.032	0.020
BBC_N12	07/13/15	08/25/15	0.2	3	0.016	0.022	0.019
BBC_N12	07/05/16	08/15/16	0.2	4	0.006	0.071	0.025
BBC_N12	07/06/17	08/17/17	0.2	3	0.006	0.012	0.008
BBC_N12	07/10/18	08/21/18	0.2	4	0.004	0.011	0.007
BBC_N12	07/11/19	08/15/19	0.2	4	0.009	0.030	0.015
BBC_W6	07/13/15	08/25/15	0.2	3	0.014	0.041	0.027
BBC_W6	07/05/16	08/15/16	0.2	4	0.011	0.019	0.014
BBC_W6	07/06/17	08/17/17	0.2	3	0.005	0.008	0.006
BBC_W6	07/10/18	08/21/18	0.2	4	0.005	0.017	0.011
BBC_W6	07/11/19	08/15/19	0.2	4	0.008	0.029	0.017

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in the Westport River (MA95-54); therefore the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Westport River (MA95-54): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.7135 sq mi (97%). The approved shellfish growing area represents 0.1917 sq mi (26%). The Shellfish Harvesting Use is assessed as not supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB1.0	Westport South Coastal	Approved	0.00202	0.3%
BB3.0	Corey's Island	Approved	0.10003	13.5%
BB3.1	Westport Harbor Mooring Area	Conditionally Approved	0.29280	39.6%
BB3.31	Point Bial	Prohibited	0.19282	26.1%
BB3.37	Main Road	Conditionally Approved	0.00025	0.0%
BB3.39	Canoe Rock	Approved	0.08808	11.9%
BB3.40	West of Route 88 Bridge	Approved	0.00157	0.2%
BB3.5	Tripps Marina & Westport Yacht Club	Prohibited	0.03591	4.9%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for the Westport River (MA95-54) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There are three beaches in the Westport River, Westport AU (MA95-54)--the names and ID codes for the beaches are as follows: Town Yacht (ID 3205), Spindle Rock (ID 3200), and Cherry and Webb Beach (ID 3211). None of the beaches were ever posted with any advisories for swimming between 2014 and 2019.</p> <p>The Primary Contact Recreational Use for the Westport River (MA95-54) is assessed as Fully Supporting, since there were no swimming advisory postings at the Town Yacht, Spindle Rock, and Cherry and Webb beaches between 2014 and 2019.</p>	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
3200	Spindle Rock/Westport	41.51309	-71.09780	41.51030	-71.09740	0%	0%	0%	0%	0%	0%	0
3205	Town-Yacht/Westport	41.51334	-71.07570	41.51343	-71.07540	0%	0%	0%	0%	0%	0%	0
3211	Cherry and Webb/Westport	41.51200	-71.08940	41.50896	-71.07510	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Westport River (MA95-54): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.7135 sq mi (97%). The approved shellfish growing area represents 0.1917 sq mi (26%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	

There are three beaches in the Westport River, Westport AU (MA95-54)--the names and ID codes for the beaches are as follows: Town Yacht (ID 3205), Spindle Rock (ID 3200), and Cherry and Web Beach (ID 3211). None of the beaches were ever posted with any advisories for swimming between 2014 and 2019.

The Secondary Contact Recreational Use for the Westport River AU (MA95-54) is assessed as Fully Supporting since there were no swimming advisory postings at the Town Yacht, Spindle Rock, and Cherry and Webb beaches between 2014 and 2019.

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

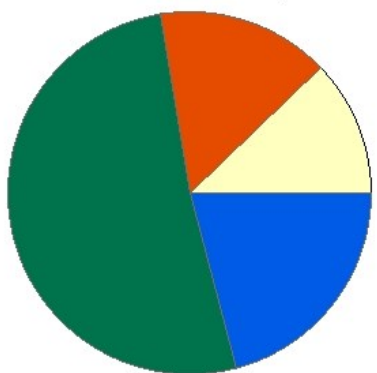
Summary
Westport River (MA95-54): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.7135 sq mi (97%). The approved shellfish growing area represents 0.1917 sq mi (26%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Weweantic River (MA95-04)

Location:	Headwaters confluence of Rocky Meadow and South Meadow brooks, Carver to the inlet of Horseshoe Pond, Wareham (through former 2014 segment: Tremont Mill Pond MA95150).
AU Type:	RIVER
AU Size:	11.5 MILES
Classification/Qualifier:	B: WWF, HQW

Weweantic River - MA95-04

Watershed Area: 56.8 square miles



Percent Agriculture
 Percent Natural
 Percent Developed
 Percent Wetland

Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	56.8	4.51	25.65	2.55
Agriculture	12.1%	9.6%	23.7%	16.6%
Developed	15.5%	24.4%	12.4%	14.4%
Natural	51.6%	51.3%	43.1%	48.7%
Wetland	20.8%	14.7%	20.7%	20.2%
Impervious Cover	5.8%			

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Fish Passage Barrier*)		Added
5	5	(Non-Native Aquatic Plants*)		Unchanged
5	5	Enterococcus		Unchanged

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Fish Passage Barrier*)	Hydrostructure Impacts on Fish Passage (Y)	X				
(Non-Native Aquatic Plants*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
Enterococcus	Source Unknown (N)				X	

Recommendations

2022 Recommendations
ALU: Conduct an aquatic macrophyte survey in Tremont Mill Pond when flowering heads are present to confirm the presence of the non-native <i>Myriophyllum heterophyllum</i> in the pond (the 1995 field sheet said "likely heterophyllum") (confirmation of any non-native species should be made by a qualified state agency/taxonomist). Also conduct water quality monitoring, (especially for pH and nutrients) to confirm the nature and extent of potential nutrient enrichment and pH impairments for this Weweantic River AU (MA95-04).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
<p>MA DFG biologists conducted backpack electrofishing at three sites along this Weweantic River AU (MA95-04), Wareham in October 2017; two sites close together upstream of the impoundment locally known as Tremont Mill Pond, downstream of the dam at Birch Island Conservation Land (SampleID 6959) and up/downstream the Rt.28 bridge (SampleID 6958), and further downstream of the Tremont Mill Pond near the Paper Mill Rd crossing (SampleID 6957). All three samples were collected in low gradient stream reaches and were indicative of healthy conditions, with samples up and downstream of the pond containing a fluvial specialist (tessellated darter) and all three samples containing moderately tolerant/intolerant macrohabitat generalists (in albeit small numbers including alewife, largemouth bass, chain pickerel, and pumpkinseed) comprising 4%, 19% and 1% of the samples, respectively. DMF biologists note one structure causing passage limitation to diadromous fish in the downstream half of this Weweantic River AU. The Tremont Mill Pond Dam (NATID# MA00767) located downstream of Main Street in West Wareham, was given a passage score of "10" on a 0-10 scale, indicating that the dam allows no possible passage of the targeted fish species, river herring and lamprey. The population score was "2". It was noted by DMF that the dam height is (24 ft), which would make the construction of any passage improvement structure a costly and difficult prospect. It was further noted that water level rises are anticipated with the 2020 removal of Horseshoe Dam further downstream on the Weweantic River AU (MA95-05), which could possibly assist this conceptual project. The presence of the non-native aquatic macrophyte, variable milfoil (<i>Myriophyllum heterophyllum</i>), was previously reported in the Tremont Mill Pond impoundment (formerly MA95150, but merged with MA95-04 Weweantic River in the 2016 IR reporting cycle) based on an August 1995 synoptic survey conducted by MassDEP staff.</p> <p>The Aquatic Life Use for this Weweantic River AU (MA95-04) is assessed as Not Supporting. The non-native aquatic macrophyte impairment is being carried forward due to the presence of variable milfoil in the Tremont Mill Pond impoundment. A Fish Passage Barrier impairment is also being added based on the barrier to diadromous fish passage at the Tremont Mill Pond Dam. The prior Alerts for low pH, elevated nutrients (total phosphorus and total nitrogen for downstream estuarine segments), and instream flow regimes (affected by the numerous cranberry bog operations) are all being carried forward.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
6957	MassDFG	Fish Community	Weweantic River	Paper Mill Rd xing DS @ start of reach, Wareham	41.77917	-70.76349
6958	MassDFG	Fish Community	Weweantic River	ds + us rt 28 bridge, Wareham	41.79800	-70.76400
6959	MassDFG	Fish Community	Weweantic River	DS dam at Birch Island Conservation Land, immediately DS pond & gate, Wareham	41.79874	-70.76331

Biological Monitoring Information

Fish Community Data and DELTS

Fish Community Data (2012-2019) Provided by MassDFG. (MassDFG 2020) (MassDEP Undated3)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net, Gradient: H = High, L = Low; I/MT MG= Intolerant/Moderately Tolerant Macrohabitat Generalist]

[Species List: A = Alewife, AE = American Eel, B = Bluegill, BB = Brown Bullhead, CP = Chain Pickerel, GS = Golden Shiner, K = Banded Killifish, LMB = Largemouth Bass, M = Mummichog, P = Pumpkinseed, SL = Sea Lamprey, TD = Tessellated Darter]

Sample ID	Sample Date	Method	Sample Type	Gradient	Total Taxa	Total Ind	Cold Ind %	Fluvial Taxa	Fluvial Ind %	Intol Ind %	I/MT MG Taxa	I/MT MG Ind %	Notables	CFR	Species List
6957	10/05/17	BP	TP		5	115	0%	1	6%	0%	1	1%	No	No	AE, B, LMB, SL, TD,
6958	10/05/17	BP	TP		7	27	0%	1	15%	0%	3	19%	No	No	AE, B, CP, GS, LMB, P, TD,
6959	10/05/17	BP	TP		7	56	0%	0	0%	0%	2	4%	No	No	A, AE, B, BB, K, LMB, M,

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note one structure causing passage limitation to diadromous fish in the downstream half of the Weweantic River AU. The Tremont Mill Pond Dam (NATID# MA00767) located downstream of Main Street in West Wareham, was given a passage score of "10" on a 0-10 scale, indicating that the dam allows no possible passage of the targeted fish species, river herring and lamprey. The population score was noted to be "2" in this area. It was noted by DMF that the dam height is (24 ft), which would make the construction of any passage improvement structure a costly and difficult prospect. It was further noted that water level rises are anticipated with the 2020 removal of Horseshoe Dam (on MA95-05), which could possibly assist this conceptual project. The Aquatic Life Use for Weweantic River (Assessment Unit MA95-04) is assessed as Not Supporting, based on the barrier to diadromous fish passage at the Tremont Mill Pond Dam.

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995)

Summary Statement	Assessment Recommendation
The presence of the non-native aquatic macrophyte, variable milfoil (<i>Myriophyllum heterophyllum</i>), was previously reported in Tremont Mill Pond (formerly MA95150, but merged with MA95-04 Weweantic River as of the 2016 IR cycle) following an August 1995 synoptic survey conducted by MassDEP staff.	Conduct an aquatic macrophyte survey in Tremont Mill Pond when flowering heads are present to confirm the presence of the non-native <i>Myriophyllum heterophyllum</i> in the pond (the 1995 field sheet said "likely heterophyllum").

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in this Weweantic River AU (MA95-04); therefore, the Fish Consumption Use is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO

2022 Use Attainment Summary

No recent data are available to assess the status of the Aesthetic Use for this Weweantic River AU (MA95-04) so it is Not Assessed.

Primary Contact Recreation

2022 Use Attainment

Not Supporting

Alert

NO

2022 Use Attainment Summary

No recent *Enterococci* or *E. coli* bacteria data are available to assess the status of the Primary Contact Recreation Use for this Weweantic River AU (MA95-04) so it will continue to be assessed as Not Supporting with the *Enterococcus* impairment being carried forward.

Secondary Contact Recreation

2022 Use Attainment

Not Assessed

Alert

NO

2022 Use Attainment Summary

No recent *E. coli* bacteria data are available to assess the Secondary Contact Recreational Use for this Weweantic River AU (MA95-04) so it is Not Assessed.

Weweantic River (MA95-05)

Location:	Outlet Horseshoe Pond, Wareham to mouth at Buzzards Bay, Marion/Wareham.
AU Type:	ESTUARY
AU Size:	0.62 SQUARE MILES
Classification/Qualifier:	SA: SFO, HQW

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Dissolved Oxygen		Added
5	5	Enterococcus	36172	Unchanged
5	5	Estuarine Bioassessments		Unchanged
5	5	Fecal Coliform	36172	Unchanged
5	5	Nitrogen, Total		Unchanged
5	5	Nutrient/Eutrophication Biological Indicators		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Dissolved Oxygen	Source Unknown (N)	X					
Enterococcus	Source Unknown (N)					X	
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Source Unknown (N)	X					
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)	X					

Recommendations

2022 Recommendations
AES: Monitoring staff should document observations of water clarity in the Weweantic River AU (MA95-05) in particular in the stretch between 13th Avenue to the Rt.6 bridge, Wareham, as well as downstream of the Rt.6 bridge. Also document presence/coverage of areas and range/extent of Sea Lettuce.

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an ~78% loss of eelgrass bed habitat in this Weweantic River AU (MA95-05) between 1995 and 2017. DMF biologists note one structure causing only minimal limitation to the passage of diadromous fish at the upstream end of this Weweantic River AU (MA95-05); the remnants of the Horseshoe Pond Dam (NATID# MA00026) (removed in 2020), located just upstream of Station St., was given a passage score of "0" on a 0-10 scale (with 10 equating to no possible passage), indicating that the remnants of the dam are not an obstruction to the passage of the targeted species (river herring and rainbow smelt). The population score was "5". The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at nine locations in Wareham, throughout this Weweantic River AU in the summers of 2015-2019, from upstream to downstream as follows: at the upstream end of the AU, just downstream of the Horseshoe Pond dam at Station St. (BBC_WW0); west bank at the cranberry visitors center boat ramp (BBC_WW6); ~1000ft downstream of the boat ramp, mid-channel (BBC_WW3); from a west bank dock at Wareham Marina (BBC_WW2); just downstream of the Rt.6 bridge from an east bank beach (BBC_WW1X) and from the bridge itself (BBC_1N); in the downstream half of the AU, mid-channel off Briarwood Beach (BBC_WW4); from an east bank dock just north of Pattons Cove (BBC_WW4A); and mid-channel close to the downstream end of the AU (BBC_WW5). Monitoring was conducted in the surface waters, as well as deeper in the water column at all stations (depths 0.3m-4.7m) and was usually conducted weekly in the summer months (between 6 & 9am). The maximum temperature was 30.1°C (n=682), >29.4°C three times. The minimum dissolved oxygen (DO) was 2.7mg/L at BBC_WW0 in 2016 (n=704). Overall, DO measured <6.0mg/L 176 times (25% of all measurements occurring at all sample stations, every year, at a range of depths including surface waters) and <5.0mg/L 40 times (~6%, intermittently at all sample stations at a range of depths, except BBC_WW4A). Total nitrogen sampling (n=53, maximum of 3.88mg/L at BBC_WW1N) during ebb tides in July-August at seven of the sample stations documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.55-1.77mg/L. Chlorophyll *a* concentrations were often elevated (n=64), especially in the reach between BBC_WW6 and the Rt.6 Bridge, (usually at least two or three times a year being >10µg/L) with some extremely high concentrations documented (362, 89, 79µg/L at BBC_1N, WW6, and WW3 respectively). BBC flagged these data as unusual (but still valid), noting that the volume filtered was "below normal" in these cases and could explain higher than normal results. Aside from these anomaly's, chlorophyll *a* concentrations were >5µg/L 42 times and >10 µg/L 29 times. Secchi disk depths were measured throughout the AU, usually weekly in the summers of 2015-2019 (n=304); yearly averages ranged between 0.5 and 2.0m when n>1. Ammonia-nitrogen concentrations were generally low (n=69, range 0.005 to 0.06mg/L), however TUs could not be calculated (lack of quality assured pH and salinity data).

The Aquatic Life Use for this Weweantic River AU (MA95-05) will continue to be assessed as Not Supporting based on the loss of eelgrass bed habitat documented by the MassDEP between 1995 and 2017 and the water quality data collected by the BBC staff/volunteers in 2015-2019. The Estuarine Bioassessments and Total Nitrogen impairments are being carried forward. New impairments are being added for Nutrient/Eutrophication Biological Indicators and Dissolved Oxygen.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2501	MassDEP	Water Quality	Weweantic River	[Briarwood beach at McKinley Street, Wareham]	41.736708	-70.741795
W2502	MassDEP	Water Quality	Weweantic River	[Briarwood beach at Munroe Parkway and Washington Drive, Wareham]	41.735591	-70.741194
W2503	MassDEP	Water Quality	Weweantic River	[the eastern bank, just upstream at Route 6, Wareham]	41.738823	-70.746085
W2504	MassDEP	Water Quality	Weweantic River	[Briarwood beach at Wilson Street, Wareham]	41.738109	-70.743413

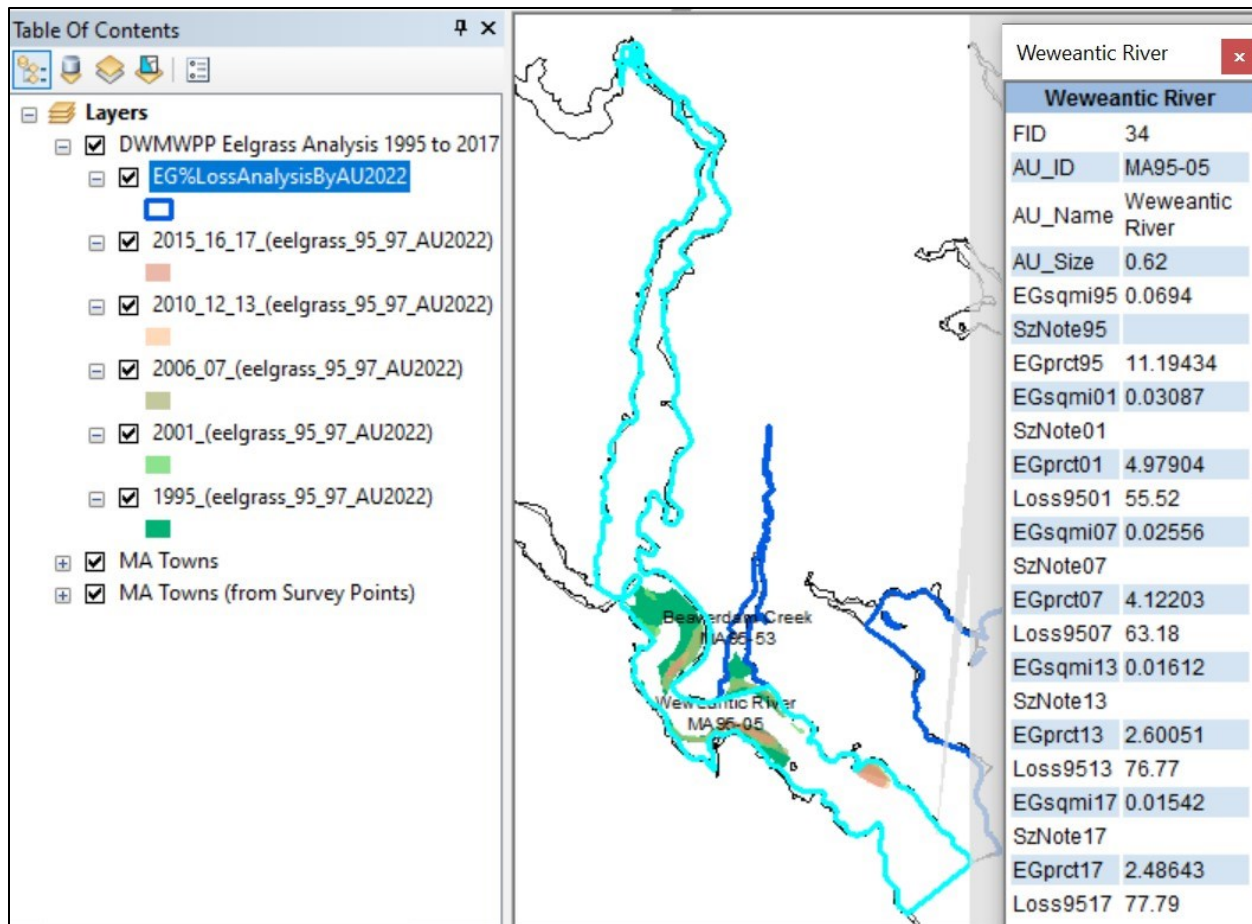
Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_WW0	Buzzards Bay Coalition	Water Quality	Weweantic River	Weweantic River Fresh, Wareham	41.765299	-70.74756

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_WW1N	Buzzards Bay Coalition	Water Quality	Weweantic River	Weweantic River Inner, Wareham	41.738524	-70.745778
BBC_WW1X	Buzzards Bay Coalition	Water Quality	Weweantic River	Weweantic River Inner, Wareham	41.738726	-70.745242
BBC_WW2	Buzzards Bay Coalition	Water Quality	Weweantic River	Weweantic River Inner, Wareham	41.744669	-70.747555
BBC_WW3	Buzzards Bay Coalition	Water Quality	Weweantic River	Weweantic River Inner, Wareham	41.746641	-70.745832
BBC_WW4	Buzzards Bay Coalition	Water Quality	Weweantic River	Weweantic River Outer, Wareham	41.732204	-70.744372
BBC_WW4A	Buzzards Bay Coalition	Water Quality	Weweantic River	Weweantic River Outer, Wareham	41.731919	-70.736873
BBC_WW5	Buzzards Bay Coalition	Water Quality	Weweantic River	Weweantic River Outer, Wareham	41.723733	-70.726659
BBC_WW6	Buzzards Bay Coalition	Water Quality	Weweantic River	Weweantic River Inner, Wareham	41.749216	-70.745789

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for the Weweantic River MA95-05 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~78% loss of eelgrass bed habitat in Weweantic River between 1995 and 2017.

Habitat and Flow Data (anthropogenic alterations)

MassDMF Status of Priority Diadromous Fish Passage Barriers. (Chase 2020)

Assessment Summary
DMF biologists note one structure causing only minimal limitation to passage of diadromous fish at the upstream end of this Weweantic River AU. The remnants of the Horseshoe Pond Dam (NATID# MA00026), located just upstream of Station Street, was given a passage score of "0" on a 0-10 scale (with 10 equating to no possible passage), indicating that the remnants of the dam are not an obstruction to the passage of the targeted species; river herring and rainbow smelt. The population score was noted to be "5". It was noted that the dam had been removed in 2020.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_WW0	06/04/15	09/04/15	0.1	14	5.4	6.4	14	0	0
BBC_WW0	06/04/15	08/25/15	0.6	4	5.9	7.1	25	0	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_WW0	06/21/16	09/07/16	0.2	12	2.8	5.5	67	25	17
BBC_WW0	08/16/16	09/01/16	0.4	2	2.7	3.4	100	100	50
BBC_WW0	08/08/17	09/21/17	0.2	7	6.6	7.3	0	0	0
BBC_WW0	05/30/18	09/19/18	0.2	21	5.0	6.7	14	0	0
BBC_WW0	06/10/19	09/23/19	0.2	20	5.5	8.7	5	0	0
BBC_WW0	06/10/19	06/10/19	0.7	1	6.8	6.8	0	0	0
BBC_WW1N	07/13/15	08/10/15	0.2	3	5.6	6.0	67	0	0
BBC_WW1N	07/05/16	08/15/16	0.2	3	5.2	5.5	100	0	0
BBC_WW1N	06/05/18	09/19/18	0.2	13	4.6	5.9	54	8	0
BBC_WW1N	06/05/18	09/19/18	4.6	13	4.3	5.5	77	23	0
BBC_WW1N	06/10/19	09/19/19	0.2	8	5.2	6.3	38	0	0
BBC_WW1N	06/10/19	09/19/19	4.4	8	3.9	5.8	38	25	13
BBC_WW1X	06/04/15	08/26/15	0.2	13	4.8	6.7	46	8	0
BBC_WW1X	06/04/15	08/26/15	2.9	13	4.6	6.3	54	8	0
BBC_WW1X	06/10/16	09/21/16	0.2	8	4.5	5.8	50	13	0
BBC_WW1X	06/10/16	09/21/16	4.8	7	4.3	5.4	71	43	0
BBC_WW1X	06/06/17	08/17/17	0.1	2	5.6	7.3	50	0	0
BBC_WW1X	06/12/17	09/21/17	0.9	16	6.0	7.0	0	0	0
BBC_WW2	06/04/15	09/21/15	0.2	13	4.3	6.5	54	8	0
BBC_WW2	06/04/15	09/21/15	1.1	13	3.4	5.7	69	23	8
BBC_WW2	06/06/16	09/14/16	0.2	14	5.3	6.0	36	0	0
BBC_WW2	06/06/16	09/14/16	1.3	9	5.0	6.0	33	0	0
BBC_WW2	06/16/17	09/21/17	0.2	7	5.1	6.6	29	0	0
BBC_WW2	06/16/17	09/21/17	1.2	7	4.6	5.9	57	14	0
BBC_WW2	05/30/18	09/20/18	0.2	11	5.5	7.1	9	0	0
BBC_WW2	05/30/18	09/20/18	1.1	22	5.0	6.6	14	0	0
BBC_WW2	06/10/19	09/22/19	0.2	12	7.5	8.7	0	0	0
BBC_WW2	06/10/19	09/14/19	1.2	6	7.0	8.1	0	0	0
BBC_WW4A	05/28/15	09/23/15	0.2	23	6.5	7.7	0	0	0
BBC_WW4A	05/28/15	09/23/15	1.8	21	6.5	7.5	0	0	0
BBC_WW4A	05/31/16	09/24/16	0.2	22	5.0	7.1	5	0	0
BBC_WW4A	05/31/16	09/24/16	1.8	22	5.0	7.0	9	0	0
BBC_WW4A	05/31/17	09/16/17	0.2	21	5.5	7.1	5	0	0
BBC_WW4A	05/31/17	09/16/17	1.8	21	5.5	6.8	10	0	0
BBC_WW4A	05/30/18	09/20/18	0.2	22	5.0	6.8	14	0	0
BBC_WW4A	05/30/18	09/20/18	1.8	22	5.0	6.9	14	0	0
BBC_WW4A	05/30/19	09/24/19	0.2	21	8.0	9.0	0	0	0
BBC_WW4A	05/30/19	09/24/19	1.9	22	6.5	8.3	0	0	0
BBC_WW5	06/03/15	09/23/15	0.2	18	5.8	6.7	6	0	0
BBC_WW5	06/03/15	09/23/15	2.4	18	5.6	6.4	33	0	0
BBC_WW5	06/05/16	09/23/16	0.2	14	4.4	6.3	29	7	0
BBC_WW5	06/05/16	09/23/16	2.1	14	4.4	6.1	50	14	0
BBC_WW5	06/07/17	09/12/17	0.2	17	5.6	7.0	6	0	0
BBC_WW5	06/07/17	09/12/17	3.0	18	5.4	6.6	17	0	0
BBC_WW5	05/31/18	09/18/18	0.2	19	4.6	6.4	32	11	0
BBC_WW5	05/31/18	09/18/18	2.7	19	4.8	6.1	47	16	0
BBC_WW5	06/26/19	09/15/19	0.5	7	6.0	6.7	0	0	0
BBC_WW5	06/26/19	09/15/19	2.2	7	5.5	6.4	14	0	0
BBC_WW6	06/04/15	09/21/15	0.1	17	3.9	6.3	41	18	6
BBC_WW6	07/01/15	08/27/15	0.6	4	4.3	5.1	75	50	0

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_WW6	06/06/16	08/15/16	0.2	5	5.7	6.0	60	0	0
BBC_WW6	08/08/17	08/17/17	0.2	2	4.7	6.4	50	50	0
BBC_WW6	08/08/17	08/08/17	0.6	1	4.6	4.6	100	100	0
BBC_WW6	05/31/18	05/31/18	0.2	1	8.5	8.5	0	0	0
BBC_WW6	06/27/18	06/27/18	0.3	1	5.6	5.6	100	0	0
BBC_WW6	07/02/19	07/08/19	0.2	2	7.3	7.3	0	0	0
BBC_WW6	07/02/19	07/02/19	0.7	1	5.5	5.5	100	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_WW0	05/29/15	09/04/15	0.1	15	14	23.2	21.0	0
BBC_WW0	06/04/15	08/25/15	0.6	4	4	22.8	19.3	0
BBC_WW0	06/21/16	09/07/16	0.2	12	12	25.7	21.2	0
BBC_WW0	08/16/16	09/01/16	0.4	2	2	25.7	24.9	0
BBC_WW0	07/06/17	09/21/17	0.2	10	9	23.9	19.5	0
BBC_WW0	05/30/18	09/19/18	0.2	25	22	24.3	21.4	0
BBC_WW0	06/10/19	09/23/19	0.1	24	22	26.0	20.1	0
BBC_WW0	06/10/19	06/10/19	0.7	1	1	18.9	18.9	0
BBC_WW1N	07/13/15	08/25/15	0.2	4	4	26.4	25.2	0
BBC_WW1N	07/05/16	08/15/16	0.2	3	3	29.1	26.6	0
BBC_WW1N	07/06/17	08/03/17	0.2	3	3	28.4	26.3	0
BBC_WW1N	06/05/18	09/19/18	0.2	17	16	28.7	23.7	0
BBC_WW1N	06/05/18	09/19/18	4.6	13	12	27.4	23.2	0
BBC_WW1N	06/10/19	09/19/19	0.2	8	7	25.7	23.1	0
BBC_WW1N	06/10/19	09/19/19	4.7	8	7	26.1	23.2	0
BBC_WW1X	05/29/15	08/26/15	0.2	14	13	26.9	23.6	0
BBC_WW1X	05/29/15	08/26/15	2.9	14	13	27.2	23.6	0
BBC_WW1X	06/10/16	09/21/16	0.2	8	6	27.6	23.5	0
BBC_WW1X	06/10/16	09/21/16	4.6	7	5	27.7	23.6	0
BBC_WW1X	06/06/17	08/17/17	0.1	2	2	24.5	19.3	0
BBC_WW1X	06/12/17	09/21/17	0.8	16	14	26.5	22.8	0
BBC_WW1X	07/11/19	08/15/19	0.2	4	4	25.4	24.2	0
BBC_WW2	05/29/15	09/21/15	0.2	14	12	27.6	24.1	0
BBC_WW2	05/29/15	09/21/15	1.1	14	12	27.5	24.2	0
BBC_WW2	06/06/16	09/14/16	0.2	14	14	30.0	24.5	1
BBC_WW2	06/06/16	09/14/16	1.3	9	9	30.0	25.1	1
BBC_WW2	06/16/17	09/21/17	0.2	7	6	24.3	21.4	0
BBC_WW2	06/16/17	09/21/17	1.2	7	6	24.8	22.2	0
BBC_WW2	05/30/18	09/20/18	0.2	10	8	26.7	22.0	0
BBC_WW2	05/30/18	09/20/18	1.0	20	18	27.8	23.3	0
BBC_WW2	06/10/19	09/22/19	0.2	12	11	26.2	22.4	0
BBC_WW2	06/10/19	09/14/19	1.2	6	6	25.5	21.7	0
BBC_WW3	08/25/15	08/25/15	0.2	1	1	26.0	26.0	0
BBC_WW3	08/25/15	08/25/15	0.6	1	1	26.0	26.0	0
BBC_WW3	07/10/18	08/21/18	0.2	4	4	28.5	25.9	0

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_WW4	08/25/15	08/25/15	0.2	1	1	25.0	25.0	0
BBC_WW4A	05/28/15	09/23/15	0.2	23	20	28.0	24.2	0
BBC_WW4A	05/28/15	09/23/15	1.8	21	18	28.0	23.9	0
BBC_WW4A	05/31/16	09/24/16	0.2	22	18	29.0	24.5	0
BBC_WW4A	05/31/16	09/24/16	1.8	22	18	28.0	24.6	0
BBC_WW4A	05/31/17	09/16/17	0.2	21	19	25.8	21.7	0
BBC_WW4A	05/31/17	09/16/17	1.8	21	19	25.2	21.6	0
BBC_WW4A	05/30/18	09/20/18	0.2	22	20	25.7	22.7	0
BBC_WW4A	05/30/18	09/20/18	1.8	22	20	25.7	22.8	0
BBC_WW4A	05/30/19	09/24/19	0.2	21	18	26.3	22.5	0
BBC_WW4A	05/30/19	09/24/19	1.9	21	18	25.7	22.4	0
BBC_WW5	06/03/15	09/23/15	0.2	19	17	26.7	23.2	0
BBC_WW5	06/03/15	09/23/15	2.5	18	16	25.7	22.8	0
BBC_WW5	06/05/16	09/23/16	0.2	18	15	26.8	23.3	0
BBC_WW5	06/05/16	09/23/16	2.1	18	15	26.8	22.9	0
BBC_WW5	06/07/17	09/12/17	0.2	20	20	28.1	22.5	0
BBC_WW5	06/07/17	09/12/17	3.0	17	17	24.6	21.4	0
BBC_WW5	05/31/18	09/18/18	0.2	19	16	26.8	23.7	0
BBC_WW5	05/31/18	09/18/18	2.8	19	16	26.4	23.2	0
BBC_WW5	06/26/19	09/15/19	0.5	7	7	26.2	23.1	0
BBC_WW5	06/26/19	09/15/19	2.2	7	7	25.7	22.7	0
BBC_WW6	05/29/15	09/21/15	0.1	19	17	27.2	23.2	0
BBC_WW6	07/01/15	08/27/15	0.6	4	4	26.8	25.0	0
BBC_WW6	06/06/16	08/15/16	0.2	5	5	30.1	24.8	1
BBC_WW6	07/06/17	08/17/17	0.2	5	5	29.3	25.4	0
BBC_WW6	08/08/17	08/08/17	0.6	1	1	23.0	23.0	0
BBC_WW6	05/31/18	08/21/18	0.1	5	4	28.2	25.8	0
BBC_WW6	06/27/18	06/27/18	0.3	1	1	22.5	22.5	0
BBC_WW6	07/02/19	08/15/19	0.2	6	6	25.0	23.7	0
BBC_WW6	07/02/19	07/02/19	0.7	1	1	23.7	23.7	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

MassDEP Nutrient Enrichment Indicator Data (2011-2018). (MassDEP Undated11) (MassDEP Undated6)

[Summer seasonal total phosphorus data collected May-Sept]

Station Code	Data Year	Seasonal TP Count	Seasonal TP Min (mg/L)	Seasonal TP Max (mg/L)	Seasonal TP Avg (mg/L)	Delta DO Max (mg/L)	Delta DO Avg (mg/L)	DO Sat Max (%)	pH Max (SU)	Count Algal Obsv.	Dense/V. Dense Film/Fila. Algae
W2501	2014	--	--	--	--	--	--	--	--	2	0
W2502	2014	--	--	--	--	--	--	--	--	2	0
W2503	2014	--	--	--	--	--	--	--	--	1	0
W2504	2014	--	--	--	--	--	--	--	--	2	0

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_WW0	2015	0.2	4	0.48	0.73	0.59	4	1.51	3.17	2.27	4	0
BBC_WW0	2016	0.2	4	0.62	1.33	0.87	4	1.36	15.08	5.49	3	1
BBC_WW0	2017	0.2	4	0.71	0.93	0.81	4	1.74	4.54	3.26	4	0
BBC_WW0	2018	0.2	4	0.61	0.80	0.74	4	0.90	1.71	1.18	4	0
BBC_WW0	2019	0.2	4	0.63	0.87	0.77	3	0.10	1.75	0.79	3	0
BBC_WW1N	2015	0.2	3	0.51	0.59	0.55	4	4.88	27.30	17.32	1	3
BBC_WW1N	2016	0.2	1	0.46	0.46	0.46	3	5.60	11.43	8.11	0	1
BBC_WW1N	2017	0.2	3	0.63	3.88	1.77	3	10.88	360.98	128.47	0	3
BBC_WW1N	2018	0.2	1	1.03	1.03	1.03	3	14.58	42.54	26.53	0	3
BBC_WW1X	2017	0.2	1	0.57	0.57	0.57	1	9.20	9.20	9.20	0	0
BBC_WW1X	2019	0.2	3	0.51	0.92	0.75	4	2.52	11.47	8.34	1	2
BBC_WW3	2015	0.2	1	0.66	0.66	0.66	1	9.11	9.11	9.11	0	0
BBC_WW3	2015	0.6	1	0.54	0.54	0.54	1	19.35	19.35	19.35	0	1
BBC_WW3	2018	0.2	1	3.75	3.75	3.75	3	33.81	79.03	49.31	0	3
BBC_WW4	2015	0.2	1	0.53	0.53	0.53	1	4.98	4.98	4.98	1	0
BBC_WW5	2015	0.2	1	0.38	0.38	0.38	1	7.68	7.68	7.68	0	0
BBC_WW5	2017	0.2	3	0.53	0.59	0.55	3	7.03	10.95	8.54	0	1
BBC_WW6	2015	0.2	3	0.60	0.82	0.70	4	19.07	88.83	40.69	0	4
BBC_WW6	2016	0.2	1	0.61	0.61	0.61	3	14.45	19.64	17.41	0	3
BBC_WW6	2017	0.2	4	0.96	1.09	1.03	4	18.14	29.55	24.43	0	4
BBC_WW6	2018	0.1	2	0.96	0.97	0.97	3	5.71	45.16	27.43	0	2
BBC_WW6	2019	0.2	3	0.79	1.36	1.03	3	3.43	36.40	21.36	1	2

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_WW0	06/04/15	06/04/15	1	0.9	0.9	0.9
BBC_WW0	06/10/19	08/07/19	9	0.3	0.9	0.5
BBC_WW1N	08/25/15	08/25/15	1	1.1	1.1	1.1
BBC_WW1N	07/20/17	08/03/17	2	0.5	0.9	0.7
BBC_WW1N	06/05/18	09/19/18	13	0.7	2.3	1.3
BBC_WW1N	06/10/19	09/19/19	8	0.5	1.6	1.1
BBC_WW1X	05/29/15	08/18/15	13	0.9	2.8	1.4
BBC_WW1X	06/10/16	09/21/16	7	1.1	1.9	1.4
BBC_WW1X	06/12/17	09/21/17	10	0.3	1.2	0.7
BBC_WW1X	07/25/19	07/25/19	1	0.3	0.3	0.3
BBC_WW2	05/29/15	09/21/15	13	0.8	1.3	1.0
BBC_WW2	06/06/16	09/14/16	10	1.0	1.8	1.3
BBC_WW2	06/16/17	09/21/17	4	0.5	1.8	1.0
BBC_WW2	05/30/18	09/20/18	14	0.6	1.3	1.0
BBC_WW2	07/02/19	09/22/19	11	0.3	1.2	0.7
BBC_WW3	08/07/18	08/21/18	2	0.4	0.7	0.5
BBC_WW4	08/25/15	08/25/15	1	1.2	1.2	1.2

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_WW4A	05/28/15	09/19/15	21	0.6	1.9	1.2
BBC_WW4A	05/31/16	09/21/16	21	1.1	1.9	1.4
BBC_WW4A	05/31/17	09/05/17	19	0.9	1.9	1.3
BBC_WW4A	05/30/18	09/20/18	22	0.9	1.8	1.3
BBC_WW4A	05/30/19	09/24/19	21	0.6	1.8	1.2
BBC_WW5	06/03/15	09/23/15	15	1.3	2.7	2.0
BBC_WW5	06/05/16	09/19/16	16	1.5	2.8	2.0
BBC_WW5	06/07/17	09/01/17	19	1.0	2.8	1.8
BBC_WW5	05/31/18	09/16/18	18	1.3	2.5	1.7
BBC_WW5	06/26/19	09/15/19	6	1.1	2.4	1.6
BBC_WW6	07/16/15	08/25/15	3	0.3	0.8	0.6
BBC_WW6	08/07/18	08/21/18	2	0.4	0.6	0.5
BBC_WW6	07/25/19	07/25/19	1	0.3	0.3	0.3

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_WW0	07/13/15	08/25/15	0.2	4	0.023	0.037	0.031
BBC_WW0	07/05/16	08/15/16	0.2	4	0.022	0.131	0.057
BBC_WW0	07/06/17	08/17/17	0.2	4	0.013	0.053	0.028
BBC_WW0	07/10/18	08/21/18	0.2	4	0.015	0.037	0.026
BBC_WW0	07/11/19	08/15/19	0.2	4	0.023	0.051	0.037
BBC_WW1N	07/13/15	08/25/15	0.2	4	0.009	0.019	0.014
BBC_WW1N	07/05/16	08/15/16	0.2	3	0.005	0.019	0.013
BBC_WW1N	07/06/17	08/03/17	0.2	3	0.014	0.032	0.021
BBC_WW1N	07/10/18	08/21/18	0.2	4	0.004	0.020	0.008
BBC_WW1X	08/17/17	08/17/17	0.2	1	0.028	0.028	0.028
BBC_WW1X	07/11/19	08/15/19	0.2	4	0.007	0.109	0.040
BBC_WW3	08/25/15	08/25/15	0.2	1	0.019	0.019	0.019
BBC_WW3	08/25/15	08/25/15	0.6	1	0.044	0.044	0.044
BBC_WW3	07/10/18	08/21/18	0.2	4	0.004	0.008	0.005
BBC_WW4	08/25/15	08/25/15	0.2	1	0.053	0.053	0.053
BBC_WW5	08/25/15	08/25/15	0.2	1	0.026	0.026	0.026
BBC_WW5	07/06/17	08/03/17	0.2	3	0.005	0.007	0.006
BBC_WW6	07/13/15	08/25/15	0.2	4	0.009	0.017	0.014
BBC_WW6	07/05/16	08/15/16	0.2	3	0.004	0.007	0.005
BBC_WW6	07/06/17	08/17/17	0.2	4	0.005	0.015	0.008
BBC_WW6	07/10/18	08/21/18	0.1	4	0.004	0.010	0.006
BBC_WW6	07/11/19	08/15/19	0.2	4	0.004	0.118	0.033

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	

No fish toxics monitoring has been conducted in this Weweantic River AU (MA95-05); therefore the Fish Consumption Use is Not Assessed.

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
Weweantic River (MA95-05): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.5843 sq mi (95%). The approved shellfish growing area represents 0 sq mi (0%). The Shellfish Harvesting Use is assessed as Not Supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications and the prior classifications, the existing fecal coliform impairment is being retained.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB35.0	Weweantic River	Conditionally Approved	0.17309	28.0%
BB35.2	North End of Weweantic River	Prohibited	0.18402	29.8%
BB35.5	Middle River	Conditionally Approved	0.22717	36.8%

Aesthetic

2022 Use Attainment	Alert
Insufficient Information	YES
2022 Use Attainment Summary	
<p>MassDEP staff recorded aesthetics observations at four sites in Wareham along this Weweantic River AU (MA95-05), from up to downstream as follows: the eastern bank just upstream of Rt.6 (W2503), Briarwood Beach at Wilson St. (W2504), Briarwood Beach at McKinley St. (W2501), and Briarwood Beach at Munroe Parkway (W2502) all in the summer of 2014 (n=8 site visits). There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) at any of the sites.</p> <p>Since all observations were on the same two dates in summer 2014 and all of the sites were on the east bank in the vicinity of Briarwood Beach (poor representativeness), too limited data are available to assess the Aesthetics Use for this Weweantic River AU (MA95-05), so it is assessed as having Insufficient Information. The Alert Status previously identified (MassDEP 2003) due to poor water clarity and the presence of sea lettuce (a macroalgae capable of creating nuisance conditions), is being carried forward. A recommendation will be made for monitoring staff to watch out for these issues and ensure that documentation of any observations takes place.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2501	MassDEP	Water Quality	Weweantic River	[Briarwood beach at McKinley Street, Wareham]	41.736708	-70.741795
W2502	MassDEP	Water Quality	Weweantic River	[Briarwood beach at Munroe Parkway and Washington Drive, Wareham]	41.735591	-70.741194
W2503	MassDEP	Water Quality	Weweantic River	[the eastern bank, just upstream at Route 6, Wareham]	41.738823	-70.746085
W2504	MassDEP	Water Quality	Weweantic River	[Briarwood beach at Wilson Street, Wareham]	41.738109	-70.743413

*Aesthetic Observations***Aesthetics Summary Statements for MassDEP Stations (2011-2018) (MassDEP Undated6)**

Station Code	Waterbody	Data Year	Field Sheet Count	Aesthetics Summary Statement
W2501	Weweantic River	2014	2	MassDEP aesthetics observations for station W2501 on Weweantic River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2014. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2).
W2502	Weweantic River	2014	2	MassDEP aesthetics observations for station W2502 on Weweantic River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2014. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2).
W2503	Weweantic River	2014	2	MassDEP aesthetics observations for station W2503 on Weweantic River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2014. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2).
W2504	Weweantic River	2014	2	MassDEP aesthetics observations for station W2504 on Weweantic River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2014. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2).

Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018) (MassDEP Undated11) (MassDEP Undated6)

Station Code	Data Year	Field Sheet Count	Field Sheet Count w/ Film & Filamentous Algae Observations	Dense/ Very Dense Film/ Filamentous Algae
W2501	2014	2	2	0
W2502	2014	2	2	0
W2503	2014	2	1	0
W2504	2014	2	2	0

MassDEP Aesthetics Observations (2011-2018) (MassDEP Undated11)

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W2501	Weweantic River	2014	Color	None	2	2
W2501	Weweantic River	2014	Objectionable Deposits	Not Applicable (N/A)	2	2
W2501	Weweantic River	2014	Odor	None	2	2
W2501	Weweantic River	2014	Scum	Not Applicable (N/A)	2	2
W2501	Weweantic River	2014	Turbidity	Slightly Turbid	2	2

Station Code	Waterbody	Data Year	Parameter	Result	Result Count	Total Field Sheet Count
W2502	Weweantic River	2014	Color	None	2	2
W2502	Weweantic River	2014	Objectionable Deposits	Not Applicable (N/A)	2	2
W2502	Weweantic River	2014	Odor	None	2	2
W2502	Weweantic River	2014	Scum	Not Applicable (N/A)	2	2
W2502	Weweantic River	2014	Turbidity	Slightly Turbid	2	2
W2503	Weweantic River	2014	Color	None	2	2
W2503	Weweantic River	2014	Objectionable Deposits	Not Applicable (N/A)	2	2
W2503	Weweantic River	2014	Odor	None	2	2
W2503	Weweantic River	2014	Scum	Not Applicable (N/A)	2	2
W2503	Weweantic River	2014	Turbidity	Slightly Turbid	2	2
W2504	Weweantic River	2014	Color	None	2	2
W2504	Weweantic River	2014	Objectionable Deposits	Not Applicable (N/A)	2	2
W2504	Weweantic River	2014	Odor	None	2	2
W2504	Weweantic River	2014	Scum	Not Applicable (N/A)	2	2
W2504	Weweantic River	2014	Turbidity	Slightly Turbid	2	2

Primary Contact Recreation

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>MassDEP staff collected <i>Enterococci</i> bacteria samples from this Weweantic River AU, in Wareham (MA95-05) for the purpose of bacteria source tracking (BST), at the following sampling stations (data years): on the eastern bank, just upstream at Rt. 6 (W2503) between July and August 2014 (n=2), off Briarwood Beach at Wilson St. (W2504) between July and September 2014 (n=3), off Briarwood Beach at McKinley St. (W2501) between July and September 2014 (n=2), and farthest downstream off Briarwood Beach at Munroe Parkway/Washington Drive (W2502) between July and August 2014 (n=2). Analysis of these single-year low frequency datasets indicated that 100% of intervals at three of the stations (i.e., W2503, W2504, and W2502) had GM's >35 cfu/100 ml. In addition, one sample at stations W2504 and W2502 exceeded the 130 cfu/100 ml STV and the seasonal GM's were 102, 38, 12, and 73 cfu/100 ml from upstream to downstream, respectively. Human marker analysis was also run at two of the beach stations in 2014 to rule out the presence of human sources; results were "Inconclusive" at McKinley St. and "Weak" at Wilson St. At both locations, the <i>Enterococcus</i> concentration was so low that there was not enough DNA present to be able to test for the esp. gene. There were some bacteroidetes markers present at both stations, however the lab (State Lab Wall Experiment Station) suggested that it is possible to get false-positive results for bacteroidetes markers from seagull populations. It was concluded that the results were not compelling enough to support the probability of "human related bacteria sources" in the Briarwood Beach area. A population of pigeons was also noted to be roosting under the Rt.6 bridge and was suspected to be a potential source of bacteria to the beach area. There are two beaches in this Weweantic River AU; the names and ID codes for the beaches from up to downstream are as follows: Briarwood, in Wareham (ID 5247) and Dexter Lane, in Marion (ID 2943). The Dexter Lane beach was never posted for swimming between 2014 and 2019, however the Briarwood beach was frequently posted during this time frame, with 13, 26, and 30% of the bathing seasons posted in 2014, 2015, and 2019 respectively.</p> <p>The Primary Contact Recreational Use for this Weweantic River AU (MA95-05) will continue to be assessed as Not Supporting with the <i>Enterococcus</i> impairment carried forward based on the elevated <i>Enterococcus</i> concentrations documented by MassDEP staff in the Briarwood beach area in 2014, as well as the frequent swimming advisory postings at the Briarwood beach between 2014 and 2019.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2501	MassDEP	Water Quality	Weweantic River	[Briarwood beach at McKinley Street, Wareham]	41.736708	-70.741795
W2502	MassDEP	Water Quality	Weweantic River	[Briarwood beach at Munroe Parkway and Washington Drive, Wareham]	41.735591	-70.741194
W2503	MassDEP	Water Quality	Weweantic River	[the eastern bank, just upstream at Route 6, Wareham]	41.738823	-70.746085
W2504	MassDEP	Water Quality	Weweantic River	[Briarwood beach at Wilson Street, Wareham]	41.738109	-70.743413

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (30-day Interval Analysis) (MassDEP Undated11) (MassDEP Undated6)

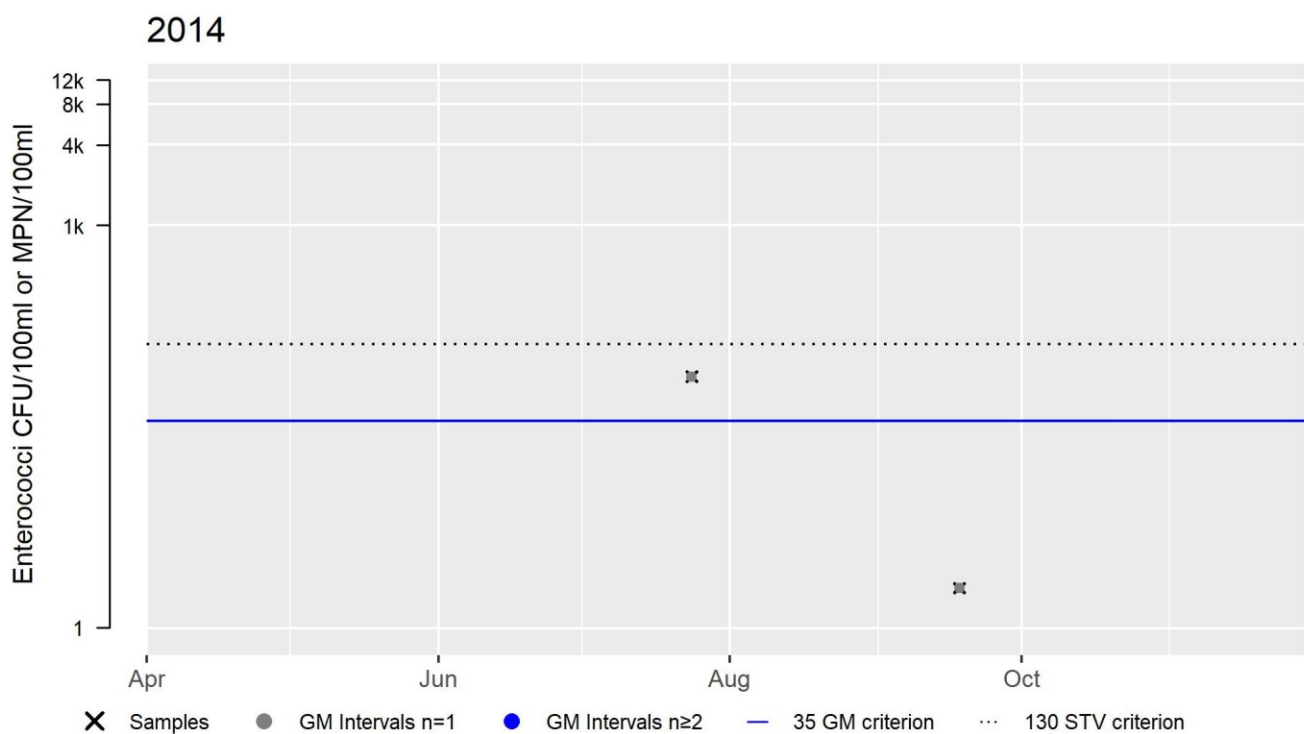
[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result	Maximum Sample Result	Seasonal Geometric Mean
W2501	MassDEP	Enterococci	07/24/14	09/18/14	2	2	75	12
W2502	MassDEP	Enterococci	07/24/14	08/06/14	2	31	171	73
W2503	MassDEP	Enterococci	07/24/14	08/06/14	2	86	122	102
W2504	MassDEP	Enterococci	07/24/14	09/18/14	3	2	275	38

W2501 Enterococci (30-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	12
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

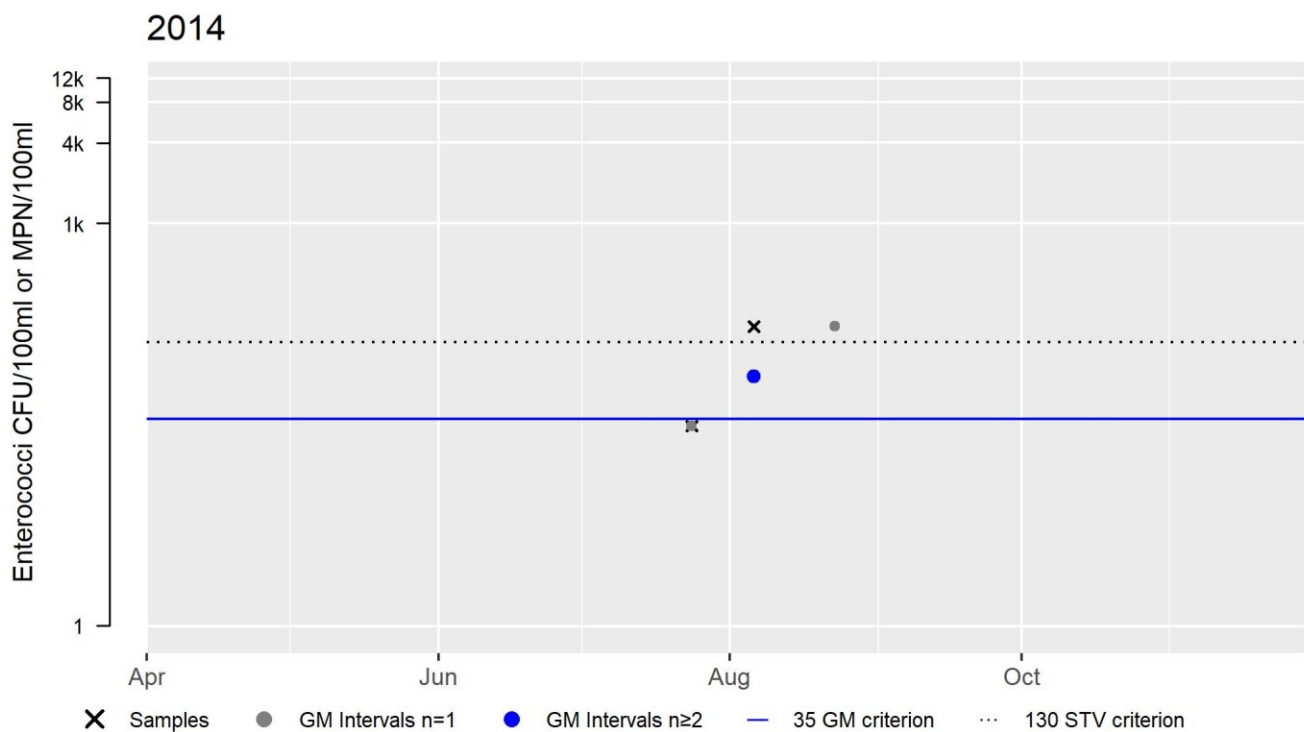
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2502 Enterococci (30-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	73
#GMI	1
#GMI Ex	1
%GMI Ex	100
n>STV	1
%n>STV	50

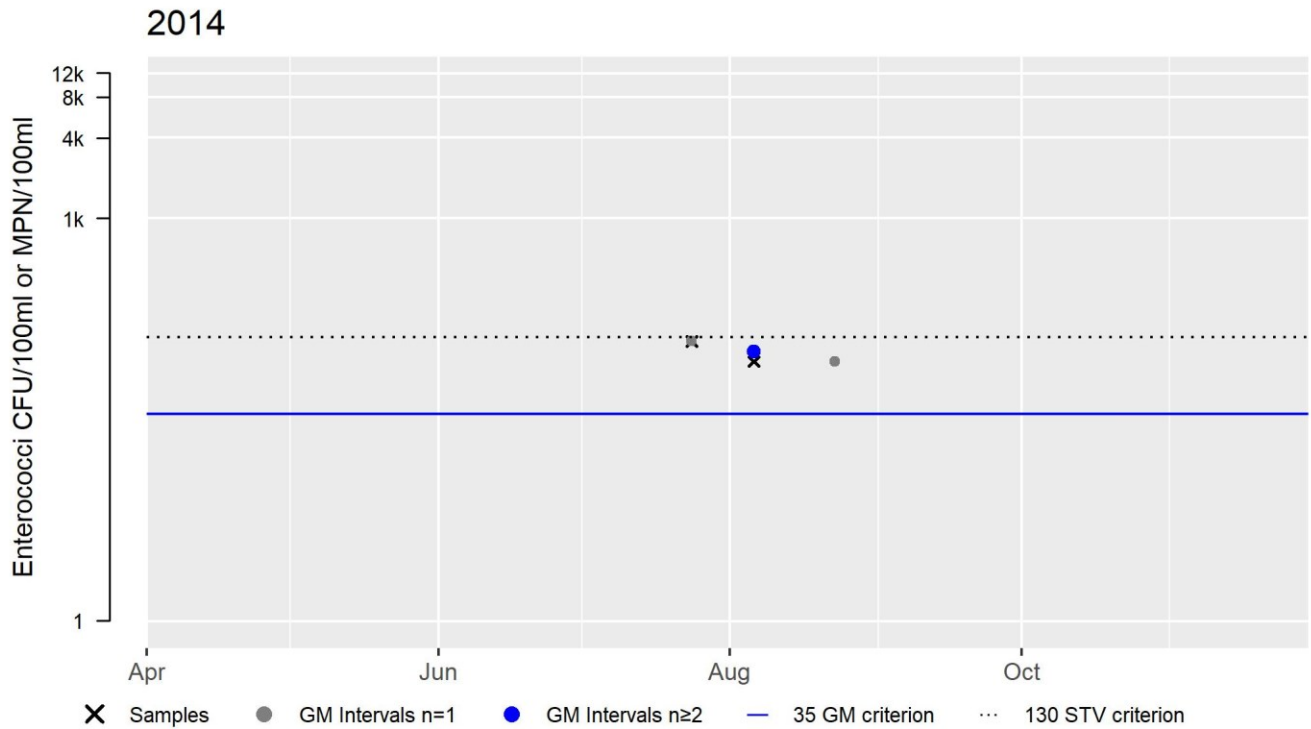
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2503 Enterococci (30-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	102
#GMI	1
#GMI Ex	1
%GMI Ex	100
n>STV	0
%n>STV	0

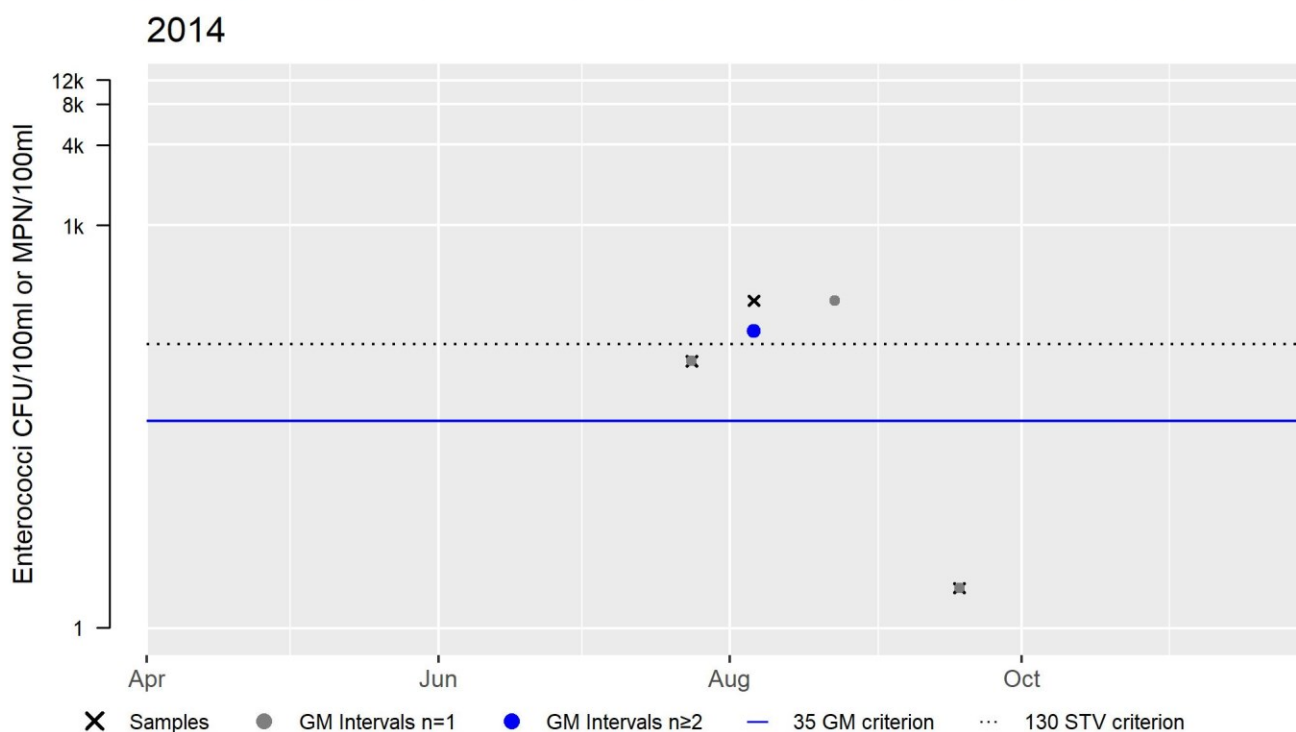
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2504 Enterococci (30-day Interval), Primary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	38
#GMI	1
#GMI Ex	1
%GMI Ex	100
n>STV	1
%n>STV	33

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019 (MassDEP Undated2)

Summary

BST work was conducted in 2014 and 2015 in the Briarwood Beach area (around the Rt.6 bridge) of the Weweantic River AU (MA95-05). This area became a focus for BST as a result of complaints from the Briarwood Beach Homeowners Association and the Town of Wareham, regarding regular beach closures due to elevated bacteria. Most of the BST samples sites were located along the Briarwood Beach shoreline, though a number were also sampled on the western shore of the river, in the marsh area (via canoe). E.coli concentrations ranged from 74 to 399MPN and Enterococcus concentrations ranged from 20 to 836MPN. Human marker analysis was run at 2 beach sites to rule out the presence of human sources; results were “Inconclusive” at McKinley Street and “Weak” at Wilson Street. At both locations, the enterococci concentration was so low that there was not enough DNA present to be able to test for the esp. gene. Also for both there were some bacteroidetes markers present; however the WES lab suggested that it is possible to get false positive results for bacteroidetes markers from seagull populations. It was concluded that the results were not compelling enough to support the probability of “human related bacteria sources” in the Briarwood Beach area. A population of pigeons was also noted to be roosting under the Rt.6 bridge and was suspected to be a potential source of bacteria to the beach area.

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2943	Dexter Lane/Marion	41.72489	-70.73210	41.72487	-70.73200	0%	0%	0%	0%	0%	0%	0
5247	Briarwood/Wareham	41.73390	-70.74210	41.73868	-70.74490	13%	26%	0%	0%	0%	30%	3

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Weweantic River (MA95-05): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.5843 sq mi (95%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Insufficient Information	NO
2022 Use Attainment Summary	
<p>MassDEP staff collected <i>Enterococcus</i> bacteria samples at this Weweantic River AU in Wareham (MA95-05) for the purpose of bacteria source tracking (BST), at the following sampling stations (data years): on the eastern bank, just upstream at Rt. 6 (W2503) between July and August 2014 (n=2), off Briarwood beach at Wilson St. (W2504) between July and September 2014 (n=3), off Briarwood Beach at McKinley St. (W2501) between July and September 2014 (n=2), and farthest downstream off Briarwood Beach at Munroe Parkway/Washington Drive (W2502) between July and August 2014 (n=2). Analysis of these single-year low frequency datasets indicated that there were only “enough” samples available (according to the CALM “Use Attainment Impairment Decision Schema” i.e., 3 samples within a 90-day interval) at station W2504 and in that case the GM for the interval was <175 cfu/100ml. No samples exceeded the 350 cfu/100 ml STV. Human marker analysis was also run at two of the beach stations in 2014 to rule out the presence of human sources; results were “Inconclusive” at McKinley St. and “Weak” at Wilson St. At both locations, the <i>Enterococcus</i> concentration was so low that there was not enough DNA present to be able to test for the esp. gene. There were some bacteroidetes markers present at both stations, however the lab (State Lab Wall Experiment Station) suggested that it is possible to get false-positive results for bacteroidetes markers from seagull populations. It was concluded that the results were not compelling enough to support the probability of “human related bacteria sources” in the Briarwood Beach area. A population of pigeons was also noted to be roosting under the Rt.6 bridge and was suspected to be a potential source of bacteria to the beach area.</p> <p>Too limited <i>Enterococcus</i> bacteria data are available to assess the Secondary Contact Recreational Use for this Weweantic River AU (MA95-05) so it is assessed as having Insufficient Information.</p>	

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
W2501	MassDEP	Water Quality	Weweantic River	[Briarwood beach at McKinley Street, Wareham]	41.736708	-70.741795
W2502	MassDEP	Water Quality	Weweantic River	[Briarwood beach at Munroe Parkway and Washington Drive, Wareham]	41.735591	-70.741194
W2503	MassDEP	Water Quality	Weweantic River	[the eastern bank, just upstream at Route 6, Wareham]	41.738823	-70.746085
W2504	MassDEP	Water Quality	Weweantic River	[Briarwood beach at Wilson Street, Wareham]	41.738109	-70.743413

Bacteria Data

Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis) (MassDEP Undated11) (MassDEP Undated6)

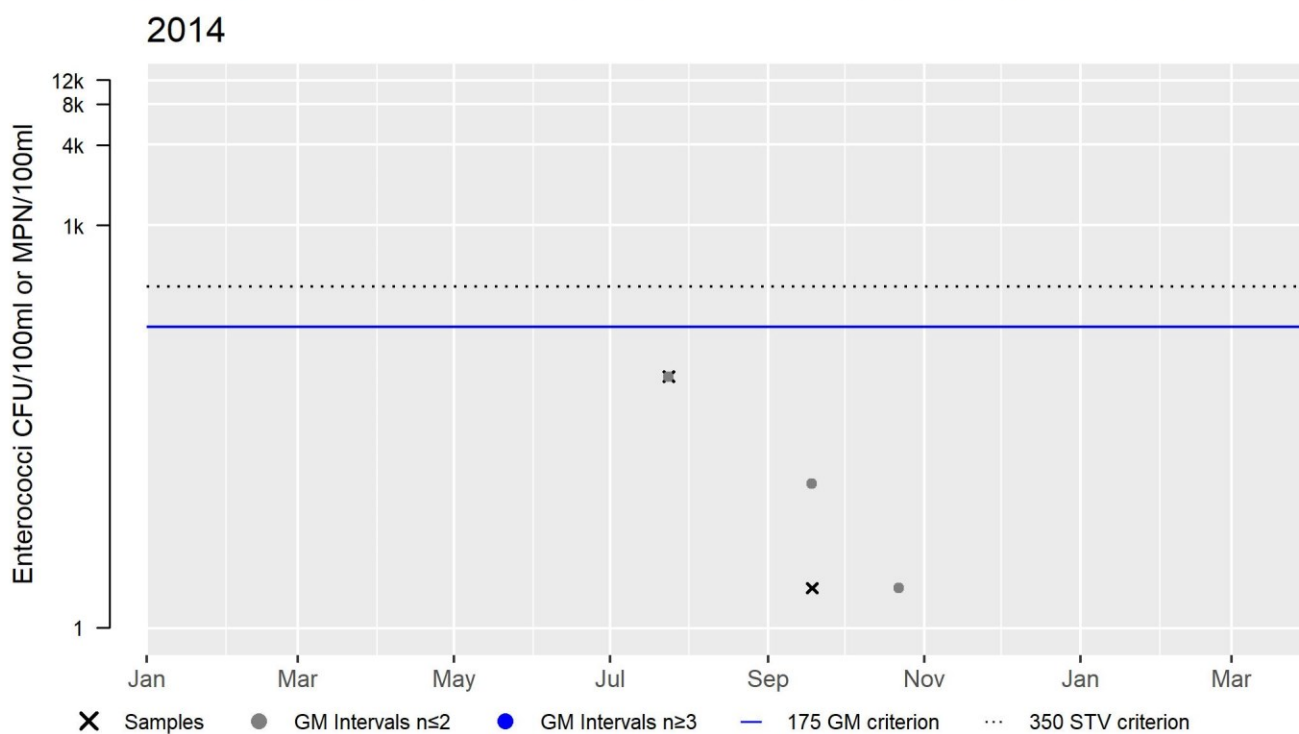
[Result units are CFU/100ml or MPN/100ml]

Station Code	Organization	Indicator	Start Date	End Date	Sample Count	Minimum Sample Result (CFU/100ml or MPN/100ml)	Maximum Sample Result (CFU/100ml or MPN/100ml)	Seasonal Geometric Mean (CFU/100ml or MPN/100ml)
W2501	MassDEP	Enterococci	07/24/14	09/18/14	2	2	75	12
W2502	MassDEP	Enterococci	07/24/14	08/06/14	2	31	171	73
W2503	MassDEP	Enterococci	07/24/14	08/06/14	2	86	122	102
W2504	MassDEP	Enterococci	07/24/14	09/18/14	3	2	275	38

W2501 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	12
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

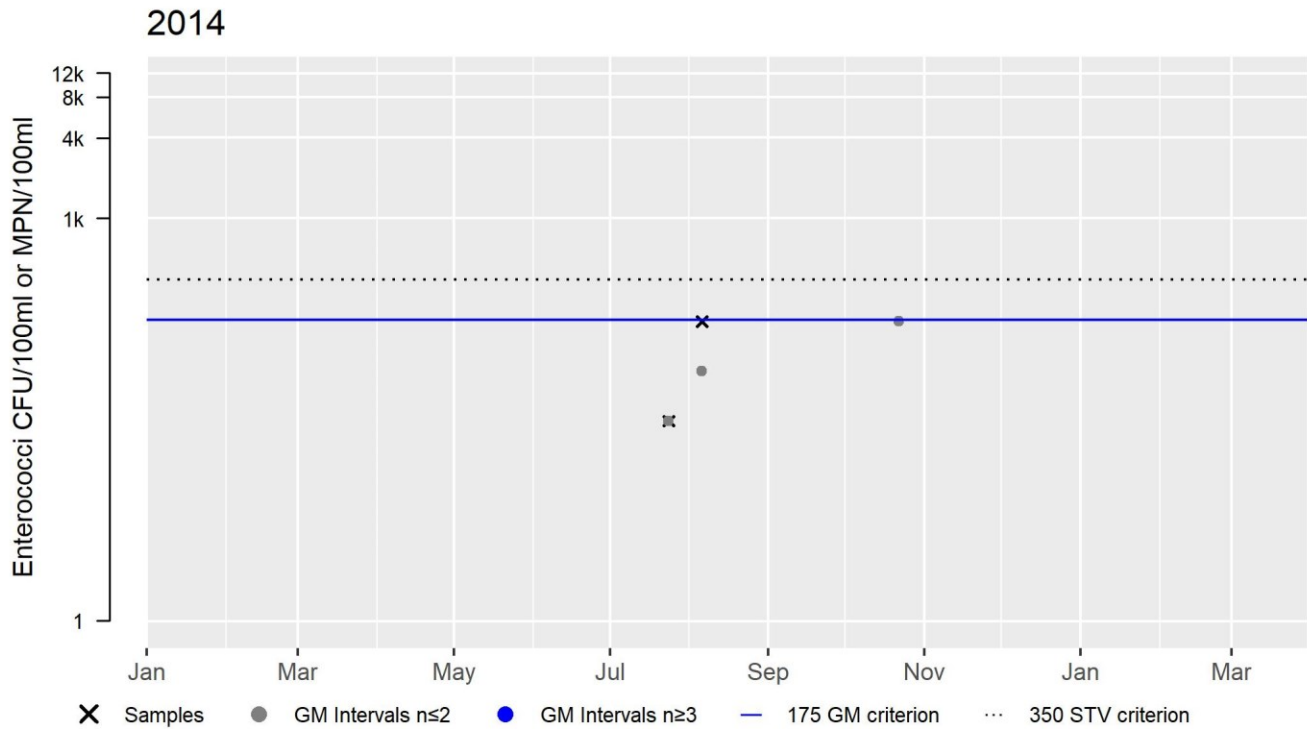
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2502 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	73
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

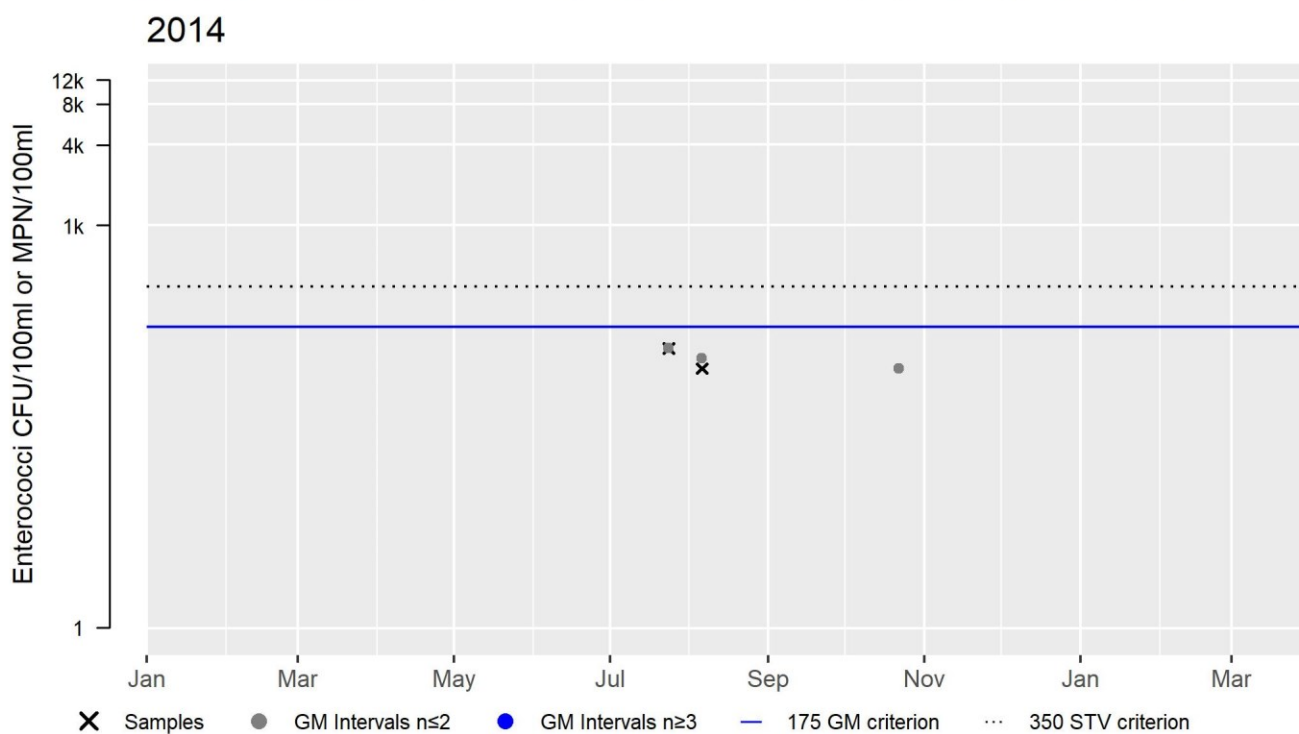
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2503 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	2
SeasGM	102
#GMI	0
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

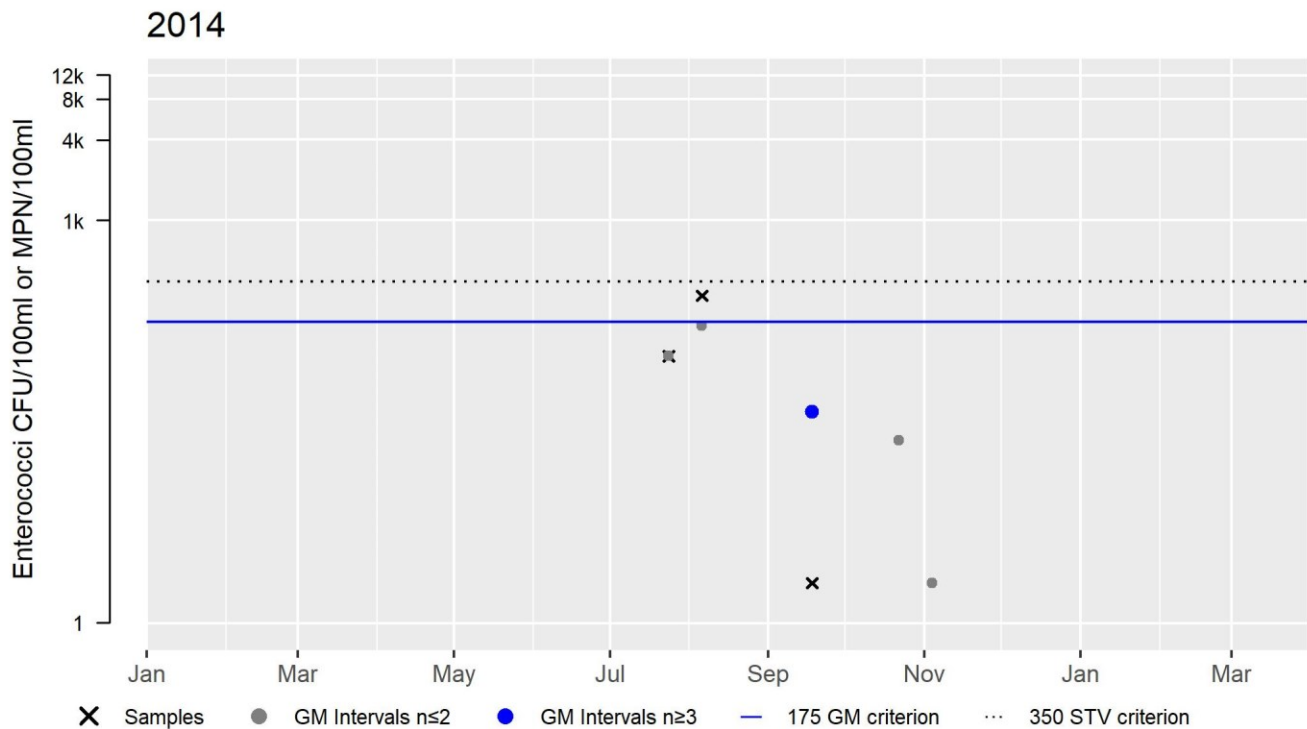
Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



W2504 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

Var	Res
Samples	3
SeasGM	38
#GMI	1
#GMI Ex	0
%GMI Ex	0
n>STV	0
%n>STV	0

Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exceedances; %GMI Ex = percent GMI Exceedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV



Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary

Weweantic River (MA95-05): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.5843 sq mi (95%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than "approved", the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

White Island Pond, East Basin (MA95166)

Location:	(East Basin) Plymouth/Wareham.
AU Type:	FRESHWATER LAKE
AU Size:	165 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Curly-leaf Pondweed*)		Added
4c	4c	(Eurasian Water Milfoil, <i>Myriophyllum Spicatum</i> *)		Added
4c	4c	(Fanwort*)		Added
4c	4c	(Non-Native Aquatic Plants*)		Removed
4c	4c	(Swollen Bladderwort*)		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Curly-leaf Pondweed*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
(Eurasian Water Milfoil, <i>Myriophyllum Spicatum</i> *)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
(Fanwort*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
(Swollen Bladderwort*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Non-Native Aquatic Plants	Clarification of listing cause	The generic Non-Native Aquatic Plants impairment code is being removed since the species-specific Fanwort, Eurasian water milfoil, Curly-leaf pondweed, and Swollen bladderwort impairments are being added.

Recommendations

2022 Recommendations
ALU: Conduct an aquatic macrophyte survey of White Island Pond (East Basin) when flowering heads are present to determine if <i>Myriophyllum heterophyllum</i> or any non-native species of <i>Najas</i> are infesting the pond (confirmation of any non-native species should be made by a qualified state agency/taxonomist).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
<p>As was previously reported, MassDEP staff conducting an aquatic macrophyte survey in the East Basin of White Island Pond in August 2000 observed an infestation of the non-native, fanwort (<i>Cabomba caroliniana</i>). In subsequent field surveys (2007, 2013, 2017), DEP staff first reported infestations of the non-natives, Eurasian water milfoil (<i>Myriophyllum spicatum</i>), curly-leaf pondweed (<i>Potamogeton crispus</i>), and swollen bladderwort (<i>Utricularia inflata</i>). MassDEP staff also noted the presence of <i>Myriophyllum</i> sp. (2008, 2014) and <i>Najas</i> sp. (2013, 2014); an aquatic macrophyte survey should be conducted to determine whether any additional non-native species are infesting the pond. Dissolved aluminum and total recoverable aluminum data were collected at two sites in White Island Pond (deep hole in the southern lobe-W0762 and north center of north bay-W1602) before and after the 4/2/2013 alum treatment (intended to bind to phosphorus in the water column, resulting in lower water column total phosphorus concentrations). Insufficient input data (DOC, total hardness, pH) were available to use the Aluminum Criteria Calculator to calculate criteria for total recoverable aluminum, so all data (both dissolved and total recoverable) were compared to the watershed-based, default aluminum criteria for total recoverable aluminum. Total recoverable aluminum concentrations were slightly elevated above the default CCC three days after the alum treatment (TU range = 1.2-1.9 at surface; TU range = 1.3-2.0 near bottom), but this is not unexpected, given that the system did not have sufficient time to restabilize. Because the dissolved concentrations were not above the total recoverable default criteria and the dissolved fraction is a component of the total recoverable concentration, no conclusions can be drawn from the dissolved aluminum data. MassDEP staff reported that “no adverse biological impacts were noted during visual surveys for stressed fish and mussels” (Mattson 2015). No impairment decision will be made at this time.</p> <p>The Aquatic Life Use for White Island Pond, East Basin (MA95166) will continue to be assessed as Not Supporting; the generic Non-Native Aquatic Plants impairment is being removed since the other non-native aquatic macrophyte species impairments are being added (Fanwort, Eurasian water milfoil, Curly-leaf pondweed, and Swollen bladderwort). An Alert is being identified due to the possibility of infestations of non-native species of <i>Myriophyllum</i> and <i>Najas</i> in the East Basin of White Island Pond.</p>	

Biological Monitoring Information

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (Mattson 2003) (MassDEP Undated1)

Summary Statement	Assessment Recommendation
As was previously reported, MassDEP staff conducting an aquatic macrophyte survey in the East Basin of White Island Pond in August 2000 observed an infestation of the non-native, fanwort (<i>Cabomba caroliniana</i>). In subsequent field surveys (2007, 2013, 2017), DEP staff first reported infestations of the non-natives, Eurasian water milfoil (<i>Myriophyllum spicatum</i>), curly-leaf pondweed (<i>Potamogeton crispus</i>), and swollen bladderwort (<i>Utricularia inflata</i>). They also noted the presence of <i>Myriophyllum</i> sp. (2008, 2014) and <i>Najas</i> sp. (2013, 2014)- an aquatic macrophyte survey should be conducted to determine whether any additional non-native species are infesting the pond and an Alert should be issued.	Conduct an aquatic macrophyte survey of White Island Pond (East Basin) when flowering heads are present to determine if <i>Myriophyllum heterophyllum</i> or any non-native species of <i>Najas</i> are infesting the pond.

Physico-chemical Water Quality Information

Toxics and other pollutants (metals, ammonia, chloride, chlorine)

White Island Pond (Buzzards Bay, MA95166) Aluminum Data

White Island Pond aluminum data, criteria, and exceedances (in red) pre- and post-alum-treatment* (MassDEP Undated, MassDEP Undated):

AU ID	Unique ID	Date	Time	Surface (S) or Near Bottom (NB)	Diss. Al mg/L	TRA mg/L	Default CMC mg/L	Default CCC mg/L	Diss. Al dCMC TU	Diss. Al dCCC TU	TRA dCMC TU	TRA dCCC TU	Criteria Exceeded
MA95166	W0762 ¹	3/18/2013	12:00 PM	S	0.0033	0.019	0.451	0.230	0.0	0.0	0.0	0.1	
MA95166	W0762 ¹	3/18/2013	12:30 PM	NB	0.0044	0.018	0.451	0.230	0.0	0.0	0.0	0.1	
MA95166	W0762 ¹	4/5/2013	12:05 PM	S	0.100	0.280	0.451	0.230	0.2	0.4	0.6	1.2	TRA dCCC TU
MA95166	W0762 ¹	4/5/2013	12:37 PM	NB	0.049	0.300	0.451	0.230	0.1	0.2	0.7	1.3	TRA dCCC TU
MA95166	W1602 ²	3/18/2013	2:15 PM	S	0.0073	0.022	0.451	0.230	0.0	0.0	0.0	0.1	
MA95166	W1602 ²	3/18/2013	2:20 PM	NB	0.0063	0.020	0.451	0.230	0.0	0.0	0.0	0.1	
MA95166	W1602 ²	4/5/2013	11:00 AM	S	0.053	0.440	0.451	0.230	0.1	0.2	1.0	1.9	TRA dCCC TU
MA95166	W1602 ²	4/5/2013	11:10 AM	NB	0.180	0.470	0.451	0.230	0.4	0.8	1.0	2.0	TRA dCMC TU TRA dCCC TU

* Diss. Al = dissolved aluminum, TRA = total recoverable aluminum, dCMC = default CMC (acute criterion), dCCC = default CCC (chronic criterion)

¹ W0762, deep hole in southern lobe of East Basin, Plymouth

² W1602, north center of north bay of East Basin, Plymouth

Dissolved aluminum and total recoverable aluminum data were collected at two sites in White Island Pond before and after the 4/2/2013 alum treatment (intended to bind to phosphorus in the water column, resulting in lower water column total phosphorus concentrations). Insufficient input data (DOC, total hardness, pH) were available to use the Aluminum Criteria Calculator to calculate criteria for total recoverable aluminum, so all data (both dissolved and total recoverable) were compared to the watershed-based, default aluminum criteria for total recoverable aluminum. Total recoverable aluminum concentrations were slightly elevated above the default CCC 3 days after the alum treatment (TU range = 1.2-1.9 at surface; TU range = 1.3-2.0 near bottom), but this is not unexpected, given that the system did not have sufficient time to restabilize. Because the dissolved concentrations were not above the total recoverable default criteria and the dissolved fraction is a component of the total recoverable concentration, no conclusions can be drawn from the dissolved data. MassDEP staff reported that “no adverse biological impacts were noted during visual surveys for stressed fish and mussels” (Mattson 2015). No impairment decision will be made at this time.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
Although fish toxics sampling was conducted in White Island Pond (East Basin) in 2000, no site-specific fish consumption advisory was issued by DPH.	
The Fish Consumption Use for White Island Pond, East Basin (MA95166) is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for White Island Pond, East Basin (MA95166) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment		Alert
Not Assessed		NO
2022 Use Attainment Summary		
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for White Island Pond, East Basin (MA95166) so it is Not Assessed.		

Secondary Contact Recreation

2022 Use Attainment		Alert
Not Assessed		NO
2022 Use Attainment Summary		
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for White Island Pond, East Basin (MA95166) so it is Not Assessed.		

White Island Pond, West Basin (MA95173)

Location:	(West Basin) Plymouth/Wareham.
AU Type:	FRESHWATER LAKE
AU Size:	123 ACRES
Classification/Qualifier:	B

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Brittle Naiad, Najas Minor*)		Added
4c	4c	(Curly-leaf Pondweed*)		Added
4c	4c	(Fanwort*)		Added
4c	4c	(Non-Native Aquatic Plants*)		Removed

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
(Brittle Naiad, Najas Minor*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
(Curly-leaf Pondweed*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				
(Fanwort*)	Introduction of Non-native Organisms (Accidental or Intentional) (Y)	X				

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Non-Native Aquatic Plants	Clarification of listing cause	The generic Non-Native Aquatic Plants impairment code is being removed since the species-specific Fanwort, Curly-leaf pondweed, and Brittle Naiad impairments are being added.

Recommendations

2022 Recommendations
ALU: Conduct an aquatic macrophyte survey of White Island Pond (West Basin) when flowering heads are present to determine if any non-native species of <i>Myriophyllum</i> are infesting the pond (confirmation of any non-native species should be made by a qualified state agency/taxonomist).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	

As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, fanwort (*Cabomba caroliniana*), in the White Island Pond West Basin during a July 1995 synoptic survey. In subsequent survey years (2011, 2012, 2014), DEP staff reported infestations of the non-native curly-leaf pondweed (*Potamogeton crispus*) and brittle naiad (*Najas minor*). They also noted the presence of *Myriophyllum* sp.; an aquatic macrophyte survey should be conducted to determine whether any of the non-native species of *Myriophyllum* are present in the pond. The Aquatic Life Use for White Island Pond, West Basin (MA95173) will continue to be assessed as Not Supporting; the generic Non-Native Aquatic Plants impairment is being removed since the other non-native aquatic macrophyte species impairments are being added (Fanwort, Curly-leaf pondweed, and Brittle naiad). An Alert is being identified due to the possibility of infestations of non-native species of *Myriophyllum* in the West Basin of White Island Pond.

Biological Monitoring Information

Non-native Aquatic Species Presence

MassDEP Non-Native Aquatic Invasive Species Records as of May 2021. (MassDEP 1995) (MassDEP Undated1)

Summary Statement	Assessment Recommendation
As was previously reported, MassDEP staff identified an infestation of the non-native aquatic macrophyte, fanwort (<i>Cabomba caroliniana</i>), in the White Island Pond West Basin during a July 1995 synoptic survey. In subsequent survey years (2011, 2012, 2014), DEP staff reported infestations of the non-native curly-leaf pondweed (<i>Potamogeton crispus</i>) and brittle naiad (<i>Najas minor</i>). They also noted the presence of <i>Myriophyllum</i> sp.- an aquatic macrophyte survey should be conducted to determine whether any of the non-native species of <i>Myriophyllum</i> are present in the pond and an Alert should be issued.	Conduct an aquatic macrophyte survey of White Island Pond (West Basin) when flowering heads are present to determine if any non-native species of <i>Myriophyllum</i> are infesting the pond.

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
Although fish toxics sampling was conducted in White Island Pond (West Basin) in 2000, no site-specific fish consumption advisory was issued by DPH. The Fish Consumption Use for White Island Pond, West Basin (MA95173) is Not Assessed.	

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for White Island Pond, West Basin (MA95173) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> or <i>E.coli</i> bacteria data are available to assess the Primary Contact Recreational Use for White Island Pond, West Basin (MA95173) so it is Not Assessed.	

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>E.coli</i> bacteria data are available to assess the Secondary Contact Recreational Use for White Island Pond, West Basin (MA95173) so it is Not Assessed.	

Whites Pond (MA95168)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	34 ACRES
Classification/Qualifier:	B

No usable data were available for Whites Pond (MA95168) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	3	None		Unchanged

Wild Harbor (MA95-20)

Location:	Waters landward of an imaginary line from Crow Point to Nyes Neck (excluding Wild Harbor River), Falmouth.
AU Type:	ESTUARY
AU Size:	0.13 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	4a	Estuarine Bioassessments	R1_EPA_MA_04	Changed
5	4a	Fecal Coliform	36172	Unchanged
5	4a	Nitrogen, Total	R1_EPA_MA_04	Changed
5	4a	Nutrient/Eutrophication Biological Indicators	R1_EPA_MA_04	Changed

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Golf Courses (Y)	X					
Estuarine Bioassessments	Impervious Surface/Parking Lot Runoff (Y)	X					
Estuarine Bioassessments	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Estuarine Bioassessments	Residential Districts (Y)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Golf Courses (Y)	X					
Nitrogen, Total	Impervious Surface/Parking Lot Runoff (Y)	X					
Nitrogen, Total	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nitrogen, Total	Residential Districts (Y)	X					
Nutrient/Eutrophication Biological Indicators	Golf Courses (Y)	X					
Nutrient/Eutrophication Biological Indicators	Impervious Surface/Parking Lot Runoff (Y)	X					
Nutrient/Eutrophication Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y)	X					
Nutrient/Eutrophication Biological Indicators	Residential Districts (Y)	X					

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Estuarine Bioassessments	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Wild Harbor Embayment System TMDLs for Nitrogen (Total) (Report CN 397.1, approved 2018-02-13, ATTAINS Action ID: R1_EPA_MA_04)
Nitrogen, Total	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Wild Harbor Embayment System TMDLs for Nitrogen (Total) (Report CN 397.1, approved 2018-02-13, ATTAINS Action ID: R1_EPA_MA_04)
Nutrient/Eutrophication Biological Indicators	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Wild Harbor Embayment System TMDLs for Nitrogen (Total) (Report CN 397.1, approved 2018-02-13, ATTAINS Action ID: R1_EPA_MA_04)

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	
<p>The MassDEP Eelgrass Mapping Project documented an ~33% loss of the eelgrass bed habitat in Wild Harbor between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at three locations in Wild Harbor, Falmouth (MA95-20) in the summers of 2015-2019, from inner to outer as follows: close to shore at the inner end of the harbor (BBC_WH1X), a little further from shore at the inner end (BBC_WH1N), and open waters in the middle of the harbor (BBC_WH3). The “inner harbor” is also known as the “boat basin”. Monitoring was conducted in the surface waters at all locations, as well as deeper in the water column at BBC_WH1X (at depths ranging 0.7-0.8m) and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 26°C (n=127). The minimum dissolved oxygen (DO) (all data from BBC_WH1X) was 1.5mg/L (n=112), measuring <6.0mg/L 37 times (~33% of the measurements overall) and <5.0mg/L 16 times (~14% of the measurements overall), with excursions spread fairly evenly between surface and depth measurements. Total nitrogen sampling during ebb tides in July and August (n=25, maximum 0.6mg/L) documented seasonal average total nitrogen concentrations between 0.3-0.47mg/L, with 2/5 calculations (both in the inner harbor) >0.35mg/L (the target concentration needed to restore eelgrass at the MEP sentinel station located in the inner harbor (Howes, Eichner and Samimy, et al. 2013B)). The maximum Chlorophyll <i>a</i> was 12.81µg/L (n=38), >5µg/L nine times, but was >10µg/L only twice in the inner harbor area. Secchi disk depth ranged from 0.7 to 4.5m (n=34). Ammonia-nitrogen concentrations were low (range 0.004 to 0.045mg/L (n=38)), but TUs could not be calculated (lack of quality assured pH and salinity data).</p> <p>The Aquatic Life Use for Wild Harbor (MA95-20) will continue to be assessed as Not Supporting based on the loss of eelgrass bed habitat documented by the MassDEP between 1995 and 2017 and the data collected by BBC staff/volunteers in the summers of 2015-2019. The Estuarine Bioassessments, Total Nitrogen, and Nutrient Eutrophication Biological Indicators impairments are all being carried forward.</p>	

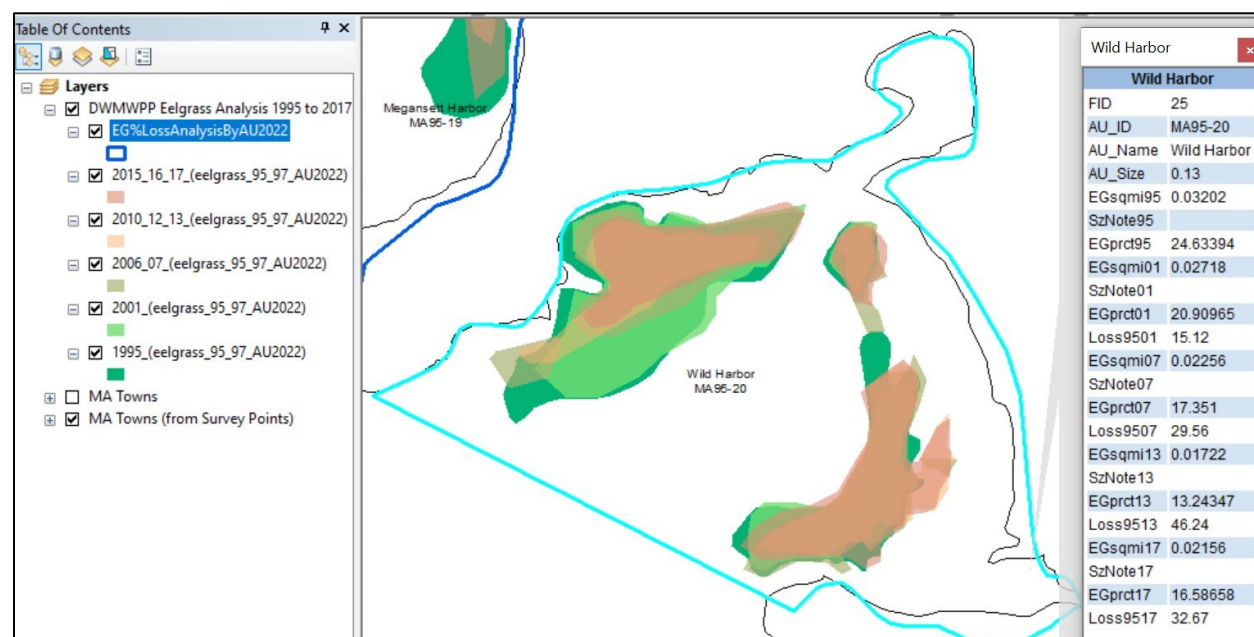
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_WH1N	Buzzards Bay Coalition	Water Quality	Wild Harbor	Wild Harbor Inner, Falmouth	41.640489	-70.64508
BBC_WH1X	Buzzards Bay Coalition	Water Quality	Wild Harbor	Wild Harbor Inner, Falmouth	41.640888	-70.643709
BBC_WH3	Buzzards Bay Coalition	Water Quality	Wild Harbor	Wild Harbor Outer, Falmouth	41.637348	-70.646454

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Wild Harbor MA95-20 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~33% loss of the eelgrass bed habitat in Wild Harbor between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_WH1X	06/05/15	09/23/15	0.2	6	2.0	6.6	17	17	17
BBC_WH1X	06/10/15	09/19/15	0.7	15	1.5	5.1	53	53	53
BBC_WH1X	07/05/16	09/20/16	0.1	2	5.0	5.8	50	0	0
BBC_WH1X	05/31/16	09/24/16	0.8	20	3.0	5.7	65	15	5
BBC_WH1X	05/30/17	09/20/17	0.8	23	3.0	6.2	22	9	4
BBC_WH1X	05/29/18	09/19/18	0.8	23	5.0	6.5	22	0	0
BBC_WH1X	05/30/19	09/23/19	0.8	23	3.0	6.4	17	9	4

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_WH1N	07/13/15	08/10/15	0.2	3	3	24.0	22.3	0
BBC_WH1N	07/05/16	08/15/16	0.2	4	4	26.0	24.0	0
BBC_WH1N	07/06/17	08/17/17	0.2	4	4	25.0	22.3	0
BBC_WH1N	07/10/18	08/21/18	0.2	4	4	23.0	16.0	0
BBC_WH1N	07/11/19	08/15/19	0.2	4	4	25.0	23.3	0
BBC_WH1X	06/05/15	09/23/15	0.2	6	5	24.0	20.8	0
BBC_WH1X	06/10/15	09/19/15	0.7	15	14	24.0	20.3	0
BBC_WH1X	07/05/16	09/20/16	0.1	2	1	21.0	21.0	0
BBC_WH1X	05/31/16	09/24/16	0.8	20	17	25.0	20.8	0
BBC_WH1X	05/30/17	09/20/17	0.8	22	19	24.4	19.1	0
BBC_WH1X	05/29/18	09/12/18	0.8	15	14	24.0	17.0	0
BBC_WH1X	05/30/19	09/23/19	0.8	22	19	25.0	20.7	0
BBC_WH3	07/13/15	08/10/15	0.2	3	3	24.0	22.0	0
BBC_WH3	07/05/16	08/15/16	0.2	4	4	25.0	23.5	0
BBC_WH3	07/06/17	08/17/17	0.2	4	4	24.0	21.8	0
BBC_WH3	07/10/18	08/21/18	0.2	4	4	24.0	16.3	0
BBC_WH3	07/11/19	08/15/19	0.2	4	4	25.0	22.5	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_WH1N	2015	0.2	3	0.43	0.49	0.47	3	5.88	12.73	8.26	0	1
BBC_WH1N	2016	0.2	3	0.26	0.60	0.39	4	1.96	5.00	3.77	4	0
BBC_WH1N	2017	0.2	2	0.28	0.59	0.44	4	3.80	5.25	4.55	2	0
BBC_WH1N	2018	0.2	2	0.33	0.34	0.33	4	3.40	12.81	6.64	2	1
BBC_WH1N	2019	0.2	2	0.43	0.47	0.45	4	3.96	5.82	4.85	3	0
BBC_WH3	2015	0.2	3	0.27	0.32	0.30	3	2.19	5.53	3.34	2	0
BBC_WH3	2016	0.2	2	0.35	0.38	0.36	4	2.17	4.11	2.84	4	0
BBC_WH3	2017	0.2	3	0.33	0.38	0.35	4	2.40	3.08	2.72	4	0
BBC_WH3	2018	0.2	3	0.25	0.47	0.33	4	2.78	4.33	3.32	4	0
BBC_WH3	2019	0.2	2	0.32	0.36	0.34	4	2.77	4.67	3.88	4	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_WH1N	07/27/15	07/27/15	1	2.1	2.1	2.1
BBC_WH1N	07/05/16	07/05/16	1	1.3	1.3	1.3
BBC_WH1N	07/10/18	08/07/18	3	1.7	2.2	2.0
BBC_WH1N	07/11/19	08/15/19	3	0.7	2.3	1.7

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_WH1X	08/30/15	08/30/15	1	0.7	0.7	0.7
BBC_WH1X	06/16/16	08/31/16	2	1.5	1.5	1.5
BBC_WH1X	06/06/17	09/06/17	3	1.1	1.5	1.3
BBC_WH1X	07/27/18	08/11/18	2	1.5	1.6	1.5
BBC_WH1X	08/13/19	08/13/19	1	1.1	1.1	1.1
BBC_WH3	07/13/15	07/27/15	2	2.9	3.3	3.1
BBC_WH3	07/05/16	08/15/16	4	1.3	3.6	2.6
BBC_WH3	07/06/17	08/03/17	3	2.9	4.0	3.4
BBC_WH3	07/10/18	08/21/18	4	1.2	4.5	2.7
BBC_WH3	07/11/19	08/15/19	4	1.1	2.9	2.3

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_WH1N	07/13/15	08/10/15	0.2	3	0.014	0.045	0.031
BBC_WH1N	07/05/16	08/15/16	0.2	4	0.005	0.020	0.011
BBC_WH1N	07/06/17	08/17/17	0.2	4	0.004	0.008	0.006
BBC_WH1N	07/10/18	08/21/18	0.2	4	0.004	0.041	0.013
BBC_WH1N	07/11/19	08/15/19	0.2	4	0.004	0.011	0.007
BBC_WH3	07/13/15	08/10/15	0.2	3	0.009	0.022	0.017
BBC_WH3	07/05/16	08/15/16	0.2	4	0.006	0.023	0.011
BBC_WH3	07/06/17	08/17/17	0.2	4	0.004	0.013	0.008
BBC_WH3	07/10/18	08/21/18	0.2	4	0.004	0.014	0.007
BBC_WH3	07/11/19	08/15/19	0.2	4	0.004	0.006	0.005

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Wild Harbor (MA95-20); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
Wild Harbor (MA95-20): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1251 sq mi (93%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.1251 sq mi (93%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area >= 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB52.0	Wild Harbor / Wild Harbor River	Prohibited	0.12511	93.2%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Wild Harbor (MA95-20) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There are three beaches in Wild Harbor, Falmouth (MA95-20), the names and ID codes for the beaches are as follows: New Silver (Silver Beach Improvement Association) (ID 2855), Wild Harbor Estates (ID 2843), and Bayshore Homeowners Association (ID 2825). These beaches were never posted for swimming between 2014 and 2019.</p> <p>The Primary Contact Recreational Use for Wild Harbor (MA95-20) is assessed as Fully Supporting since there were no swimming advisory postings at the New Silver (Silver Beach Improvement Association), Wild Harbor Estates, or Bayshore Homeowners Association beaches between 2014 and 2019.</p>	

Beach Postings

MassDPH Beach Posting Data Summary (% Bathing Season Posted 2014-2019) (Bailey, Logan Feb. 2, 2021) (MassDEP Undated4)

Beach ID	Beach Name/Town	Left Boundary (Latitude)	Left Boundary (Longitude)	Right Boundary (Latitude)	Right Boundary (Longitude)	2014	2015	2016	2017	2018	2019	# years > 10%
2825	Bayshore Homeowners Association/Falmouth	41.63133	-70.64350	41.63514	-70.64310	0%	0%	0%	0%	0%	0%	0
2843	Wild Harbour Estates/Falmouth	41.63768	-70.64320	41.63602	-70.64220	0%	0%	0%	0%	0%	0%	0
2855	New Silver (Silver Beach Improvement Association)/Falmouth	41.64025	-70.64510	41.63769	-70.64320	0%	0%	0%	0%	0%	0%	0

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Wild Harbor (MA95-20): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1251 sq mi (93%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Fully Supporting	NO
2022 Use Attainment Summary	
<p>There are three beaches in Wild Harbor, Falmouth (MA95-20), the names and ID codes for the beaches are as follows: New Silver (Silver Beach Improvement Association) (ID 2855), Wild Harbor Estates (ID 2843), and Bayshore Homeowners Association (ID 2825). These beaches were never posted for swimming between 2014 and 2019.</p> <p>The Secondary Contact Recreational Use for Wild Harbor (MA95-20) is assessed as Fully Supporting, since there were no swimming advisory postings at the New Silver (Silver Beach Improvement Association), Wild Harbor Estates, or Bayshore Homeowners Association beaches between 2014 and 2019.</p>	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
<p>Wild Harbor (MA95-20): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1251 sq mi (93%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.</p>

Wild Harbor River (MA95-68)

Location:	Headwaters, Falmouth to mouth at Wild Harbor, Falmouth.
AU Type:	ESTUARY
AU Size:	0.03 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	4a	Fecal Coliform	36172	Unchanged
5	4a	Nutrient/Eutrophication Biological Indicators	R1_EPA_MA_04	Changed

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Fecal Coliform	Source Unknown (N)			X			
Nutrient/Eutrophication Biological Indicators	Source Unknown (N)	X					

Supporting Information for Removed Impairments

2018/20 Removed Impairment	Removal Reason	Removal Comment
Nutrient/Eutrophication Biological Indicators	TMDL Approved or established by EPA (4a)	Impairment covered under TMDL: Final Wild Harbor Embayment System TMDLs for Nitrogen (Total) (Report CN 397.1, approved 2018-02-13, ATTAINS Action ID: R1_EPA_MA_04)

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at one location in Wild Harbor River, Falmouth (MA95-68) in the summers of 2015-2019, along the southern shore close to the downstream end of the AU (BBC_WH2). Monitoring was conducted in the surface waters, as well as at depths ranging 0.5-1.0m and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 28°C (n=102). The minimum dissolved oxygen (DO) was 3.5mg/L (n=90), measuring <6.0mg/L 42 times (~47% of the measurements overall, at the surface and at depth), and <5.0mg/L 20 times (~22% of the measurements overall). Total nitrogen sampling during ebb tides in July and August (n=16, maximum 0.57mg/L) documented seasonal average total nitrogen concentrations between 0.37-0.42mg/L. The maximum Chlorophyll *a* was 7.34µg/L (n=19), >5µg/L only twice. Three Secchi disk depths in the summers of 2015, 2018, and 2019 ranged from 0.6 to 1.0m. Ammonia-nitrogen concentrations were low (range 0.004 to 0.035mg/L (n=19)), but TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for Wild Harbor River (MA95-68) will continue to be assessed as Not Supporting with the Nutrient/Eutrophication Biological Indicators impairment being carried forward at this time. BBC data from 2015-2019 documented similar conditions to the 2006 MEP report which concluded that this basin is functioning as a “non-nitrogen impaired salt marsh dominated tidal creek” (Howes, Eichner and Samimy, et al. 2013B). The Aquatic Life Use for the Wild Harbor River will remain assessed as Not Supporting until it is agreed that the conditions are naturally occurring.

Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_WH2	Buzzards Bay Coalition	Water Quality	Wild Harbor River	Wild Harbor River, Falmouth	41.632898	-70.641581

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_WH2	08/07/15	08/07/15	0.2	1	6.0	6.0	0	0	0
BBC_WH2	08/14/15	09/23/15	0.9	9	4.0	7.4	22	11	0
BBC_WH2	08/10/16	08/24/16	0.2	2	3.9	5.4	50	50	50
BBC_WH2	08/10/16	08/10/16	0.5	1	7.1	7.1	0	0	0
BBC_WH2	06/06/17	08/21/17	0.2	6	4.5	5.9	33	17	0
BBC_WH2	06/12/17	09/17/17	0.8	16	4.5	5.8	44	19	0
BBC_WH2	05/30/18	09/11/18	0.2	4	5.0	5.9	75	0	0
BBC_WH2	05/30/18	09/19/18	0.8	24	3.5	5.9	50	29	4
BBC_WH2	06/04/19	09/18/19	0.2	8	4.5	6.1	38	13	0
BBC_WH2	06/04/19	09/23/19	1.0	19	4.0	5.4	63	32	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_WH2	07/13/15	08/10/15	0.2	4	4	22.0	20.8	0
BBC_WH2	08/14/15	09/23/15	1.0	9	7	25.0	23.0	0
BBC_WH2	07/05/16	08/24/16	0.2	6	6	25.0	23.5	0
BBC_WH2	08/10/16	08/10/16	0.5	1	1	25.0	25.0	0
BBC_WH2	06/06/17	08/21/17	0.2	10	10	26.0	21.1	0
BBC_WH2	06/12/17	09/17/17	0.8	16	15	25.3	21.8	0
BBC_WH2	05/30/18	09/11/18	0.2	8	7	28.0	19.3	0
BBC_WH2	05/30/18	09/19/18	0.8	26	24	28.0	22.1	0
BBC_WH2	06/04/19	09/18/19	0.2	12	11	26.5	22.4	0
BBC_WH2	06/04/19	09/23/19	1.0	19	17	26.7	22.9	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)

Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_WH2	2015	0.2	3	0.33	0.41	0.37	3	2.56	7.34	4.29	2	0
BBC_WH2	2016	0.2	4	0.28	0.51	0.40	4	2.53	4.65	3.50	4	0
BBC_WH2	2017	0.2	4	0.35	0.45	0.40	4	3.01	4.22	3.47	4	0
BBC_WH2	2018	0.2	4	0.33	0.57	0.42	4	2.35	3.70	3.34	4	0
BBC_WH2	2019	0.2	1	0.56	0.56	0.56	4	1.82	5.60	3.70	3	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_WH2	08/10/15	08/10/15	1	0.6	0.6	0.6
BBC_WH2	07/10/18	07/10/18	1	0.8	0.8	0.8
BBC_WH2	08/15/19	08/15/19	1	1.0	1.0	1.0

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_WH2	07/13/15	08/10/15	0.2	3	0.009	0.030	0.020
BBC_WH2	07/05/16	08/15/16	0.2	4	0.008	0.033	0.015
BBC_WH2	07/06/17	08/17/17	0.2	4	0.006	0.026	0.014
BBC_WH2	07/10/18	08/21/18	0.2	4	0.006	0.029	0.020
BBC_WH2	07/11/19	08/15/19	0.2	4	0.004	0.035	0.012

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Wild Harbor River (MA95-68); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	
Wild Harbor River (MA95-68): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0235 sq mi (80%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0235 sq mi (80%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area ≥ 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting.	

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB52.0	Wild Harbor / Wild Harbor River	Prohibited	0.02352	80.4%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Wild Harbor River (MA95-68) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Wild Harbor River (MA95-68) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Wild Harbor River (MA95-68): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0235 sq mi (80%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Wild Harbor River (MA95-68) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021)
(MassDEP Undated8)

Summary
Wild Harbor River (MA95-68): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0235 sq mi (80%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Wings Cove (MA95-105)

Location:	waters landward of a line from Great Hill Point to Piney Point, Marion.
AU Type:	ESTUARY
AU Size:	0.32 SQUARE MILES
Classification/Qualifier:	SA: SFO

2018/20 AU Category	2022 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	5	Estuarine Bioassessments		Added
--	5	Fecal Coliform		Added
--	5	Nitrogen, Total		Added

Impairment	Source (Confirmed Y/N)	Fish, other Aquatic Life and Wildlife	Fish Consumption	Shellfish Harvesting	Aesthetic	Primary Contact Recreation	Secondary Contact Recreation
Estuarine Bioassessments	Source Unknown (N)	X					
Fecal Coliform	Source Unknown (N)			X			
Nitrogen, Total	Source Unknown (N)	X					

Recommendations

2022 Recommendations
ALU: Conduct additional monitoring for nutrient enrichment indicators (especially chlorophyll <i>a</i>) on summer ebb tides for at least two “mid cove” locations in the Wings Cove AU (MA95-105).

Designated Use Attainment Decisions

Fish, other Aquatic Life and Wildlife

2022 Use Attainment	Alert
Not Supporting	YES
2022 Use Attainment Summary	

The MassDEP Eelgrass Mapping Project documented an ~65% loss of eelgrass bed habitat in Wings Cove between 1995 and 2017. The Buzzards Bay Coalition (BBC) staff/volunteers conducted discrete water quality monitoring at two locations in Wings Cove (MA95-105) in the summers of 2015-2019, from the inner to outer cove as follows: close to shore off a boat ramp at the head of the cove (BBC_WCM1) and from a dock on the south bank close to the outer edge of the AU (BBC_WCM2). Monitoring was conducted in the surface waters at both locations, as well as deeper in the water column at BBC_WCM2 (and once in 2019 at BBC_WCM1) at average depths ranging from 1.6 to 1.9m and was usually conducted weekly (between the hours of 6 and 9am). The maximum temperature was 27.0°C (n=300). The minimum dissolved oxygen (DO) was 2.5mg/L (n=304); <6.0mg/L 79 times (26% overall) and <5.0mg/L 33 times (11% of the measurements overall) between 2015-2019. Lowest concentrations occurred most frequently at the head of the cove (BBC_WCM1) (more than half of all surface measurements were <6.0mg/L at that location every year). Total nitrogen sampling (n=29, maximum 1.15mg/L at BBC_WCM1 in 2015) during ebb tides in July and-August documented seasonal average total nitrogen concentrations for sites/year with n>2 samples between 0.5-0.71mg/L (at BBC_WCM1 in 2015, 2017, 2018,-2019) and 0.33 and 0.46mg/L at BBC_WCM2 in 2018 and 2019, respectively. The maximum Chlorophyll *a* concentration was 31.4µg/L at BBC_WCM1 (n=20); >10µg/L usually at least once or twice a year at that station. However, further seaward at BBC_WCM2, the maximum was 10.1µg/L (n=20) and was almost never >10µg/L during the 2015 through 2019 surveys. Secchi disk depths in Wings Cove in the summers of 2015-2019 ranged from 0.1 to 1m (n=5) at BBC_WCM1 and 1.5-2.0m (n=66) at BBC_WCM2. Ammonia-nitrogen concentrations were generally low, (range 0.003 to 0.04mg/L, n=40), but TUs could not be calculated (lack of quality assured pH and salinity data). The Aquatic Life Use for Wings Cove (MA95-105) is assessed as Not Supporting based on the loss of eelgrass bed habitat documented by the MassDEP Eelgrass Mapping Project between 1995 and 2017 and the evidence of nutrient enriched conditions documented by the BBC staff/volunteers in 2015-2019, especially in the inner/head of the cove. Impairments for Estuarine Bioassessments and Total Nitrogen are being added, in agreement with the BBC comments made on the 2018/20 IR. Since the BBC_WCM1 sampling station is not deemed to be truly representative of the greater extent of the cove and could well experience wind and tide driven effects (i.e., pushing algae to the inner/head of the cove), Alert for Nutrient/Eutrophication Biological Indicators due to the elevated chlorophyll *a* and frequent low Dissolved Oxygen documented most often in the inner/head of the cove by the BBC in 2015-2019 are also being identified. Recommendations will be made to monitor for Nutrient/Eutrophication Biological Indicators at a mid-cove location.

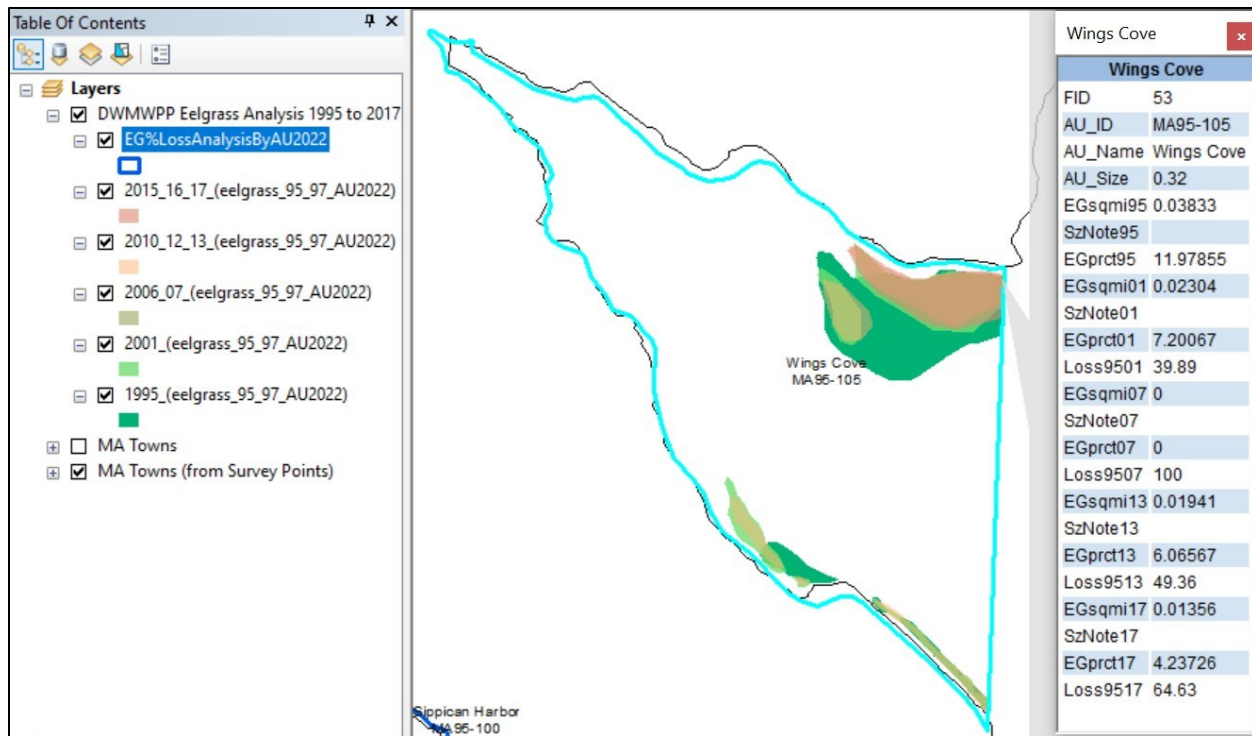
Monitoring Stations

Station Code	Organization	Type	Water Body	Station Description	Latitude	Longitude
BBC_WCM1	Buzzards Bay Coalition	Water Quality	Wings Cove	Wings Cove Inner, Marion	41.706266	-70.730453
BBC_WCM2	Buzzards Bay Coalition	Water Quality	Wings Cove	Wings Cove Outer, Marion	41.695179	-70.719337

Biological Monitoring Information

Primary Producers Data

Eelgrass analysis 1995-2017 for Wings Cove MA95-105 (MassGIS 2018, MassDEP Undated7):



The MassDEP Eelgrass Mapping Project documented an ~65% loss of eelgrass bed habitat in Wings Cove between 1995 and 2017.

Physico-chemical Water Quality Information

DO, pH, Temperature

Buzzards Bay Coalition Estuarine Discrete Dissolved Oxygen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[DO was measured at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	DO Count	DO Min (mg/L)	DO Avg (mg/L)	% Meas. <6.0	% Meas. <5.0	% Meas. <4.0
BBC_WCM1	05/28/15	09/22/15	0.1	18	2.5	5	78	39	22
BBC_WCM1	05/31/16	09/24/16	0.2	22	2.6	5.1	68	36	5
BBC_WCM1	06/01/17	09/19/17	0.2	19	3.6	5.2	63	42	5
BBC_WCM1	05/30/18	08/31/18	0.2	15	3.5	5.6	53	20	7
BBC_WCM1	06/10/19	09/24/19	0.2	13	3.1	5.3	69	38	8
BBC_WCM1	06/14/19	06/14/19	1.9	1	7.1	7.1	0	0	0
BBC_WCM2	05/28/15	09/23/15	0.2	22	6.0	7.4	0	0	0
BBC_WCM2	05/28/15	09/23/15	1.8	22	6.0	6.9	0	0	0
BBC_WCM2	06/01/16	09/25/16	0.2	22	6.0	7.0	0	0	0
BBC_WCM2	06/01/16	09/25/16	1.9	23	5.5	6.5	17	0	0
BBC_WCM2	05/31/17	09/19/17	0.2	22	5.5	6.2	23	0	0
BBC_WCM2	05/31/17	09/19/17	1.8	22	4.5	6.1	27	5	0
BBC_WCM2	05/29/18	09/20/18	0.2	21	6.0	6.8	0	0	0
BBC_WCM2	05/29/18	09/20/18	1.7	21	5.0	6.5	14	0	0
BBC_WCM2	05/30/19	09/23/19	0.2	22	3.9	7.1	9	5	5
BBC_WCM2	05/30/19	09/23/19	1.7	19	5.5	6.8	5	0	0

Buzzards Bay Coalition Discrete Estuarine Temperature Data (2014-2018). (BBC 2021) (MassDEP Undated4)

[Temperature was measured at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer Index is June 1 – Sept 15]

Station Code	Start Date	End Date	Average Sample Depth (m)	Temp Count	Index Count	Temp Max (°C)	Temp Avg (°C)	Count >29.4
BBC_WCM1	05/28/15	09/22/15	0.1	22	19	26.2	22.7	0
BBC_WCM1	05/31/16	09/24/16	0.2	26	22	27.0	24.3	0
BBC_WCM1	06/01/17	09/19/17	0.2	23	22	24.0	21.0	0
BBC_WCM1	06/06/18	08/31/18	0.2	18	18	26.5	23.0	0
BBC_WCM1	06/10/19	09/24/19	0.1	17	14	25.5	22.3	0
BBC_WCM1	06/14/19	06/14/19	1.9	1	1	17.5	17.5	0
BBC_WCM2	05/28/15	09/23/15	0.2	26	23	24.0	20.9	0
BBC_WCM2	05/28/15	09/23/15	1.8	22	19	24.0	20.5	0
BBC_WCM2	06/01/16	09/25/16	0.2	26	23	24.0	21.1	0
BBC_WCM2	06/01/16	09/25/16	1.9	22	19	24.0	20.6	0
BBC_WCM2	05/31/17	09/19/17	0.2	26	24	24.0	19.8	0
BBC_WCM2	05/31/17	09/19/17	1.8	22	20	23.0	19.1	0
BBC_WCM2	06/12/18	09/05/18	0.2	20	20	24.0	21.3	0
BBC_WCM2	06/12/18	09/16/18	1.6	18	17	24.0	21.0	0
BBC_WCM2	05/30/19	09/23/19	0.2	26	23	24.0	20.7	0
BBC_WCM2	05/30/19	09/23/19	1.7	19	16	23.0	19.9	0

Nutrients (Primary Producer Screening, Physico-chemical Screening)**Buzzards Bay Coalition Estuarine Nutrient Enrichment Indicator Data (2014-2019).** (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as “S” and “D”. Average sample depths at “S” and “D” for each year are presented in this table. Summer seasonal total nitrogen data collected May-Sept]

Station Code	Data Year	Average Sample Depth (m)	Seasonal TN Count	Seasonal TN Min (mg/L)	Seasonal TN Max (mg/L)	Seasonal TN Avg (mg/L)	Chl-a Count	Chl-a Min (µg/L)	Chl-a Max (µg/L)	Chl-a Avg (µg/L)	Chl-a Count ≤5	Chl-a Count >10
BBC_WCM1	2015	0.2	4	0.50	1.15	0.71	4	6.42	31.36	14.65	0	2
BBC_WCM1	2016	0.2	1	0.73	0.73	0.73	4	3.65	20.64	9.46	2	1
BBC_WCM1	2017	0.2	4	0.37	0.87	0.60	4	3.71	25.08	12.86	2	2
BBC_WCM1	2018	0.2	4	0.38	0.65	0.50	4	2.62	11.58	6.69	1	1
BBC_WCM1	2019	0.2	4	0.45	0.88	0.59	4	3.60	6.33	5.35	1	0
BBC_WCM2	2015	0.2	2	0.23	0.31	0.27	4	2.57	4.80	4.06	4	0
BBC_WCM2	2016	0.2	1	0.69	0.69	0.69	4	2.22	10.07	5.12	3	1
BBC_WCM2	2017	0.2	2	0.31	0.38	0.34	4	2.02	7.71	3.89	3	0
BBC_WCM2	2018	0.2	4	0.26	0.37	0.33	4	2.82	6.67	4.08	3	0
BBC_WCM2	2019	0.2	3	0.24	0.65	0.46	4	3.76	8.74	5.49	2	0

Buzzards Bay Coalition Secchi Disk Depth Data (2014-2019). (BBC 2021) (MassDEP Undated4)

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_WCM1	08/10/15	08/10/15	1	0.2	0.2	0.2
BBC_WCM1	07/18/16	08/15/16	2	0.2	0.2	0.2

Station Code	Start Date	End Date	Secchi Disk Depth Count	Secchi Disk Depth Min (m)	Secchi Disk Depth Max (m)	Secchi Disk Depth Avg (m)
BBC_WCM1	06/14/19	08/15/19	2	0.2	1.8	1.0
BBC_WCM2	05/28/15	08/29/15	12	1.3	2.6	2.0
BBC_WCM2	06/01/16	09/16/16	14	1.1	2.3	1.9
BBC_WCM2	06/07/17	09/19/17	16	0.7	2.2	1.8
BBC_WCM2	05/29/18	09/20/18	14	0.8	1.8	1.5
BBC_WCM2	05/30/19	09/13/19	10	1.4	2.1	1.8

Public comment submitted by Buzzards Bay Coalition as part of the 2018/20 IR

C. Wings Cove Fails to Meet State Water Quality Standards and Must be Listed on the 2018/2020 List of Category 5 Waters for Total Nitrogen.

The Coalition requests that Wings Cove be listed as impaired for total nitrogen. The Coalition's water quality monitoring data support its listing.



Figure 9. Wings Cove Site Map

Wings Cove demonstrates water quality decline related to excess nutrients. As described above, excessive levels of nitrogen are common in southeastern Massachusetts and result in ecosystem degradation with impacts including loss of eelgrass beds, algae blooms, fish kills and reductions in important marine life. In order to target areas suffering from excessive levels of nitrogen, like Wings Cove, and remove as much nitrogen as possible from these areas, it is imperative that MassDEP list Wings Cove as impaired for total nitrogen, requiring a TMDL for nitrogen.

1. Wings Cove Dissolved Oxygen

The Coalition submits oxygen data from multiple years from stations WCM1 and WCM2 depicting water quality impairment due to nutrient over-enrichment. The Coalition's dissolved oxygen data show that Wings Cove consistently falls below the numeric criteria of 6 mg/L as designated in 314 CMR 4.05(4)(a)(1)(a) and warrants listing on the 303(d) list.

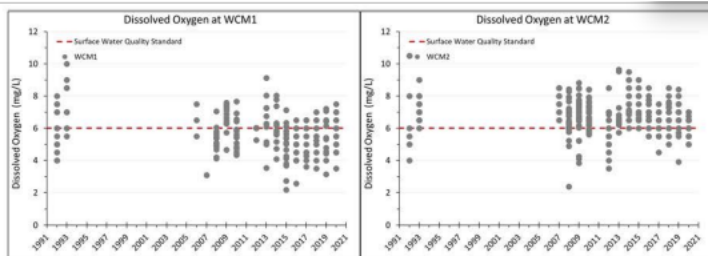


Figure 10. Dissolved Oxygen Concentrations in Wings Cove

The dissolved oxygen concentrations in Figure 10 clearly shows a significant number of samples below the numeric dissolved oxygen criteria established in the Massachusetts Surface Water Quality Standards, particularly at station WCM1 in the inner portion of Wings Cove.

2. Chlorophyll Data

The Coalition's chlorophyll data show that Wings Cove does not possess the excellent aesthetic values required of SA waters pursuant to 314 CMR 4.05(4)(a), "These waters shall have excellent aesthetic value" and warrants listing on the 303(d) list.

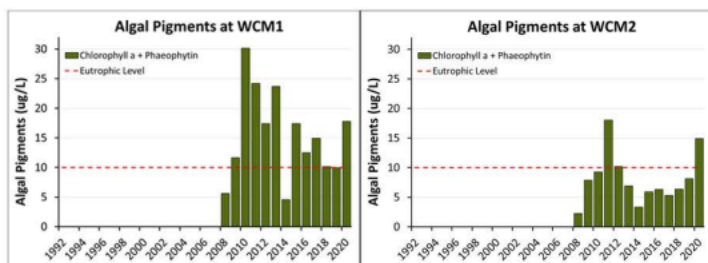


Figure 11. Phytoplankton Pigments in Wings Cove

The data presented in Figure 11 show high levels of algal pigments at sampling stations WCM1 and WCM2. The high concentrations of chlorophyll indicate degraded water clarity in violation of the excellent aesthetic value required in Massachusetts Surface Water Quality Standards.

3. Wings Cove Total Nitrogen Data

The Coalition's total nitrogen data for Wings Cove suggests that the nitrogen levels are leading to the low dissolved oxygen numbers and promoting the algae growth depicted above.

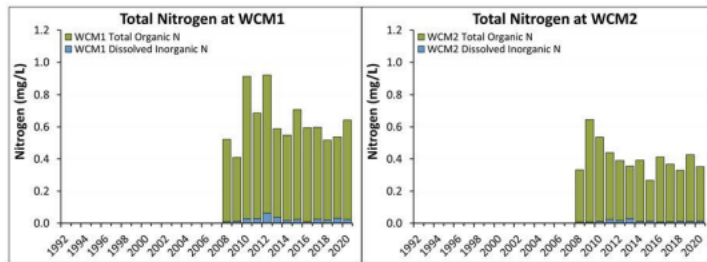


Figure 12. Total Nitrogen in Wings Cove

Figure 12 exhibits high total nitrogen concentrations in Wings Cove, typically greater than 0.5 mg/L at WCM1 in the inner cove and reaching close to 1 mg/L in some years. The incidences of high total nitrogen concentrations and high chlorophyll indicate that Wings Cove fails to attain state water quality standards and must be listed on the 303d list as impaired for total nitrogen.

The combined data above demonstrate that Wings Cove is suffering from eutrophication due to excess nutrients and must be listed on the Commonwealth of Massachusetts' 303(d) list of Category 5 waters requiring a TMDL for total nitrogen. Dissolved oxygen data at sampling sites WCM1 and WCM2 are in clear violation of surface water quality standards, falling below dissolved oxygen levels of 6 mg/L. Sampling sites WCM1 and WCM2 also have elevated chlorophyll levels that degrade water clarity and aesthetic value, as well as high total nitrogen concentrations.

Toxics and other pollutants (metals, ammonia, chlorine)

Buzzards Bay Coalition Ammonia-Nitrogen Data (2014-2019). (BBC 2021) (MassDEP Undated4)

[Samples were collected at a variety of depths originally categorized by BBC as "S" and "D". Average sample depths at "S" and "D" for each year are presented in this table.]

Station Code	Start Date	End Date	Average Sample Depth (m)	NH3 Count	NH3 Min (mg/L)	NH3 Max (mg/L)	NH3 Avg (mg/L)
BBC_WCM1	07/13/15	08/25/15	0.2	4	0.009	0.017	0.014
BBC_WCM1	07/05/16	08/15/16	0.2	4	0.007	0.008	0.007
BBC_WCM1	07/06/17	08/17/17	0.2	4	0.004	0.041	0.014
BBC_WCM1	07/10/18	08/21/18	0.2	4	0.003	0.015	0.01
BBC_WCM1	07/11/19	08/15/19	0.2	4	0.010	0.026	0.018
BBC_WCM2	07/13/15	08/25/15	0.2	4	0.009	0.015	0.011
BBC_WCM2	07/05/16	08/15/16	0.2	4	0.004	0.008	0.006
BBC_WCM2	07/06/17	08/17/17	0.2	4	0.004	0.010	0.007
BBC_WCM2	07/10/18	08/21/18	0.2	4	0.004	0.005	0.005
BBC_WCM2	07/11/19	08/15/19	0.2	4	0.004	0.014	0.008

Fish Consumption

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No fish toxics monitoring has been conducted in Wings Cove (MA95-105); therefore, the Fish Consumption Use is Not Assessed.	

Shellfish Harvesting

2022 Use Attainment	Alert
Not Supporting	NO
2022 Use Attainment Summary	

Wings Cove (MA95-105): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.3103 sq mi (97%). The approved shellfish growing area represents 0.2587 sq mi (81%). The Shellfish Harvesting Use is assessed as Not Supporting because the growing area (normalized to the AU area) is < 100% approved. Based on the new growing area classifications, a fecal coliform impairment is being added.

Shellfish Growing Area Classifications

MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Area Name	Waterbody/Area Description	Classification	Area (Sq. Mi.)	Area (% of AU)
BB33.0	Stony Point Dike	Approved	0.00008	0.0%
BB34.0	Wings Cove	Approved	0.25859	80.6%
BB34.1	West Wings Cove	Conditionally Approved	0.05163	16.1%

Aesthetic

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No data are available to assess the status of the Aesthetic Use for Wings Cove (MA95-105) so it is Not Assessed.	

Primary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Primary Contact Recreational Use for Wings Cove (MA95-105) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Wings Cove (MA95-105): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.3103 sq mi (97%). The approved shellfish growing area represents 0.2587 sq mi (81%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

Secondary Contact Recreation

2022 Use Attainment	Alert
Not Assessed	NO
2022 Use Attainment Summary	
No <i>Enterococci</i> bacteria data are available to assess the Secondary Contact Recreational Use for Wings Cove (MA95-105) so it is Not Assessed.	

Shellfish Growing Area Classifications

MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data (Bettencourt August 25, 2021) (MassDEP Undated8)

Summary
Wings Cove (MA95-105): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.3103 sq mi (97%). The approved shellfish growing area represents 0.2587 sq mi (81%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data.

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