Appendix 23
South Shore Coastal Drainage Area
Assessment and Listing Decision Summary

Final Massachusetts Integrated List of Waters for the Clean Water Act 2018/2020 Reporting Cycle

CN: 505.1

November 2021

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2018/20 Cycle Impairment Changes

Waterbody	AU_ID	2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
Aaron River	MA94-28	5	5	(Fanwort*)		Added
Aaron River	MA94-28	5	5	(Fish Passage Barrier*)		Removed
Aaron River Reservoir	MA94178	4a	4a	(Fish Passage Barrier*)		Removed
Beaver Dam Brook	MA94-65	--	3	(Non-Native Aquatic Plants*)		Removed
Billington Sea	MA94007	5	5	Chlorophyll-a		Added
Billington Sea	MA94007	5	5	Dissolved Oxygen Supersaturation		Added
Billington Sea	MA94007	5	5	(Fanwort*)		Added
Billington Sea	MA94007	5	5	Nutrient/Eutrophication Biological Indicators		Added
Billington Sea	MA94007	5	5	Phosphorus, Total		Added
Boot Pond	MA94016	3	5	Dissolved Oxygen		Added
Bound Brook	MA94-18	5	5	(Fish Passage Barrier*)		Removed
Briggs Reservoir	MA94019	4c	4c	(Fanwort*)		Added
Briggs Reservoir	MA94019	4c	4c	(Non-Native Aquatic Plants*)		Removed
Briggs Reservoir	MA94020	4c	4c	(Fanwort*)		Added
Briggs Reservoir	MA94020	4c	4c	(Non-Native Aquatic Plants*)		Removed
Cooks Pond	MA94027	4c	4c	(Fanwort*)		Added
Drinkwater River	MA94-21	5	5	(Curly-leaf Pondweed*)		Added
Drinkwater River	MA94-21	5	5	Dissolved Oxygen		Removed
Drinkwater River	MA94-21	5	5	(Fanwort*)		Added
Drinkwater River	MA94-21	5	5	(Non-Native Aquatic Plants*)		Removed
Drinkwater River	MA94-21	5	5	Nutrient/Eutrophication Biological Indicators		Added
Drinkwater River	MA94-21	5	5	Trash		Changed
Duxbury Bay	MA94-15	4a	5	Estuarine Bioassessments		Added
Eel River	MA94-37	4c	2	(Fish Passage Barrier*)		Removed
Eel River	MA94-37	4c	2	(Non-Native Aquatic Plants*)		Removed
Eel River	MA94-38	4c	5	Benthic Macroinvertebrates		Added
Eel River	MA94-38	4c	5	(Fanwort*)		Added
Eel River	MA94-38	4c	5	(Fish Passage Barrier*)		Removed
Eel River	MA94-38	4c	5	(Non-Native Aquatic Plants*)		Removed
Factory Pond	MA94175	5	5	(Fish Passage Barrier*)		Added
First Herring Brook	MA94-36	2	4c	(Fish Passage Barrier*)		Added
First Herring Brook	MA94-63	--	4c	(Fish Passage Barrier*)		Added
French Stream	MA94-03	5	5	Whole Effluent Toxicity (WET)		Removed
Furnace Pond	MA94043	5	5	(Fanwort*)		Added

Waterbody	AU_ID	2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
Great Herring Pond	MA94050	4a	5	Dissolved Oxygen		Added
Great South Pond	MA94054	4a	5	Dissolved Oxygen		Added
Halls Brook	MA94-58	--	4c	(Fish Passage Barrier*)		Added
Herring Brook	MA94-29	4c	4c	(Fanwort*)		Added
Herring Brook	MA94-29	4c	4c	(Fish Passage Barrier*)		Removed
Indian Brook	MA94-51	--	5	(Fanwort*)		Added
Indian Brook	MA94-51	--	5	(Non-Native Aquatic Plants*)		Added
Indian Brook	MA94-51	--	5	Nutrient/Eutrophication Biological Indicators		Added
Indian Brook	MA94-51	--	5	Phosphorus, Total		Added
Indian Head Brook	MA94-49	--	4c	(Fish Passage Barrier*)		Added
Indian Head Brook	MA94-50	--	4c	(Fish Passage Barrier*)		Added
Indian Head Pond	MA94071	5	5	(Fish Passage Barrier*)		Added
Indian Head River	MA94-04	5	5	Dissolved Oxygen		Removed
Indian Head River	MA94-04	5	5	(Fish Passage Barrier*)		Added
Indian Head River	MA94-04	5	5	Phosphorus, Total		Removed
Island Creek	MA94-46	--	4c	(Fish Passage Barrier*)		Added
Island Creek Pond	MA94073	4c	4c	(Fanwort*)		Added
Island Creek Pond	MA94073	4c	4c	(Fish Passage Barrier*)		Added
Island Creek Pond	MA94073	4c	4c	(Non-Native Aquatic Plants*)		Removed
Island Pond	MA94075	4c	4c	(Fanwort*)		Added
Island Pond	MA94075	4c	4c	(Non-Native Aquatic Plants*)		Removed
Jacobs Pond	MA94077	4c	4c	(Fanwort*)		Added
Jacobs Pond	MA94077	4c	4c	(Fish Passage Barrier*)		Added
Jones River	MA94-14	4a	5	Fish Bioassessments		Added
Jones River	MA94-14	4a	5	Nutrient/Eutrophication Biological Indicators		Added
Lily Pond	MA94179	5	5	(Curly-leaf Pondweed*)		Added
Lily Pond	MA94179	5	5	(Fanwort*)		Added
Lily Pond	MA94179	5	5	(Fish Passage Barrier*)		Removed
Long Island Pond	MA94088	4c	4c	(Fanwort*)		Added
Lower Chandler Pond	MA94091	4c	4c	(Fanwort*)		Added
Lower Chandler Pond	MA94091	4c	4c	(Non-Native Aquatic Plants*)		Removed
Old Oaken Bucket Pond	MA94113	5	5	(Fanwort*)		Added

Waterbody	AU_ID	2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
Oldham Pond	MA94114	5	5	(Eurasian Water Milfoil, Myriophyllum Spicatum*)		Added
Oldham Pond	MA94114	5	5	(Non-Native Aquatic Plants*)		Removed
Oldham Pond	MA94114	5	5	(Non-Native Fish/Shellfish/Zooplankton*)		Added
Pembroke Street South Pond	MA94117	4c	4c	(Fanwort*)		Added
Pembroke Street South Pond	MA94117	4c	4c	(Non-Native Aquatic Plants*)		Removed
Plymouth Harbor	MA94-16	5	5	Estuarine Bioassessments		Added
Plymouth Harbor	MA94-16	5	5	Nutrient/Eutrophication Biological Indicators		Removed
Reeds Millpond	MA94126	4c	4c	(Fanwort*)		Added
Reeds Millpond	MA94126	4c	4c	(Non-Native Aquatic Plants*)		Removed
Reservoir	MA94186	--	4c	(Fish Passage Barrier*)		Added
Russell Millpond	MA94132	5	5	Dissolved Oxygen		Added
Russell Millpond	MA94132	5	5	(Fish Passage Barrier*)		Removed
Russell Pond	MA94133	3	4c	(Fanwort*)		Added
Russell Pond	MA94133	3	4c	(Fish Passage Barrier*)		Added
Savery Pond	MA94136	5	5	Nutrient/Eutrophication Biological Indicators		Added
Savery Pond	MA94136	5	5	Phosphorus, Total		Added
Scituate Harbor	MA94-02	4a	5	Estuarine Bioassessments		Added
Second Herring Brook	MA94-26	2	4c	(Fish Passage Barrier*)		Added
Silver Lake	MA94143	4c	5	Dissolved Oxygen		Added
Silver Lake	MA94143	4c	5	(Fish Passage Barrier*)		Added
Smelt Brook	MA94-54	--	5	(Fish Passage Barrier*)		Added
Smelt Pond	MA94184	4c	4c	(Fanwort*)		Added
Smelt Pond	MA94184	4c	4c	(Fish Passage Barrier*)		Added
South River	MA94-08	2	5	Dissolved Oxygen		Added
South River	MA94-08	2	5	(Fish Passage Barrier*)		Added
Tack Factory Pond	MA94152	2	4c	(Fish Passage Barrier*)		Added
Third Herring Brook	MA94-27	2	4c	(Fish Passage Barrier*)		Added
Torrey Pond	MA94157	4c	4c	(Fanwort*)		Added
Torrey Pond	MA94157	4c	4c	(Fish Passage Barrier*)		Added
Torrey Pond	MA94157	4c	4c	(Non-Native Aquatic Plants*)		Removed
Town Brook	MA94-42	2	4c	(Curly-leaf Pondweed*)		Added
Town Brook	MA94-42	2	4c	(Non-Native Aquatic Plants*)		Added
Unnamed Tributary	MA94-35	2	4c	(Fish Passage Barrier*)		Added
Unnamed Tributary	MA94-53	--	4c	(Fish Passage Barrier*)		Added
Unnamed Tributary	MA94-59	--	4c	(Fish Passage Barrier*)		Added

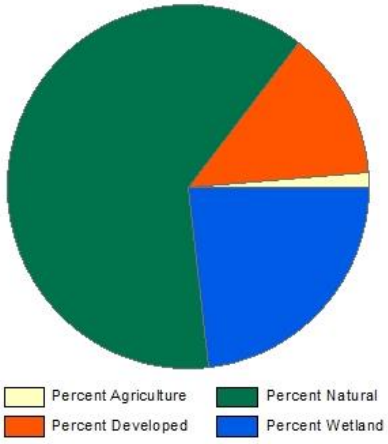
Waterbody	AU_ID	2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
Unnamed Tributary	MA94-61	--	4c	(Fish Passage Barrier*)		Added
Wampatuck Pond	MA94168	5	5	(Fanwort*)		Added
Wampatuck Pond	MA94168	5	5	(Fish Passage Barrier*)		Added
Wampatuck Pond	MA94168	5	5	(Non-Native Aquatic Plants*)		Removed

Aaron River (MA94-28)

Location:	Outlet Aaron River Reservoir, Cohasset to flow control structure near Beechwood Street (confluence with Bound Brook), Cohasset.
AU Type:	RIVER
AU Size:	1 MILES
Classification/Qualifier:	A: PWS, ORW

Aaron River - MA94-28

Watershed Area: 8.88 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	8.71	7.61	1.53	1.38
Agriculture	1.2%	0.4%	0.3%	0.3%
Developed	13.4%	12.5%	13%	12.6%
Natural	62.3%	65%	50%	51.5%
Wetland	23.2%	22%	36.7%	35.6%
Impervious Cover	4.8%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Fanwort*)		Added
5	5	(Fish Passage Barrier*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
Dense growth of the non-native aquatic macrophyte *Cabomba caroliniana* was observed in the Aaron River upstream from the Beechwood Street Dam so the Aquatic Life Use continues to be assessed as impaired. The barriers to fish passage however have been removed.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Fish Passage Barrier	Applicable WQS attained, due to restoration activities	Two projects have improved habitat in this watershed area: Culvert reconstruction at the Beechwood Street Dam was conducted in 2016. DMF scores passage =3 and notes the site/fishway design will be limited by water supply operations and the Hunters Pond Dam in Scituate/Cohasset was removed between July and

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
		September 2017. The spillway was notched to ensure a gradual release of water from the impoundment, letting Bound Brook flow free again after being dammed for centuries. As the first barrier upstream from the Atlantic Ocean, the dam's removal restores 5-miles of river spawning ground and habitat for alewife, blueback herring, American eel, rainbow smelt, sea lamprey and other important species. The project was funded by grants from the Massachusetts Department of Ecological Restoration and the NOAA and included many other project partners including the Town of Scituate, Princeton Hydro, T Ford Company, and the U.S. Fish and Wildlife Service (http://scituate.wickedlocal.com/news/20170901/hunters-pond-dam-dam-removal-paves-way-for-improvements and http://www.princetonhydro.com/blog/dam-removal/

Supporting Information for Delisted Impairments

Fish Passage Barrier

According to DMF biologists (Chase 2016, Chase 2017) two projects have improved diadromous fish habitat in this subwatershed area:

1. Culvert reconstruction at the Beechwood Street Dam was conducted in 2016. DMF scores passage =3 and notes the site/fishway design will be limited by water supply operations.

2. The Hunters Pond Dam in Scituate and Cohasset, Massachusetts was removed between July and September 2017. The spillway was notched to ensure a gradual release of water from the impoundment, letting Bound Brook flow free again after being dammed for centuries. As the first barrier upstream from the Atlantic Ocean, the dam's removal restores 5-miles of river spawning ground and habitat for alewife, blueback herring, American eel, rainbow smelt, sea lamprey and other important species. The project was funded by grants from the Massachusetts Department of Ecological Restoration and the NOAA and included many other project partners including the Town of Scituate, Princeton Hydro, T Ford Company, and the U.S. Fish and Wildlife Service (http://scituate.wickedlocal.com/news/20170901/hunters-pond-dam-dam-removal-paves-way-for-improvements and http://www.princetonhydro.com/blog/dam-removal/

Aaron River Reservoir (MA94178)

Location:	Cohasset/Hingham/Scituate.
AU Type:	FRESHWATER LAKE
AU Size:	136 ACRES
Classification/Qualifier:	A: PWS, ORW

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	(Fish Passage Barrier*)		Removed

Fish, other Aquatic Life and Wildlife Use: Insufficient Information (Alert)
Two projects have improved diadromous fish habitat in this watershed area: reconstruction at the Beechwood Street Dam was conducted in 2016. DMF scores passage =3 and notes the site/fishway design will be limited by water supply operations and the Hunters Pond Dam in Scituate and Cohasset, Massachusetts was removed between July and September 2017. An infestation of *Myriophyllum heterophyllum* in Aaron River Reservoir has been reported to MassDEP (MassDEP Undated). Until confirmation of this non-native aquatic macrophyte species is made, the *Aquatic Life Use* will be identified with an Alert Status. No other data available to assess Aquatic Life Use.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Fish Passage Barrier	Applicable WQS attained, due to restoration activities	Two projects have improved diadromous fish habitat in this watershed area: reconstruction at the Beechwood Street Dam was conducted in 2016. DMF scores passage =3 and notes the site/fishway design will be limited by water supply operations and the Hunters Pond Dam in Scituate and Cohasset, Massachusetts was removed between July and September 2017. The spillway was notched to ensure a gradual release of water from the impoundment, letting Bound Brook flow free again after being dammed for centuries. As the first barrier upstream from the Atlantic Ocean, the dam's removal restores 5-miles of river spawning ground and habitat for alewife, blueback herring, American eel, rainbow smelt, sea lamprey and other important species. The project was funded by grants from the Massachusetts Department of Ecological Restoration and the NOAA and included many other project partners including the Town of Scituate, Princeton Hydro, T Ford Company, and the U.S. Fish and Wildlife Service (http://scituate.wickedlocal.com/news/20170901/hunters-pond-dam-dam-removal-paves-way-for-improvements and http://www.princetonhydro.com/blog/dam-removal/. Existing fishway at Aaron River Reservoir Dam reported to be in good condition (DMF passage score 3).

Supporting Information for Delisted Impairments

Fish Passage Barrier

According to DMF biologists (Chase 2016, Chase 2017) two projects have improved diadromous fish habitat in this subwatershed area:

1. Culvert reconstruction at the Beechwood Street Dam was conducted in 2016. DMF scores passage =3 and notes the site/fishway design will be limited by water supply operations.

2. The Hunters Pond Dam in Scituate and Cohasset, Massachusetts was removed between July and September 2017. The spillway was notched to ensure a gradual release of water from the impoundment, letting Bound Brook flow free again after being dammed for centuries. As the first barrier upstream from the Atlantic Ocean, the dam's removal restores 5-miles of river spawning ground and habitat for alewife, blueback herring, American eel, rainbow smelt, sea lamprey and other important species. The project was funded by grants from the Massachusetts Department of Ecological Restoration and the NOAA and included many other project partners including the Town of Scituate, Princeton Hydro, T Ford Company, and the U.S. Fish and Wildlife Service (http://scituate.wickedlocal.com/news/20170901/hunters-pond-dam-dam-removal-paves-way-for-improvements and http://www.princetonhydro.com/blog/dam-removal/

The existing fishway at the Aaron River Reservoir Dam is reported to be in good condition with a passage score = 3 (Chase 2017).

Arnold School Pond (MA94004)

Location:	Pembroke.
AU Type:	FRESHWATER LAKE
AU Size:	12 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data available to assess the Aquatic Life Use of Arnold School Pond.

Bartlett Pond (MA94005)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	33 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Insufficient Information (Alert)

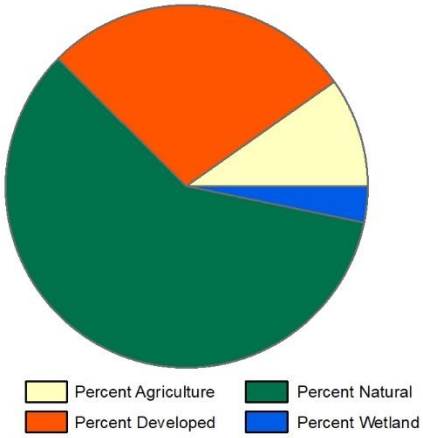
Water quality sampling was conducted in Bartlett Pond by MassDEP during the summer of 2008 (one day each in June, July, and August). DO concentrations were all good (≥6.6 mg/L) however saturation was as high as 132% during the 17 July 2008 survey. During these surveys the chlorophyll a concentrations ranged from 6.0 to 21.4µg/L with two of three samples (both July and August samples) exceeding 16 µg/L. The total phosphorus concentrations were also elevated (0.12 to 0.16 mg/L) during all three surveys. Secchi disk depths ranged from 1.1 to 1.4m (MassDEP UndatedA). The Town of Plymouth's deep hole depth profile data collected in Bartlett Pond on 8 September 2015 documented oxygen concentrations good at both depths measured (DO minimum 8.3mg/L) and there was no evidence of supersaturation. The Town also collected some water quality data on 4 September 2014. On this survey the chlorophyll a concentration was 11.24 µg/L with somewhat elevated total phosphorus concentrations (higher near the bottom at 0.049 mg/L) which were much lower than the concentrations measured during the summer of 2008. Secchi disk depth was reported to be at the bottom (1.1m) (Eichner et al. 2015). A major ecological restoration effort however, the Tidmarsh Farms Restoration Project, has been underway since 2010 in the upper watershed area draining to Bartlett Pond. Restoration efforts in the Beaver Dam Brook subwatershed have been undertaken in two parts Tidmarsh Farms East and Tidmarsh Farms West. According to Mand (2016), "*Over the past year excavators dug 3.5 miles of sinuous stream channel, along with two ponds and several wet depressions. They also filled ditches, removed 13 dams, roughened the bog surfaces to expose the underlying peat substrate, and sprinkled large logs across the expanse to begin the process of creating natural habitat for a variety of species.*"
Since major changes have been occurring in the upper watershed of Bartlett Pond, the Aquatic Life Use will not be assessed since there is insufficient information to evaluate current conditions. This use will be identified with an Alert Status however based on evidence of enrichment (elevated chlorophyll a concentrations in June and July 2008, the supersaturated conditions (132%) during the July 2008 survey), as well as the very high concentrations of total phosphorus during the summer of 2008 and the lower but still slightly elevated concentrations of total phosphorus measured in the summer of 2014.

Beaver Dam Brook (MA94-65)

Location:	Headwaters east of Long Island Pond, Plymouth to mouth at inlet Bartlett Pond, Plymouth (through former 2016 segment: Beaver Dam Pond MA94006).
AU Type:	RIVER
AU Size:	2.6 MILES
Classification/Qualifier:	B

Beaver Dam Brook - MA94-65

Watershed Area: 4.73 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	4.73	4.73	1.3	1.3
Agriculture	9.8%	9.8%	32.5%	32.5%
Developed	27.6%	27.6%	16.4%	16.4%
Natural	59%	59.4%	49.3%	49.3%
Wetland	3.2%	3.22%	6.4%	6.4%
Impervious Cover	11.6%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	3	(Non-Native Aquatic Plants*)		Removed

Fish, other Aquatic Life and Wildlife Use: Insufficient Information
Restoration of Beaver Dam Brook took place in 2016 as part of Tidmarsh Farms Restoration Project. Excavators dug 3.5 miles of sinuous stream channel among other habitat restoration efforts. The system is in a recovery phase and therefore no Aquatic Life Use assessment is being made for the 2018 reporting cycle.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Applicable WQS attained, due to restoration activities	Beaver Dam Pond dam was removed (former AU MA94006) and the restoration of Beaver Dam Brook was undertaken during the Tidmarsh Farms Restoration Project. In 2016 excavators dug 3.5 miles of sinuous stream channel, along with two ponds and several wet depressions. They also filled ditches, removed 13 dams,

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
		roughened the bog surfaces to expose the underlying peat substrate, and sprinkled large logs across the expanse to begin the process of creating natural habitat for a variety of species. Based on an October 2016 Plants of Tidmarsh Farms and Vicinity listing available online through the Living Observatory website Plant Species Lists (http://geo.salicicola.com/tidmarsh/plants/checklist/text/), there was no documented occurrence of Cabomba caroliniana so this impairment is being removed.

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

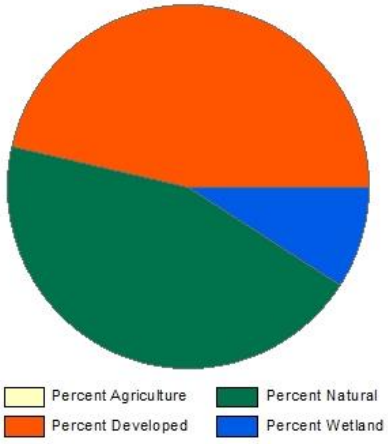
The non-native aquatic species, *Cabomba caroliniana*, was noted in Beaver Dam Pond during the 1996 DWM synoptic survey (MassDEP 1996). Beaver Dam Pond dam was removed (former AU MA94006) and the restoration of Beaver Dam Brook was undertaken during the Tidmarsh Farms Restoration Project. In 2016 excavators dug 3.5 miles of sinuous stream channel, along with two ponds and several wet depressions. They also filled ditches, removed 13 dams, roughened the bog surfaces to expose the underlying peat substrate, and sprinkled large logs across the expanse to begin the process of creating natural habitat for a variety of species. Based on an October 2016 Plants of Tidmarsh Farms and Vicinity listing available online (http://geo.salicicola.com/tidmarsh/plants/checklist/text/), there was no documented occurrence of *Cabomba caroliniana* so this impairment is being removed.

BEN MANN BROOK (MA94-41)

Location:	Headwaters, south of Abington Rockland Reservoir, Rockland to mouth at confluence with Cushing Brook, Hanover.
AU Type:	RIVER
AU Size:	2 MILES
Classification/Qualifier:	B

Ben Mann Brook - MA94-41

Watershed Area: 1.79 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.79	1.79	0.8	0.8
Agriculture	0.2%	0.2%	0%	0%
Developed	46.4%	46.4%	34.6%	34.6%
Natural	44.2%	44.2%	52.6%	52.6%
Wetland	9.2%	9.2%	12.8%	12.8%
Impervious Cover	21.1%			

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No recent data are available to assess the Aquatic Life Use for Ben Mann Brook.

Billington Sea (MA94007)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	263 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Chlorophyll-a		Added
5	5	Dissolved Oxygen Supersaturation		Added
5	5	(Fanwort*)		Added
5	5	Nutrient/Eutrophication Biological Indicators		Added
5	5	Phosphorus, Total		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting (Alert)

According to DMF biologists (Chase 2016 and 2017) and MMI (2015 and 2017), improvements (dam and/or weir removals, bridge replacements, a fish ladder, and a stream restoration project) have been implemented at all of the impediments to diadromous fish passage along Town Brook up into Billington Sea so there is no impairment for diadromous fish passage. Depth profiles of DO, temperate, saturation, and pH were measured in Billington Sea during the summers of 2008 and 2009 (n=6) by MassDEP and by the Town of Plymouth on 25 September 2014. With the exception of one profile in July 2008, oxygen depletion did not occur, however supersaturated conditions were often encountered (highs ranging between 121 and 131%). The highest saturations occurred during the Town of Plymouth's survey. The pH was also often high during periods of supersaturated conditions indicative of nutrient enriched conditions. Depth integrated chlorophyll a concentrations measured by MassDEP staff were high ranging from 18.9 to 32.6 µg/L and Secchi disk depths were typically fairly low (1.1 to 1.8m) although the June 2008 Secchi disk depth was 2.4m. Total phosphorus concentrations near the surface ranged from 0.016 to 0.043 mg/L with a seasonal average in 2008 of 0.032 mg/L and in 2009 of 0.021 mg/L and were slightly higher near the bottom (0.019 to 0.071 mg/L). MassDEP staff also documented an infestation of the non-native aquatic macrophyte species *Cabomba caroliniana* in Billington Sea in 2008 and noted the possible presence of *Myriophyllum heterophyllum* but this species will need confirmation when flowering heads are present. The Aquatic Life Use is assessed as not supporting for Billington Sea based on the evidence of nutrient enrichment (high chlorophyll a, supersaturated conditions, and elevated total phosphorus concentrations) as well as the infestation of the non-native aquatic macrophyte *Cabomba caroliniana.* The former alert that identified a need to improve fish passage was addressed so it is being removed. A new alert is being added because of the potential infestation of Myriophyllum heterophyllum.

Black Jimmy Pond (MA94008)

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

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed.

Black Mountain Pond (MA94009)

Location:	Marshfield.
AU Type:	FRESHWATER LAKE
AU Size:	17 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Supporting
Dense cover of the non-native aquatic species, *Myriophyllum heterophyllum*, was noted during the 1996 DWM synoptic survey so the Aquatic Life Use is not supporting for Black Mountain Pond.

Bloody Pond (MA94015)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	101 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Fully Supporting
Evaluation of the Town of Plymouth's deep hole depth profile data collected in Bloody Pond during the summers of 2014, 2015, and 2017 documented only one year with slight oxygen depletion at 10m depth (DO minimum 3.6mg/L during 15 September 2015 profile). Oxygen was slightly less than the 5.0 mg/L criterion for an estimated 8% of the lake's surface area at this time. Total phosphorus and chlorophyll a data were collected during surveys in September 2014 and September 2017. Total phosphorus concentrations were higher at depth (near bottom) but were below 0.025 mg/L. Chlorophyll a concentrations were also low (all less than 10 µg/L) during these surveys. Secchi disk depths were all very good although there was a decrease noted over time (September 2014 was 8.9m, September 2015 was 5.1m, and August 2017 was 4.7m). Based on these data, Bloody Pond is assessed as fully supporting the Aquatic Life Use.

Bluefish River (MA94-30)

Location:	Saltmarsh north of Harrison Street, Duxbury to mouth at Duxbury Bay, Duxbury.
AU Type:	ESTUARY
AU Size:	0.07 SQUARE MILES
Classification/Qualifier:	SA: SFO

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for the Bluefish River AU MA94-30.

Boot Pond (MA94016)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	69 ACRES
Classification/Qualifier:	A: PWS, ORW (Tributary)

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	5	Dissolved Oxygen		Added

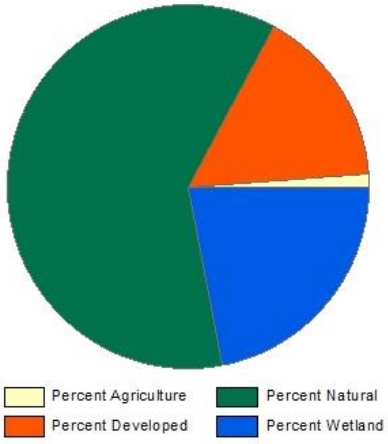
Fish, other Aquatic Life and Wildlife Use: Not Supporting
Evaluation of the Town of Plymouth's deep hole depth profile data collected in Boot Pond during the summers of 2014, 2015, and 2017 documented all three years with oxygen depletion at depths greater than 7 to 8m. Dissolved oxygen was below the 5.0 mg/L criterion somewhere between 13 and 39% of the lake's surface area. Total phosphorus concentrations collected during the September 2015 and July and August 2017 surveys were high at depth (near bottom) (max 0.14mg/L) indicative of nutrient release from anoxic sediment whereas the other water column total phosphorus concentrations were much lower (range 0.01 to 0.04 mg/L). Chlorophyll a concentrations in the upper 8m ranged from 1.1 to 12.93µg/L. Secchi disk depths were variable ranging from 1.8 to 9.5m and the lowest depths did correspond to the higher chlorophyll a concentrations. The Aquatic Life Use for Boot Pond is assessed as not supporting because of the oxygen depletion at depth comprising more than 10% of the lake surface area.

Bound Brook (MA94-18)

Location:	Headwaters, flow control structure near Beechwood Street, Cohasset to mouth at outlet Hunters Pond (confluence with The Gulf), Scituate.
AU Type:	RIVER
AU Size:	2.1 MILES
Classification/Qualifier:	B

Bound Brook - MA94-18

Watershed Area: 11.42 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	11.25	7.64	2.22	1.74
Agriculture	1.1%	0.4%	0.4%	0.5%
Developed	16.1%	18.2%	15.9%	17.8%
Natural	60.9%	61.3%	48.3%	48%
Wetland	22%	20%	35.3%	33.7%
Impervious Cover	5.8%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Fish Passage Barrier*)		Removed

Fish, other Aquatic Life and Wildlife Use: Fully Supporting
Based on the two fish samples collected along Bound Brook in July 2003 which both contained some intolerant/moderately tolerant fishes, and the habitat improvements occurring in this system (i.e., Hunters Pond dam removal, Beechwood Street culvert replacement), the Aquatic Life Use is assessed as fully supporting.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Fish Passage Barrier	Applicable WQS attained, due to restoration activities	The Hunters Pond Dam in Scituate and Cohasset, Massachusetts was removed between July and September 2017. The spillway was notched to ensure a gradual release of water from the impoundment, letting Bound Brook flow free again after being dammed for centuries. As the first barrier upstream from the Atlantic Ocean, the dam's removal restores 5-miles of river

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
		spawning ground and habitat for alewife, blueback herring, American eel, rainbow smelt, sea lamprey and other important species. The project was funded by grants from the Massachusetts Department of Ecological Restoration and the NOAA and included many other project partners including the Town of Scituate, Princeton Hydro, T Ford Company, and the U.S. Fish and Wildlife Service (http://scituate.wickedlocal.com/news/20170901/hunters-pond-dam-dam-removal-paves-way-for-improvements and http://www.princetonhydro.com/blog/dam-removal/..

Supporting Information for Delisted Impairments

Fish Passage Barrier

The Hunters Pond Dam in Scituate and Cohasset, Massachusetts was removed between July and September 2017. The spillway was notched to ensure a gradual release of water from the impoundment, letting Bound Brook flow free again after being dammed for centuries. As the first barrier upstream from the Atlantic Ocean, the dam's removal restores 5-miles of river spawning ground and habitat for alewife, blueback herring, American eel, rainbow smelt, sea lamprey and other important species. The project was funded by grants from the Massachusetts Department of Ecological Restoration and the NOAA and included many other project partners including the Town of Scituate, Princeton Hydro, T Ford Company, and the U.S. Fish and Wildlife Service (http://scituate.wickedlocal.com/news/20170901/hunters-pond-dam-dam-removal-paves-way-for-improvements and http://www.princetonhydro.com/blog/dam-removal/.)

Bound Brook Pond (MA94017)

Location:	Norwell.
AU Type:	FRESHWATER LAKE
AU Size:	21 ACRES
Classification/Qualifier:	A: PWS, ORW (Tributary)

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use of Bound Brook Pond.

Briggs Reservoir (MA94019)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	24 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added
4c	4c	(Non-Native Aquatic Plants*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Aquatic Life Use is assessed as not supporting based on the presence of the non-native aquatic macrophyte *Cabomba caroliniana.*

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte Fanwort (Cabomba caroliniana).

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

The non-native aquatic species, *Cabomba caroliniana*, was noted during the 1996 DWM synoptic survey (MassDEP 1996). The impairment was changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte Fanwort (*Cabomba caroliniana*).

Briggs Reservoir (MA94020)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	17 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added
4c	4c	(Non-Native Aquatic Plants*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Aquatic Life Use is assessed as not supporting for Briggs Reservoir based on the presence of the non-native aquatic macrophyte *Cabomba caroliniana.*

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte Fanwort (Cabomba caroliniana).

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

The non-native aquatic species *Cabomba caroliniana* was documented during the 1996 synoptic survey (MassDEP 1996). The impairment was changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte Fanwort (*Cabomba caroliniana*).

Cohasset Cove (MA94-32)

Location:	The waters south of a line drawn from the Bassing Beach jetty, Scituate westerly to the opposite shore, Cohasset excluding Baileys Creek and The Gulf.
AU Type:	ESTUARY
AU Size:	0.09 SQUARE MILES
Classification/Qualifier:	SA: SFO

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)
An extremely small area of eelgrass bed habitat was mapped during the 1995 survey at the very outer edge of the Cohasset Cove AU. The majority of this bed area was mapped in adjacent Cohasset Harbor AU and this particular bed area has been receding steadily between 1995 and 2017 (MassDEP UndatedA). It should be noted however that eelgrass bed habitat was not documented in almost any of the Cohasset Cove AU area and is therefore not considered to be the best indicator for evaluating the Aquatic Life Use status for the cove. Survival of both *A. bahia* and *M. beryllina* exposed (48 hours) to water collected from Cohasset Cove off the Margin Street dock has ranged from 70 to 100% and has been >75% in all but one of 32 test events conducted between January 2010 and October 2017. Additionally, between December 2004 and October 2017, 49 valid acute WET tests were conducted on the Cohasset WWTP effluent using the test organism *A. bahia* and 47 valid acute WET tests were conducted using the test organism *M. beryllina.* With the exception of one *A. bahia* test (May 2005 with LC_{50}=41.9% effluent) the LC_{50}'s were all $\geq$100% effluent for both species (MassDEP undated). The Aquatic Life Use is assessed as fully supporting but is identified with an Alert Status because of the eelgrass bed area at the very outer edge of the cove that has receded.

Cohasset Harbor (MA94-01)

Location:	The waters south of a line drawn from the northwestern point of Scituate Neck, Scituate to just north of Quarry Point, Cohasset not including Cohasset Cove, Cohasset/Scituate.
AU Type:	ESTUARY
AU Size:	0.7 SQUARE MILES
Classification/Qualifier:	SA: SFO

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)
The Aquatic Life Use is assessed as fully supporting for Cohasset Harbor based on MassDEP eelgrass mapping during the 1995 and 2015-2017 sampling periods. An estimated 0.128 square miles of eelgrass coverage was mapped in 2015-2017 which is more the eelgrass coverage found in 1995 (0.121 square miles). This use is identified with an Alert Status because of steady declines in the eelgrass bed habitat nearest to Cohasset Cove.

Cooks Pond (MA94027)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	21 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting (Alert)
Evaluation of the Town of Plymouth's deep hole depth profile data collected on 17 September 2015 documented good oxygen concentrations to a depth of 1.5m (≥5.7 mg/L) in Cooks Pond. DO was somewhat depleted at the 3.5m depth (2.1mg/L). No bathymetric data are available for Cooks Pond to estimate the lake surface area exhibiting oxygen depletion. Total phosphorus concentrations were slightly elevated (0.028 to 0.031mg/L) and slightly above the recommended guideline of 0.025 mg/L, however chlorophyll a concentrations were low (<3.92 µg/L). Secchi disk depth was okay (1.5m). Because of the presence of the non-native aquatic species *Cabomba caroliniana* and *Utricularia inflata* in Cooks Pond the Aquatic Life Use is assessed as not supporting. An Alert Status is being identified because of low DO below 1.5m and slightly elevated total phosphorus concentrations.

Crossman Pond (MA94032)

Location:	Kingston.
AU Type:	FRESHWATER LAKE
AU Size:	13 ACRES
Classification/Qualifier:	B

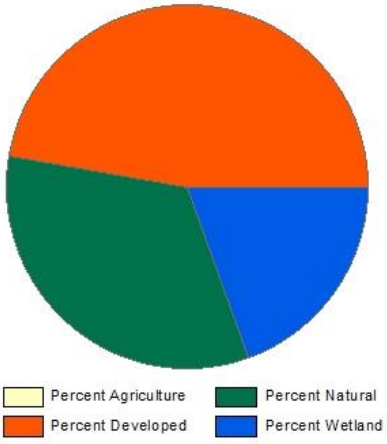
Fish, other Aquatic Life and Wildlife Use: Not Assessed (Alert)
No recent data are available to assess the Aquatic Life Use for Crossman Pond. The Alert Status is being maintained because of the presence of *Myriophyllum* sp., which may be *heterophyllum*, however this will requires further confirmation when flowering heads are present.

CUSHING BROOK (MA94-40)

Location:	Headwaters (perennial portion), east of Pleasant Street, Rockland to mouth at confluence with Drinkwater River, Hanover.
AU Type:	RIVER
AU Size:	3.1 MILES
Classification/Qualifier:	B

Cushing Brook - MA94-40

Watershed Area: 4.08 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	4.08	3.31	1.47	1.21
Agriculture	0.2%	0.2%	0.1%	0.1%
Developed	47.3%	45.9%	30.8%	27.3%
Natural	33.1%	31%	41%	40%
Wetland	19.5%	22.9%	28.2%	32.6%
Impervious Cover	19.8%			

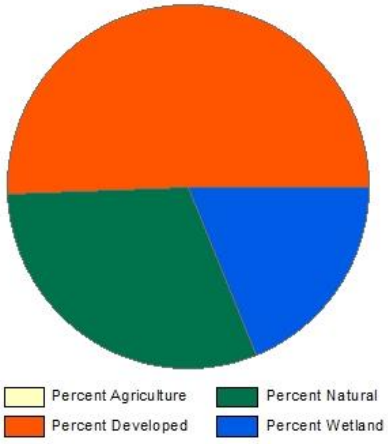
Fish, other Aquatic Life and Wildlife Use: Insufficient Information
Although the fish sample collected in August 2013 contained a moderately tolerant macrohabitat generalist species, too limited data are available to assess the Aquatic Life Use for Cushing Brook.

Drinkwater River (MA94-21)

Location:	From Whiting Street, Hanover to mouth at inlet Factory Pond, Hanover (through former 2014 segment: Forge Pond MA94037).
AU Type:	RIVER
AU Size:	3.5 MILES
Classification/Qualifier:	B: WWF

Drinkwater River - MA94-21

Watershed Area: 20.7 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	20.69	10.75	6.08	3.36
Agriculture	0.9%	1.3%	0.4%	0.6%
Developed	50.2%	43.3%	35.1%	27.5%
Natural	30.2%	31%	34%	31.7%
Wetland	18.7%	24.4%	30.4%	40.3%
Impervious Cover	18.4%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Curly-leaf Pondweed*)		Added
5	5	Dissolved Oxygen		Removed
5	5	(Fanwort*)		Added
5	5	(Non-Native Aquatic Plants*)		Removed
5	5	Nutrient/Eutrophication Biological Indicators		Added
5	5	Trash		Changed

Fish, other Aquatic Life and Wildlife Use: Not Supporting

Instream water quality monitoring was conducted in the Drinkwater River upstream from the confluence with French Stream during the summer of 2006 at one sampling station (W0895) and one benthic macroinvertebrate station (B0595). The RPB III analysis of the benthic sample indicated slightly impacted conditions compared to the control station. The water quality data collected were also indicative of good conditions (i.e., temp, DO, saturation, specific conductivity) while pH was slightly low (ranging from 6.2 to 6.5 SU which was considered natural). Downstream from the confluence with French Stream however, no data were collected in 2006. Prior survey work conducted in the Forge Pond impoundment during the summers of 1996 and 2001 revealed indicators of high productivity including elevated chlorophyll a, total phosphorus, supersaturation of oxygen, as

well as the infestation of two non-native macrophytes, *Potamogeton crispis* and *Cabomba caroliniana.* These causes of impairment will continue to be identified for the Drinkwater River however it should be noted that the major source of total phosphorus is the Rockland WWTP discharge to French Stream. Other sources are unknown.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Dissolved Oxygen	Applicable WQS attained; original basis for listing was incorrect	The DO concentrations in the Drinkwater River and the Forge Pond impoundment collected as part of the 2001 survey were all >5.0 mg/L. The problem was not DO concentration but was supersaturation (as high as 161%). Therefore this cause code is being delisted and Dissolved Oxygen Supersaturation has been added.
Non-Native Aquatic Plants	Clarification of listing cause	The generic "Non-Native Aquatic Plants" is not needed since the specific macrophytes "Curly-leaf pondweed (Potamogeton crispus) and Fanwort (Cabomba caroliniana) have been utilized.

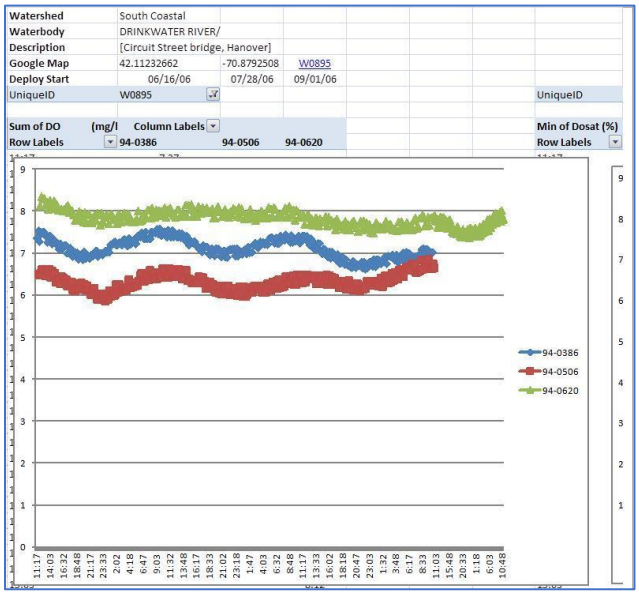
Supporting Information for Delisted Impairments

Dissolved Oxygen

MassDEP staff deployed probes in the Drinkwater River at Circuit Street bridge, Hanover (W0895) during the summer of 2006 MassDEP (UndatedC):

UniqueID	Waterbody	AU_Class	Qualifier	Start.Date	Days	OWMID.Minimum.DO	Daily Mean Minimum DO	Maximum Daily DO Shift	OWMID Mean DO	OWMID Maximum Saturation
W0895	DRINKWATER RIVER	B	WWF	06/16/06	3	6.63	6.74	0.82	7.13	79.3
W0895	DRINKWATER RIVER	B	WWF	07/28/06	3	5.87	6.02	0.77	6.33	78.3
W0895	DRINKWATER RIVER	B	WWF	09/01/06	4	7.37	7.50	0.64	7.81	85.0

DO probe deployment graph Drinkwater River at Circuit Street bridge, Hanover (W0895) (MassDEP UndatedA):



DO probe deployment summary Drinkwater River at Circuit Street bridge, Hanover (W0895) (MassDEP UndatedA):

Unique ID	Gear Type	Project Name	OWMIDs Used to Build File	
W0895	Data Sonde	South Coastal (2006)	94-0386, 94-0506, 94-0620	
Station ID	**Station Description**	**Mile Point**	**Latitude (dec-degrees)**	**Longitude (dec-degrees)**
DW101	[Circuit Street bridge, Hanover]	1.3	42.11232662	-70.87925085
Watershed	**SARIS_PALIS_CAMIS**	**Water Body**		
South Coastal	9456900	DRINKWATER RIVER/		

Station File Start Time	6/16/2006 11:17 AM
Station File End Time	9/5/2006 11:18 AM
Total Station File Duration (Hours)	1944.0
Total Station File Count	7777

	Analytes		
	Temperature (Celsius)	**DO (mg/L)**	**DOsat (%)**
Observed Deployment Time (Hours)	237.0	237.0	237.0
Observed Count	951	951	951
Avg*	18.6	7.2	77
SD*	2.6	0.6	3
Min*	15.3	5.9	69
Max*	23.8	8.4	85
Median*	17.6	7.3	77
IQR*	4.8	1.2	5
Mean of the Daily Mean*	18.6	7.2	[redacted]
Mean of the Daily Min*	17.7	6.9	[redacted]
Mean of the Daily Max*	19.6	7.5	[redacted]
MWAT*	--	[redacted]	[redacted]
Amount of Time > 20 deg. C (Hours)	71.2	[redacted]	[redacted]
Max Duration > 20 deg. C (Hours)	66.4	[redacted]	[redacted]
Avg Daily Amount of Time > 20 deg. C (H	7.4	[redacted]	[redacted]
Amount of Time > 28.3 deg. C (Hours)	0.0	[redacted]	[redacted]
Max Duration > 28.3 deg. C (Hours)	0.0	[redacted]	[redacted]
Avg Daily Amount of Time > 28.3 deg. C (	0.0	[redacted]	[redacted]
Amount of Time > 29.4 deg. C (Hours)	0.0	[redacted]	[redacted]
Max Duration > 29.4 deg. C (Hours)	0.0	[redacted]	[redacted]
Avg Daily Amount of Time > 29.4 deg. C (	0.0	[redacted]	[redacted]
Amount of Time < 3.0 mg/L (Hours)	[redacted]	0.0	[redacted]
Max Duration < 3.0 mg/L (Hours)	[redacted]	0.0	[redacted]
Avg Daily Amount of Time < 3.0 mg/L (Ho	[redacted]	0.0	[redacted]
Amount of Time < 4.0 mg/L (Hours)	[redacted]	0.0	[redacted]
Max Duration < 4.0 mg/L (Hours)	[redacted]	0.0	[redacted]
Avg Daily Amount of Time < 4.0 mg/L (Ho	[redacted]	0.0	[redacted]
Amount of Time < 5.0 mg/L (Hours)	[redacted]	0.0	[redacted]
Max Duration < 5.0 mg/L (Hours)	[redacted]	0.0	[redacted]
Avg Daily Amount of Time < 5.0 mg/L (Ho	[redacted]	0.0	[redacted]
Amount of Time < 6.0 mg/L (Hours)	[redacted]	1.6	[redacted]
Max Duration < 6.0 mg/L (Hours)	[redacted]	0.6	[redacted]
Avg Daily Amount of Time < 6.0 mg/L (Ho	[redacted]	0.1	[redacted]

MassDEP (UndatedC): Attended probes measurements were conducted at Drinkwater River at Circuit Street bridge, Hanover (W0895) during the summer 2006. Dissolved oxygen readings were obtained on 11 occasions with one measurement < 5mg/L.

attended data

Waterbody	UNIQUE_ID	DESCRIPTOR	DATE	TIME	DO	DOSAT	ResComm
Drinkwater Rive	W0895	[Circuit Street bridge, Hanover]	6/21/2006	11:28:36 AM	7.3	78	
Drinkwater Rive	W0895	[Circuit Street bridge, Hanover]	6/16/2006	11:03:01 AM	7.2	72	
Drinkwater Rive	W0895	[Circuit Street bridge, Hanover]	6/19/2006	10:46:33 AM	7.1	77	
Drinkwater Rive	W0895	[Circuit Street bridge, Hanover]	7/6/2006	11:31:01 AM	5.9	64	
Drinkwater Rive	W0895	[Circuit Street bridge, Hanover]	7/28/2006	11:53:04 AM	6.3	73	
Drinkwater Rive	W0895	[Circuit Street bridge, Hanover]	7/31/2006	10:50:33 AM	6.4	72	
Drinkwater Rive	W0895	[Circuit Street bridge, Hanover]	8/2/2006	11:30:33 AM	4.4	52	
Drinkwater Rive	W0895	[Circuit Street bridge, Hanover]	9/6/2006	11:30:36 AM	6.8	72	
Drinkwater Rive	W0895	[Circuit Street bridge, Hanover]	9/1/2006	12:11:34 PM	8.1	83	
Drinkwater Rive	W0895	[Circuit Street bridge, Hanover]	9/5/2006	11:20:37 AM	7.8	80	
Drinkwater Rive	W0895	[Circuit Street bridge, Hanover]	10/11/2006	11:27:00 AM	6.8	65	

Attended Data				
UniqueID	Waterbody	Count DO	Count DO CWF <5.0	DOSAT max
W0895	DRINKWATER RIVER	11	1	83

MassDEP profile data collected during the summer at the deep hole in the Forge Pond impoundment of the Drinkwater River, Hanover (W0954) 2001 MassDEP (2006):

Table C2. 2001 DWM South Coastal River Watershed Baseline Lakes *in-situ* Hydrolab® data

Forge Pond/Drinkwater River (Palis: 94037) (Saris: 9456900)
Unique_ID: W0954 Station: A, Mile Point: 0.6
Description: Deep hole, southeast quadrant of pond, Hanover

Date	OWMID	Time	Depth	Temp	pH	Cond @ 25°C	TDS	SAL	DO	SAT
		(24hr)	(m)	(C)	(SU)	(uS/cm)	(mg/l)	(ppt)	(mg/l)	(%)
07/03/2001	LB-1808	09:40	1.0	18.3u	6.2	289	185	--	5.8	60
		09:47	2.0	17.0	6.2	291	186	--	6.5	66
08/02/2001	LB-1828	12:32	0.4	25.2u	9.1cu	540	346	--	13.6	161
		13:02	1.3	21.2	7.6cu	546	350	--	9.7u	106u
09/05/2001	LB-1848	10:31	0.5	20.3u	7.0c	449	287	--	9.6	105
		10:37	1.3	20.3u	7.0c	450	288	--	9.5	104
	LB-1852	10:45	0.5	20.4	7.1c	448	287	--	9.9	107
		10:51	1.3	20.3	7.1cu	450	288	--	9.9u	107u

Non-Native Aquatic Plants

Two non-native aquatic macrophyte species, *Potamogeton crispis* and *Cabomba caroliniana*, were observed in the Forge Pond impoundment by DWM during the 1996 synoptic survey (MassDEP 1996). The generic "Non-Native Aquatic Plants" impairment is not needed since the specific macrophytes "Curly-leaf pondweed (*Potamogeton crispus*) and Fanwort (*Cabomba caroliniana*) impairments have been utilized.

Duxbury Bay (MA94-15)

Location:	The waters north and west of a line from Saquish Head to the tip of Plymouth Beach and from there to High Cliff (includes Kingston Bay), Plymouth excluding Back River and Bluefish River, Duxbury and Jones River, Kingston.
AU Type:	ESTUARY
AU Size:	12.7 SQUARE MILES
Classification/Qualifier:	SA: SFO

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	5	Estuarine Bioassessments		Added

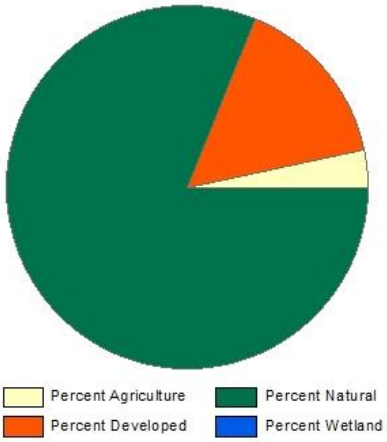
Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Aquatic Life Use for Duxbury Bay is assessed as not supporting based on the eelgrass bed habitat loss (~25% loss between 1995 and 2013 and ~ 66% loss between 1995 and 2017).

EEL RIVER (MA94-37)

Location:	Headwaters (restored), southeast of College Pond Road, Plymouth to inlet Russell Millpond, Plymouth (formerly part of 2014 segment: Eel River MA94-23).
AU Type:	RIVER
AU Size:	1.1 MILES
Classification/Qualifier:	B

Eel River - MA94-37

Watershed Area: 3.84 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.83	3.83	0.55	0.55
Agriculture	3.3%	3.3%	20.8%	20.8%
Developed	15.5%	15.5%	8.5%	8.5%
Natural	80.5%	80.5%	68.5%	68.5%
Wetland	0.6%	0.6%	2.2%	2.2%
Impervious Cover	6.4%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	2	(Fish Passage Barrier*)		Removed
4c	2	(Non-Native Aquatic Plants*)		Removed

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

A coordinated series of restoration actions were undertaken to address stressors limiting ecological potential as part of the Eel River Headwaters Restoration Project (MA DER, 2018). The stressors included barriers to fish and wildlife passage, altered hydrology and degraded wetland soils (buried under a century of farm-applied sand), and simplified channel and floodplain structure. Specific actions included: Removal of the Sawmill Pond Dam (a complete barrier to upstream fish migration) completed in 2010; replacement of two undersized culverts and removal of a third; removal of seven water control structures (essentially small dams); re-construction of 1.7 miles of stream channel and floodplain; installation of 1,000+ pieces of large wood, removal of 48,000 cubic yards of fill, and installation of approximately 20,000 plants, including 17,000+ Atlantic white cedar trees. Since the Sawmill Pond Dam barrier has been removed (Chase 2018b), there is no impairment for diadromous fish passage for the Eel River. Backpack electrofishing was conducted at 13 locations along the Eel River between September 2005 and August 2011. Multiple age classes of eastern brook trout as well as white sucker and American eel, among other species, were documented in more than half of the samples. Near the downstream end of this AU the RBPIII analysis of the benthic macroinvertebrate sample (station B0588) collected in July 2006

by MassDEP biologists was found to be 60% comparable, "slightly impacted", when compared to the reference stream on the unnamed tributary upstream from Forge Pond in Plymouth. The water quality data collected between June and September 2006 (W0338) are not considered representative of current conditions since they were collected prior to the major restoration projects. There is no record of non-native aquatic macrophytes in this portion of the Eel River (the infestations were in impoundments of the Eel River downstream from Russell Mill Pond) so the non-native aquatic plant impairment is being removed.
The Aquatic Life Use for this Eel River AU (MA94-37) is assessed as fully supporting based primarily on the lack of any barriers to fish passage, as well as the evidence of reproducing eastern brook trout indicative of excellent habitat and water quality conditions.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Fish Passage Barrier	Applicable WQS attained, due to restoration activities	The Sawmill Dam was removed in 2010 as part of the Eel River Headwaters Restoration Project – winner of the 2011 Coastal America Partnership Award. 60 acres of former commercial cranberry farm transformed into self-sustaining freshwater wetlands including reconstruction of ~1.7 miles of stream channel and floodplain.
Non-Native Aquatic Plants	Applicable WQS attained; original basis for listing was incorrect	This segment of the Eel River has no record of any non-native aquatic macrophytes. The infestation had been documented further downstream in the Hayden Pond and Eel River Pond impoundments.

Supporting Information for Delisted Impairments

Fish Passage Barrier

Diadromous Fish Habitat: A coordinated series of restoration actions were undertaken to address stressors limiting ecological potential as part of the Eel River Headwaters Restoration Project (MA DER, 2018). The stressors included barriers to fish and wildlife passage, altered hydrology and degraded wetland soils (buried under a century of farm-applied sand), and simplified channel and floodplain structure. Specific actions included:

- Removal of the Sawmill Pond Dam (a complete barrier to upstream fish migration) which was completed in 2010;
- replacement of two undersized culverts and removal of a third; removal of seven water control structures (essentially small dams);
- re-construction of 1.7 miles of stream channel and floodplain;
- installation of 1,000+ pieces of large wood, removal of 48,000 cubic yards of fill, and installation of approximately 20,000 plants, including 17,000+ Atlantic white cedar trees.

Since the Sawmill Pond Dam barrier has been removed (Chase 2018b), there is no impairment for diadromous fish passage for the Eel River (Assessment Unit MA94-37).

Non-Native Aquatic Plants

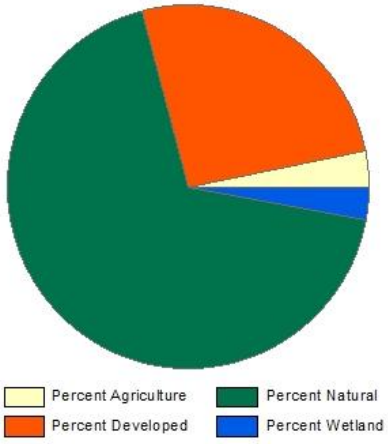
This segment of the Eel River has no record of any non-native aquatic macrophytes so this impairment error is being corrected.

EEL RIVER (MA94-38)

Location:	From outlet Russell Millpond, Plymouth to mouth at Plymouth Harbor, Plymouth (formerly part of 2014 segment: Eel River MA94-23).
AU Type:	RIVER
AU Size:	2.7 MILES
Classification/Qualifier:	B

Eel River - MA94-38

Watershed Area: 19.99 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	16.79	10.14	1.83	1.34
Agriculture	3.2%	4.3%	11.7%	9.8%
Developed	25.9%	24.9%	15.4%	17.6%
Natural	67.9%	66.2%	54.2%	49.1%
Wetland	3%	4.6%	18.7%	23.5%
Impervious Cover	11.4%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	5	Benthic Macroinvertebrates		Added
4c	5	(Fanwort*)		Added
4c	5	(Fish Passage Barrier*)		Removed
4c	5	(Non-Native Aquatic Plants*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting

According to DMF biologists (Chase 2016 and 2017), the fishway at the Hayden Mill Pond Dam in Plymouth allow adequate passage of river herring and American eel (passage score = 1 - a minor obstruction). A fish ladder was constructed at the Russel Mill Pond Dam in Plymouth in 2007 (FERC permit) and is operated under a fishway permit (2008) and an Operation and Maintenance Plan (2010). Therefore, there is no longer impairment for diadromous fish passage for this Eel River AU. Water quality monitoring in the Eel River at Russell Mills Road in Plymouth (W0339) during the summer of 2006 documented generally good water quality conditions. The minimum DO was 7.5 mg/L, the maximum temperature was 26.1°C, pH was good, and the total phosphorus concentrations were fairly low (average 0.037 and maximum 0.07 mg/L). Although there were no indications of nutrient enrichment (no observations of dense or very dense filamentous algae noted at the sampling station, maximum diel change 0.8 mg/L DO, maximum saturation 107%), the RBP III analysis of the benthic macroinvertebrate sample that was collected approximately 100 meters downstream from Russell Mills Road in Plymouth (B0589) in July 2006, was “moderately impacted” when compared to the unnamed tributary

to the Eel River reference (B0590). The sample was dominated by (55%) by *Hydropsyche betteni,* a filtering collector, and the sample had the highest HBI of any of the benthic sites (not surprising considering the location of this sampling station just downstream from Russell Millpond). Fish sampling near this location (Sample ID: 2002) in September 2006 documented 10 species. The sample was comprised of small (but a single age class) eastern brook trout as well as brown trout and a rainbow trout which were large and assumed to be stocked, but the sample was dominated by tolerant/moderately tolerant macrohabitat generalist species. The non-native aquatic macrophyte species *Cabomba caroliniana* in the Hayden and Eel River Pond impoundments in this Eel River AU continue to be identified as impairments. The Aquatic Life Use for this Eel River AU (MA94-28) is assessed as not supporting based on the *Cabomba caroliniana* infestation and the moderately impacted benthic community.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Fish Passage Barrier	Applicable WQS attained, due to restoration activities	The fish ladder constructed at the Russell Millpond Dam in Plymouth in 2007 (FERC permit), operated under a fishway permit (2008), and an Operation and Maintenance Plan (2010), has improved diadromous fish habitat in this subwatershed area up into Russell Millpond.
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte Fanwort (Cabomba caroliniana).

Supporting Information for Delisted Impairments

Fish Passage Barrier

"Diadromous Fish Habitat: According to DMF biologists (Chase 2016 and 2017), the fishway at the Hayden Mill Pond Dam in Plymouth allow adequate passage of river herring and American eel (passage score = 1 - a minor obstruction). A fish ladder was constructed at the Russel Mill Pond Dam in Plymouth in 2007 (FERC permit) and is operated under a fishway permit (2008) and an Operation and Maintenance Plan (2010). Therefore, there is no longer impairment for diadromous fish passage for the Eel River Assessment Unit MA94-38."

Non-Native Aquatic Plants

Dense to very dense coverage of the non-native aquatic macrophyte species *Cabomba caroliniana* was documented in the Hayden and Eel River Pond impoundments along this segment of the Eel River (Mercer and Monnelly 2000). The impairment was changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte Fanwort (*Cabomba caroliniana*).

Elbow Pond (MA94035)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	21 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed.

Ellisville Harbor (MA94-34)

Location:	east of Ellisville Road, Plymouth.
AU Type:	ESTUARY
AU Size:	0.01 SQUARE MILES
Classification/Qualifier:	SA: SFO

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed.

Factory Pond (MA94175)

Location:	Hanson/Hanover.
AU Type:	FRESHWATER LAKE
AU Size:	51 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Fish Passage Barrier*)		Added

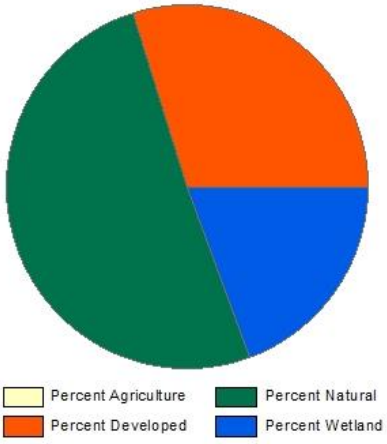
Fish, other Aquatic Life and Wildlife Use: Not Supporting
According to DMF biologists there are two barriers along Indian Head River in Hanover/Hanson that do not allow passage of river herring, American eel, and/or American shad into Factory Pond: the State Street Dam (passage score of 8- severe impediment) and the Factory Pond Dam (passage score of 10—no possible passage). Based on these obstructions, the Aquatic Life Use is assessed as impaired for Factory Pond (Assessment Unit MA94175). It should also be noted that cleanup activities continue at the Former National Fireworks Site (the Fireworks Site or the Site) in Hanover and Hanson.

FIRST HERRING BROOK (MA94-36)

Location:	Headwaters, in South Swamp, Norwell to inlet Tack Factory Pond, Scituate (formerly part of 2014 segment: First Herring Brook MA94-25).
AU Type:	RIVER
AU Size:	2.6 MILES
Classification/Qualifier:	A: PWS, ORW (Tributary)

First Herring Brook - MA94-36

Watershed Area: 2.92 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.92	2.92	0.97	0.97
Agriculture	1%	1%	0%	0%
Developed	29.5%	29.5%	17.9%	17.9%
Natural	50.3%	50.3%	49.7%	49.7%
Wetland	19.2%	19.2%	32.4%	32.4%
Impervious Cover	8.5%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	4c	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting (Alert)

The 2006 benthic macroinvertebrate community sample from First Herring Brook (Station B0600) was found to be only "slightly impacted" compared to the reference station condition. Water quality sampling was on conducted at one station (W1510) on 5 occasions during the 2006 sampling season. Total phosphorus concentrations were elevated (average 0.13 mg/L, maximum 0.37 mg/L), however there were no observations of dense or very dense filamentous algae, or any other indicators of nutrient enriched conditions (the maximum daily DO shift was 0.8 mg/L, and the maximum DO saturation was 74%). Similar to conditions found in 2001, pH was low. DO was above standards at all times during three of the four deployments and was only slightly low during the late July 2006 deployment (min 4.5 and mean DO 4.7 mg/L).

According to DMF biologists (Chase 2016 and 2017), the existing fishway at Reservoir Dam in Scituate which should allow passage of river herring and American eel has a passage rating of 9 (a severe impediment). Therefore, fish passage barrier will be added as an impairment for the First Herring Brook Assessment Unit MA94-36 upstream from the Reservoir Dam. Former alert was based on the influence of groundwater withdrawals on streamflow and the Scituate DPW Water Division's practices related to flow manipulation at the reservoir just downstream from Tack Factory Pond to Old Oaken Bucket Pond which is no

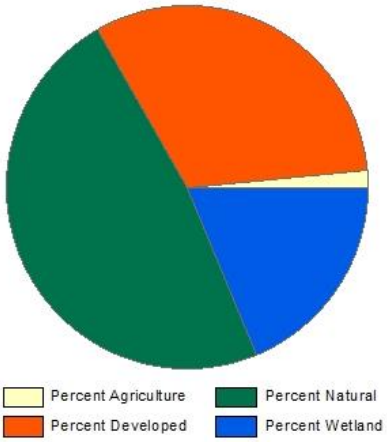
longer part of this AU so this alert is being removed, however a new alert because of the elevated total phosphorus is being added.

FIRST HERRING BROOK (MA94-63)

Location:	Outlet of unnamed pond (locally called 'Reservoir') to mouth at inlet of Old Oaken Bucket Pond, Scituate (formerly part of 2014 segment: First Herring Brook MA94-25).
AU Type:	RIVER
AU Size:	0.5 MILES
Classification/Qualifier:	A: PWS, ORW (Tributary)

FIRST HERRING BROOK - MA94-63

Watershed Area: 3.75 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.75	3.54	1.35	1.24
Agriculture	1.5%	1.6%	0.8%	0.8%
Developed	31.7%	31.7%	20.1%	19.2%
Natural	48%	49.1%	47.6%	49.1%
Wetland	18.7%	17.6%	31.6%	30.8%
Impervious Cover	9%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	4c	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting (Alert)

According to DMF biologists (Chase 2016 and 2017), the existing fishway at Reservoir Dam in Scituate which should allow passage of river herring and American eel has a passage rating of 9 (a severe impediment). Therefore, fish passage barrier will be added as an impairment for diadromous fish passage for the First herring Brook Assessment Unit MA94-63 and the assessment units upstream from the Reservoir Dam. It should be noted however that (NSRWA undated) Since 2007 the town of Scituate, which receives ~80% of its municipal water supply from the First Herring Brook watershed, has worked to create a multi-pronged approach to balancing municipal water demand and ecological flow needs with the end goal of restoring more natural conditions and providing adequate flow for herring migration. According to the North & South Rivers Watershed Association, the First Herring Brook Restoration Project began with a modeling effort in 2007. In 2011 implementation efforts included summer irrigation restrictions and release of streamflow as part of a water division operational plan and in 2012 some herring migration was documented into Old Oaken Bucket Pond (small numbers of fish each spring after decades of no herring at all). Additionally, improvements at the Old Oaken Bucket fish ladders (weir adjustments in 2013) and preliminary design improvements to the Reservoir dam and fish ladder (2013 and 2014) were funded by two MassDEP Sustainable Water Management

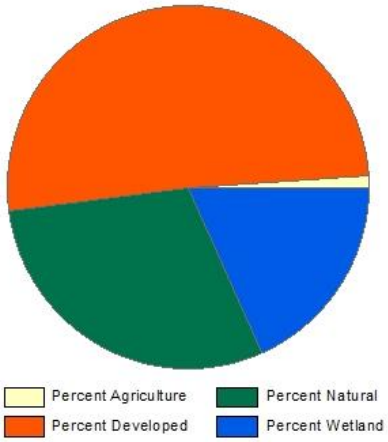
Initiative (SWMI) grants. The former alert was based on the influence of groundwater withdrawals on streamflow and the Scituate DPW Water Division's practices related to flow manipulation at the reservoir just downstream from Tack Factory Pond to Old Oaken Bucket Pond so this alert is being maintained.

French Stream (MA94-03)

Location:	Headwaters on the southeast side of the South Weymouth Naval Air Station, Rockland to mouth at confluence with Drinkwater River, Hanover (excluding the approximately 0.3 mile through Studleys Pond).
AU Type:	RIVER
AU Size:	5.8 MILES
Classification/Qualifier:	B: WWF

French Stream - MA94-03

Watershed Area: 8.94 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	8.93	6.22	2.55	1.8
Agriculture	1%	1.4%	0.2%	0.3%
Developed	51.1%	47.1%	37.5%	37.1%
Natural	29.6%	31.2%	31.7%	28.5%
Wetland	18.3%	20.3%	30.5%	34.1%
Impervious Cover	19%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Whole Effluent Toxicity (WET)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting (Alert)

Instream water quality monitoring was conducted during the summer of 2006 at two sampling stations (W0898 and W0897) in French Stream bracketing the Rockland WWTP discharge and benthic macroinvertebrate sampling was conducted upstream from the discharge. The RPB III analysis of the benthic sample indicated slightly impacted conditions compared to the control station. Survival of C. dubia exposed to French Stream samples collected at Summer Street has also been >80% in all but two of the 53 tests (96% of the tests) conducted between September 2004 and October 2017 but was <75% in 2 tests (July 2006 and January 2007 when C. dubia survival was 0 and 70%, respectively). With the exception of total phosphorus concentrations in the river downstream from the discharge (average 0.16 mg/L, maximum 0.21 mg/L), all other data collected were indicative of good conditions (temp, DO, saturation, pH, specific conductivity). While there were no observations of enriched conditions (e.g., observations of dense or very dense filamentous algae, diel changes in DO exceeding guidance), the Aquatic Life Use for French Stream is assessed as not supporting based on the elevated concentration of total phosphorus result from the Rockland WWTP discharge. The fish bioassessment impairment is being carried forward since no new fish data have been collected. The dissolved oxygen impairment is also being carried forward until more recent data are collected that confirm the appropriateness

of its delisting. It should also be noted that the Rockland WWTP discharge has exhibited an improvement in effluent quality in terms of whole effluent toxicity however as there have been no violation of the LC50 limit nor the CNOEC limit since the January 2012 test event. When Rockland WWTP conducted WET tests using *P. promelas* (prior to June 2000), survival of this test species exposed to French Stream water collected at Summer Street Bridge was frequently (~61% of the time tested) less than 75% so this former alert issue is being carried forward.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Whole Effluent Toxicity (WET)	Applicable WQS attained; reason for recovery unspecified	A total of 22 whole effluent toxicity tests were conducted on the Rockland WWTP effluent (Outfall #001) between September 1999 and June 2004 using C.dubia. The LC50s ranged from 36.6 to 100% effluent. Acute toxicity was detected in six tests of the 22 tests with LC50s ranging from 36.6 to 73.6% effluent. Of the 18 valid chronic tests, the C-NOECs ranged from 12.5 to 100% effluent and 10 of the tests (including the six acutely toxic events) had C-NOEC results <88% effluent. Since then however, between September 2004 and October 2017, 54 valid acute and 50 valid chronic WET tests have been conducted. The LC50s were >100% effluent in all 54 acute tests. The CNOEC results ranged from <6.25 to 100% effluent. While the CNOEC permit limit was not met in 15 of the 50 valid chronic tests (~30% of the tests), all tests conducted since January 2012 have met the CNOEC permit limit. Given these improvements the WET impairment is being delisted.

Supporting Information for Delisted Impairments

Whole Effluent Toxicity (WET)

PERMITTEE	NPDES #	SEGMENT
TOWN OF ROCKLAND BOARD OF SEWER COMMISSIONERS, ROCKLAND WWTP	MA0101923	MA94-03

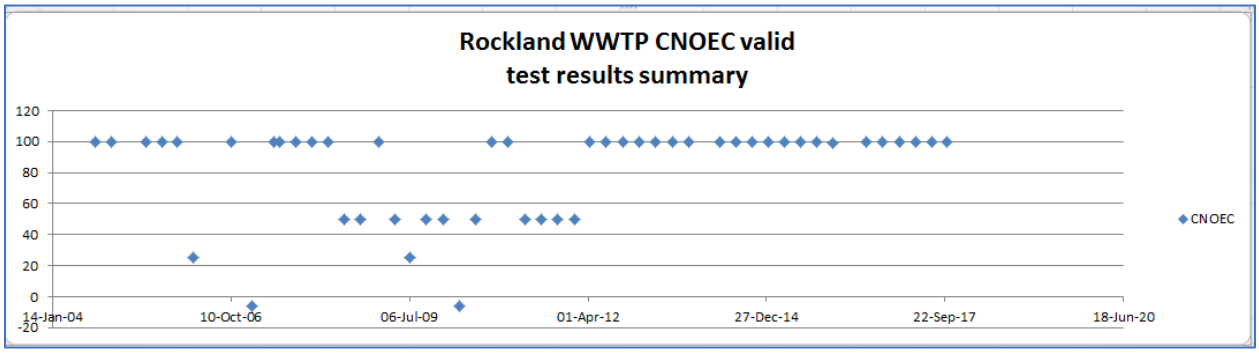
(MassDEP UndatedB):
The Town of Rockland Board of Sewer Commissioners is authorized (MA0101923 issued in January 2006 and modified slightly in February 2007) to discharge a flow of 2.5 MGD (rolling annual average) of treated effluent from the Rockland Wastewater Treatment Plant (WWTP) via Outfall # 001 to the French Stream. The facility's whole effluent toxicity limits are $LC_{50} \geq 100$ and C-NOEC $\geq$ 99% effluent using *Ceriodaphnia dubia*. Toxicity testing for this facility is required four times/year.

Toxicity
Ambient MA94-03
Water from French Stream was collected approximately 0.25 miles upstream from the Rockland WWTP discharge at the Summer Street bridge in Rockland for use as dilution water in the Rockland WWTP's modified acute and chronic WET tests. Survival of *C. dubia* exposed (~7 days) to the river water has been $\geq$80% in 53 tests (96% of the

tests) conducted between September 2004 and October 2017 but was <75% in 2 tests (July 2006 and January 2007 when C. dubia survival was 0 and 70%, respectively) (MassDEP undatedB).

Effluent (discharge to MA94-03)

Between September 2004 and October 2017, 54 valid acute and 50 valid chronic WET tests have been conducted on the Rockland WWTP effluent. The LC50s were >100% effluent in all 54 acute tests. The CNOEC results ranged from <6.25 to 100% effluent. While the CNOEC permit limit was not met in 15 of the 50 valid chronic tests (~30% of the tests), it should be noted that all tests conducted since January 2012 have met the CNOEC permit limit (see graphic below) (MassDEP UndatedB).



Fresh Pond (MA94040)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	60 ACRES
Classification/Qualifier:	B

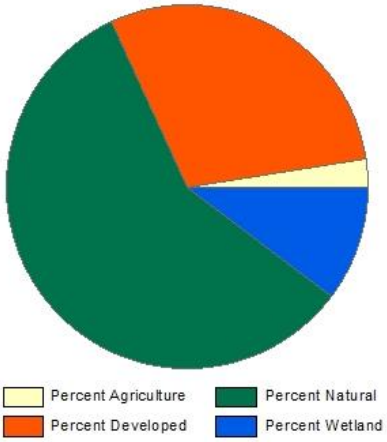
Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)
Oxygen depletion at a depth of 4.5m or greater was documented during each of the three surveys conducted in Fresh Pond: by MassDEP in July 2003 (DO 3.3mg/L at 4.5m) and by the Town of Plymouth volunteers in August 2014 (DO 4.8 mg/L at 7m) and 2015 (DO 4.3 mg/L at 6m). The rough estimate of lake area depleted of oxygen during the July 2003 survey is ~10% of the lake surface area. The Secchi disk depth ranged from 2.6 to 5.63m) and was lowest in July 2003 when the integrated depth chlorophyll a concentration was elevated (37.5 µg/L). The more recent 2014 Secchi and chlorophyll a data were indicative of improved conditions (chlorophyll a ≤11.7 ug/L and Secchi disk depth of 3.6m in August 2014 and 5.63m in August 2015). There was some evidence of total phosphorus release from anoxic sediments during the August 2014 survey but the concentration was fairly low (0.012 mg/L). The Aquatic Life Use is assessed as fully supporting for Fresh Pond based on the generally good water quality conditions documented during the summer 2003, 2014, and 2015 monitoring data collected by MassDEP and the Town of Plymouth. This use is identified with an Alert Status because of low DO at depth and the one high depth integrated chlorophyll a measurement indicative of nutrient enrichment

FURNACE BROOK (MA94-52)

Location:	Headwaters outlet Soules Pond, Kingston to mouth at confluence with Jones River, Kingston.
AU Type:	RIVER
AU Size:	0.9 MILES
Classification/Qualifier:	B

FURNACE BROOK - MA94-52

Watershed Area: 2.23 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.22	2.22	0.77	0.77
Agriculture	2.4%	2.4%	6.8%	6.8%
Developed	29.5%	29.5%	15.1%	15.1%
Natural	57.8%	57.8%	59.4%	59.4%
Wetland	10.4%	10.4%	18.8%	18.8%
Impervious Cover	11.3%			

Fish, other Aquatic Life and Wildlife Use: Insufficient Information
According to DMF biologists (Chase 2016 and 2017), the existing fishway at the Soules Pond Dam in Kingston allows passage of river herring and American eel with a passage rating of 3 (a minor obstruction). Fishway redesign and/or maintenance could improve passage. Therefore, there is no impairment for diadromous fish passage for the Furnace Brook Assessment Unit MA94-52. No other data are available to assess the status of the Aquatic Life Use.

Furnace Pond (MA94043)

Location:	Pembroke.
AU Type:	FRESHWATER LAKE
AU Size:	103 ACRES
Classification/Qualifier:	A: PWS, ORW

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Fanwort*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting (Alert)
The Aquatic Life Use is assessed as not supporting based on the presence of the non-native aquatic macrophyte *Cabomba caroliniana*. The historical listing for low DO is also being carried forward despite the minimum DO at depth of 7.0mg/L during the 17 September 2003 survey. The Alert Status is also being maintained based on observations of a blue-green algae bloom, and other indicators of nutrient enrichment documented during the September 2003 survey.

Governor Winslow House Pond (MA94047)

Location:	Marshfield.
AU Type:	FRESHWATER LAKE
AU Size:	23 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for Governor Winslow House Pond.

Great Herring Pond (MA94050)

Location:	Bourne/Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	415 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	5	Dissolved Oxygen		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting (Alert)
A deep-hole profile was made in July 2003 that indicated low DO (<1.0 mg/L) in water > 7.5m (~25') (thermocline somewhere between 6.5 and 7.5 m) although Secchi disk depth was good (4.2 m) and the depth integrated chlorophyll a concentration was fairly low (5.5 mg/m^3). Similar conditions were documented during the depth profiles conducted by Town of Plymouth volunteers during the summers of 2015, 2016, and 2017. Based on the low DO in bottom waters that encompass ~80% of the lake surface area the Aquatic Life Use is assessed as not supporting. While sufficient diadromous fish passage currently exists, the alert status will be kept since this herring run is such an important resource in the region and the weir and pool fishway at the canal Motel further downstream has good passage now but is aging and will need attention soon..

Great Sandy Bottom Pond (MA94053)

Location:	Pembroke.
AU Type:	FRESHWATER LAKE
AU Size:	103 ACRES
Classification/Qualifier:	A: PWS, ORW

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for Great Sandy Bottom Pond.

Great South Pond (MA94054)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	285 ACRES
Classification/Qualifier:	A: PWS, ORW

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	5	Dissolved Oxygen		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Town of Plymouth's deep hole depth profile data collected in Great South Pond on 27 August 2014 documented oxygen depletion (i.e., <5.0mg/L) at depths below 3.4m (~12') representing roughly 70% of the lake surface area. The total phosphorus concentrations were very low (≤0.006 mg/L) throughout the water column. Secchi disk depth was very good (5.1m). The Aquatic Life Use for Great South Pond is assessed as not supporting because of the oxygen depletion at depth comprising more than 10% of the lake surface area.

Green Harbor (MA94-11)

Location:	From the tidegates at Route 139, Marshfield to the mouth of the harbor at Massachusetts Bay/Cape Cod Bay, Marshfield.
AU Type:	ESTUARY
AU Size:	0.08 SQUARE MILES
Classification/Qualifier:	SA: SFO

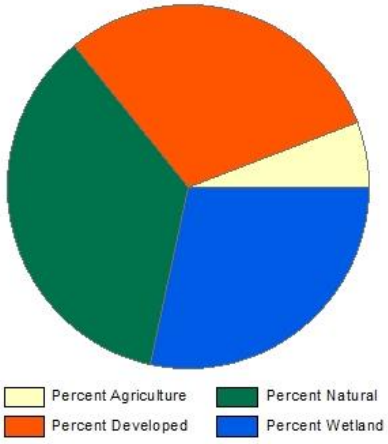
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for Grreen Harbor. The Alert Status that was previously identified (barrier to fish passage at the dike and the limited tidal flushing) is being removed based on current assessment guidance.

Green Harbor River (MA94-10)

Location:	Headwaters, outlet Black Mountain Pond, Marshfield to the tidegate at Route 139, Marshfield.
AU Type:	RIVER
AU Size:	5.7 MILES
Classification/Qualifier:	B

Green Harbor River - MA94-10

Watershed Area: 7.3 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	7.3	5.57	2.82	2.31
Agriculture	5.8%	5.4%	10.9%	9.6%
Developed	30.1%	32%	12%	11%
Natural	35.7%	31%	35%	32.8%
Wetland	28.4%	31.7%	42.1%	46.6%
Impervious Cover	10.9%			

Fish, other Aquatic Life and Wildlife Use: Not Supporting
Limited water quality data were collected at one station (W0337) in the Green Harbor River on the upstream side of the Route 139 bridge, Marshfield during the summer of 2006. The station proved difficult to sample due to the tide gates just downstream and the increased water velocity that sometime occurred at the station (Carr and Reardon 2012). Limited DO, pH, and temperature data indicated generally good conditions although tidal influence (elevated conductivity) was evident during at least one survey. Total Phosphorus and Total Nitrogen concentrations were also somewhat elevated on a few occasions but no other indicators of nutrient enrichment was noted. The original impairments of the Aquatic Life Use were based on the flow regime modifications from the tide gate structure. These gates also prevent most of the anadromous fish migration. These impairments are being carried forward.

Gunners Exchange Pond (MA94055)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	26 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)
Evaluation of the Town of Plymouth's deep hole depth profile data collected on 20 August 2014 documented good oxygen concentrations to a depth of 6.0m (≥5.0 mg/L) in Gunners Exchange Pond. DO was depleted at the 7m depth (0.6mg/L). There is no bathymetric data available to estimate the lake surface area exhibiting oxygen depletion. DO was good throughout the entire water column during the deep hole profile conducted on 14 September 2015 ranging from 6.7 to 8.0 mg/L. Total phosphorus concentrations were low (0.0085 to 0.0116 mg/L) at both the surface and bottom and below the recommended guideline of 0.025 mg/L on 14 September 2015. Chlorophyll a concentrations were also very low (≤2.7 µg/L) during both surveys. Secchi disk depths were very good (5.5 and 6.4m). The Aquatic Life Use is assessed as fully supporting for Gunners Exchange Pond but is identified with an Alert Status because of low DO near the bottom during the 20 August 2014 survey.

HALLS BROOK (MA94-57)

Location:	Tidal portion east of Maple Street, Kingston to mouth at confluence with Jones River, Kingston.
AU Type:	ESTUARY
AU Size:	0.003 SQUARE MILES
Classification/Qualifier:	SA: SFO

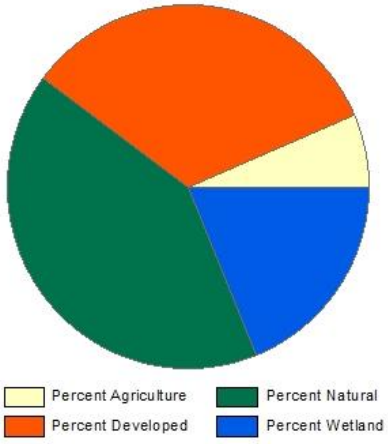
Fish, other Aquatic Life and Wildlife Use: Insufficient Information
With the exception of a few nitrogen samples collected in 2011, no recent data are available to assess the Aquatic Life Use for this Halls Brook AU.

HALLS BROOK (MA94-58)

Location:	From the inlet of Blackwater Pond, Kingston to tidal portion east of Maple Street, Kingston.
AU Type:	RIVER
AU Size:	1.1 MILES
Classification/Qualifier:	B

HALLS BROOK - MA94-58

Watershed Area: 4.18 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	4.18	4.17	1.59	1.59
Agriculture	6.5%	6.5%	9.5%	9.5%
Developed	33.3%	33.2%	23%	23%
Natural	41.3%	41.3%	36.5%	36.5%
Wetland	18.9%	18.9%	31.1%	31.1%
Impervious Cover	14.4%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	4c	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Maple Street Dam (also referred to as Mill Pond Dam), just downstream from Maple Street in Kingston, does not allow passage (passage score of 10—no possible passage) for river herring as well as rainbow smelt along Halls Brook. Based on this obstruction, the Aquatic Life Use is assessed as impaired for Halls Brook (Assessment Unit MA94-58).

Harrobs Corner Bog Pond (MA94061)

Location:	Plympton.
AU Type:	FRESHWATER LAKE
AU Size:	20 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for Harrobs Corner Bog Pond AU MA94061.

Hedges Pond (MA94065)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	27 ACRES
Classification/Qualifier:	B

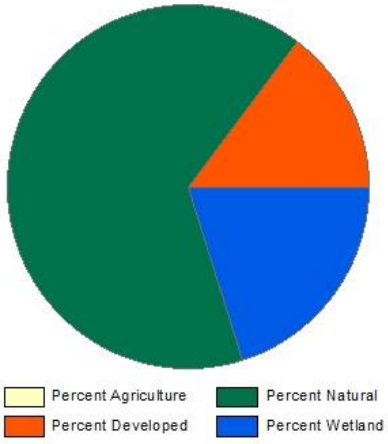
Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)
The Town of Plymouth's deep hole depth profile data collected in Hedges Pond on 11 September 2014 documented good conditions. Oxygen concentrations were good at all depths (DO minimum 8.8 mg/L), and both chlorophyll a and total phosphorus concentrations were very low (≤1.55µg/L and 0.008 mg/L, respectively). Secchi disk depth was very good (3.2m). The Aquatic Life Use for Hedges Pond is assessed as fully supporting based on these data. The pH and alkalinity of the pond, however, were very low (5.7 SU and a high of 1.4 mg $CaCO_3$/L) which is of concern so low pH is identified with an Alert.

Herring Brook (MA94-29)

Location:	Headwaters, outlet Lily Pond, Cohasset to mouth at confluence with Aaron River, Cohasset.
AU Type:	RIVER
AU Size:	0.3 MILES
Classification/Qualifier:	A: PWS, ORW

Herring Brook - MA94-29

Watershed Area: 2.53 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.4	2.4	0.49	0.49
Agriculture	0.8%	0.8%	0.9%	0.9%
Developed	14.7%	14.7%	13.1%	13.1%
Natural	64.5%	64.5%	40.8%	40.8%
Wetland	20%	20%	45.1%	45.1%
Impervious Cover	5%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added
4c	4c	(Fish Passage Barrier*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
Dense growth of the non-native aquatic macrophyte *Cabomba caroliniana* was observed in both Lily Pond and the Aaron River upstream from the Beechwood Street Dam so is presumed to be an infestation in Herring Brook as well.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Fish Passage Barrier	Applicable WQS attained, due to restoration activities	Two projects have improved habitat in this watershed area: Culvert reconstruction at the Beechwood Street Dam was conducted in 2016. DMF scores passage =3 and notes the site/fishway design will be limited by water supply operations and the Hunters Pond Dam in Scituate and Cohasset, Massachusetts was removed between July

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
		and September 2017. The spillway was notched to ensure a gradual release of water from the impoundment, letting Bound Brook flow free again after being dammed for centuries. As the first barrier upstream from the Atlantic Ocean, the dam's removal restores 5-miles of river spawning ground and habitat for alewife, blueback herring, American eel, rainbow smelt, sea lamprey and other important species. The project was funded by grants from the Massachusetts Department of Ecological Restoration and the NOAA and included many other project partners including the Town of Scituate, Princeton Hydro, T Ford Company, and the U.S. Fish and Wildlife Service (http://scituate.wickedlocal.com/news/20170901/hunters-pond-dam-dam-removal-paves-way-for-improvements and http://www.princetonhydro.com/blog/dam-removal/

Supporting Information for Delisted Impairments

Fish Passage Barrier

According to DMF biologists (Chase 2016, Chase 2017) two projects have improved diadromous fish habitat in this subwatershed area:

1. Culvert reconstruction at the Beechwood Street Dam was conducted in 2016. DMF scores passage =3 and notes the site/fishway design will be limited by water supply operations.

2. The Hunters Pond Dam in Scituate and Cohasset, Massachusetts was removed between July and September 2017. The spillway was notched to ensure a gradual release of water from the impoundment, letting Bound Brook flow free again after being dammed for centuries. As the first barrier upstream from the Atlantic Ocean, the dam's removal restores 5-miles of river spawning ground and habitat for alewife, blueback herring, American eel, rainbow smelt, sea lamprey and other important species. The project was funded by grants from the Massachusetts Department of Ecological Restoration and the NOAA and included many other project partners including the Town of Scituate, Princeton Hydro, T Ford Company, and the U.S. Fish and Wildlife Service (http://scituate.wickedlocal.com/news/20170901/hunters-pond-dam-dam-removal-paves-way-for-improvements and http://www.princetonhydro.com/blog/dam-removal/

Herring River (MA94-07)

Location:	Headwaters, outlet Old Oaken Bucket Pond, Scituate to mouth at confluence with North River, Scituate.
AU Type:	ESTUARY
AU Size:	0.08 SQUARE MILES
Classification/Qualifier:	SA: SFO

Fish, other Aquatic Life and Wildlife Use: Insufficient Information (Alert)

Water quality (W1511) and benthic macroinvertebrate sampling (B0599) was conducted by MassDEP biologists in the very upper reach of this Herring River AU near the New Driftway Bridge in Scituate in the summer of 2006. While the water quality data (DO, pH, temperature, and nutrients) were indicative of generally good conditions (minimum DO 5.8mg/L, maximum temperature 25.7°C, average total phosphorus concentration 0.059mg/L), the RPBIII analysis of the benthic macroinvertebrate sample indicated severely impacted conditions (only 5% comparable to the reference station (B0590)). Habitat quality was notably poor decreasing confidence in the results of the RPBIII analysis. Near the lower end of the AU, the Herring River receives the discharge from the town of Scituate's WWTP, via a tidal creek tributary. The effluent has not exhibited any acute toxicity to either *M. bahia* or *M. beryllina*. No chronic whole effluent toxicity to *M. beryllina* has been detected since April 2012 and none has been detected by *A. punctulata* since July 2015.

Nearly 80% of the Scituate water supply is provided from sources in the upper Herring River Watershed. Since 2007 the town has worked to create a multi-pronged approach to balancing municipal water demand and ecological flow needs with the end goal of restoring more natural conditions and providing adequate flow for herring migration in the Herring River Watershed. In 2011 implementation efforts included summer irrigation restrictions and release of streamflow as part of a Water Division Operational Plan and in 2012 some herring migration was documented (small numbers of fish each spring after decades of no herring at all). Additionally, improvements at the Old Oaken Bucket fish ladders (weir adjustments in 2013) and preliminary design improvements to the Reservoir dam and fish ladder (2013 and 2014) were funded by two MassDEP Sustainable Water Management Initiative (SWMI) grants.

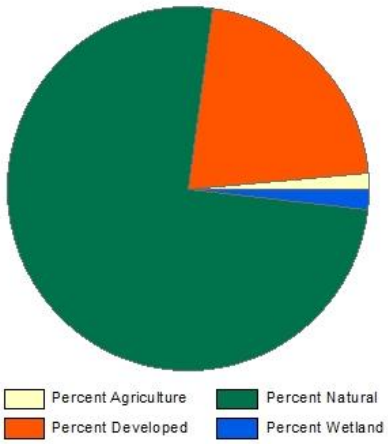
While the lack of diversity reflected in the macroinvertebrate community and habitat quality degradation found in the very upper reach of this Herring River AU during the 2006 survey are of concern, since 2007 efforts have been undertaken by the town of Plymouth to improve flows and restore ecological functions in the Herring River watershed. Therefore, there is currently insufficient information to assess the Aquatic Life Use for this Herring River AU. The former Alert Status issues for the smelt spawing habitat area (low flows, algal growth that may also be exacerbated by flow manipulation, the disturbed riparian buffer zone adjacent to this habitat) are being maintained and lack of diversity of the benthic community is being added.

HERRING RIVER (MA94-44)

Location:	Headwaters outlet Great Herring Pond, Bourne to confluence with Cape Cod Canal, Bourne (includes the approximately 0.3 miles through Foundry Pond and the unnamed tributary locally known as 'The Herring Run').
AU Type:	RIVER
AU Size:	1.3 MILES
Classification/Qualifier:	B

HERRING RIVER - MA94-44

Watershed Area: 7.77 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	7.76	4.25	1.01	0.76
Agriculture	1.4%	1.8%	6.5%	5.6%
Developed	21.5%	22.9%	30.4%	35.4%
Natural	75.3%	73.4%	54.7%	51.5%
Wetland	1.8%	1.9%	8.4%	7.4%
Impervious Cover	8.8%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)
The Aquatic Life Use is assessed as fully supporting based on the DFG fish sampling data collected in August 2007. The sample contained two fluvial specialist/dependant species and was comprised of 39% moderately intolerant individuals. Additionally, the Herring River supports one of the Commonwealth's most productive river herring populations and currently has adequate passage for diadromous fishes. An alert status will be identified since this herring run is such an important resource in the region and the weir and pool fishway at the canal Motel has good passage now but is aging and will need attention soon.

Hobomock Pond (MA94177)

Location:	Pembroke.
AU Type:	FRESHWATER LAKE
AU Size:	13 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed.

Hoyts Pond (MA94070)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	20 ACRES
Classification/Qualifier:	B

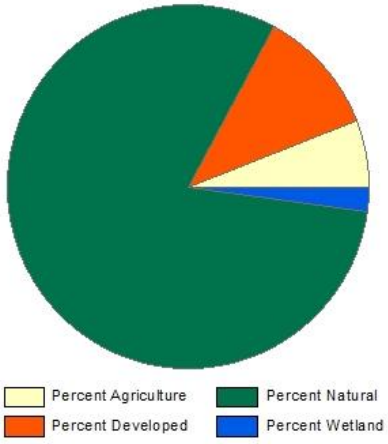
Fish, other Aquatic Life and Wildlife Use: Fully Supporting
Evaluation of the Town of Plymouth's deep hole depth profile data collected on 20 August 2014 and 14 September 2015 documented good oxygen concentrations throughout the water column in Hoyts Pond (≥6.8 mg/L). Total phosphorus concentrations were low (0.0106 to 0.0085 mg/L) at both the surface and bottom and below the recommended guideline of 0.025 mg/L on 14 September 2015. Chlorophyll a concentrations were also very low (≤1.11 µg/L) during both surveys. Secchi disk depths were very good (3.5 and 4.7m). The Aquatic Life Use is assessed as fully supporting for Hoyts Pond based on these data.

INDIAN BROOK (MA94-51)

Location:	outlet of cranberry bogs west of Indian Brook Road, Plymouth to mouth at inlet Cape Cod Bay, Plymouth.
AU Type:	RIVER
AU Size:	1.4 MILES
Classification/Qualifier:	B

INDIAN BROOK - MA94-51

Watershed Area: 6.37 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	6.36	4.98	1.55	1.54
Agriculture	5.9%	7.5%	22.3%	22.4%
Developed	11.3%	11.2%	6.4%	6.4%
Natural	80.6%	78.4%	65.9%	65.7%
Wetland	2.2%	2.8%	5.5%	5.5%
Impervious Cover	7%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	5	(Fanwort*)		Added
--	5	(Non-Native Aquatic Plants*)		Added
--	5	Nutrient/Eutrophication Biological Indicators		Added
--	5	Phosphorus, Total		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

Water quality sampling was conducted by MassDEP biologists in the Indian Brook Dam impoundment during the summer of 2008 as part of the baseline lake sampling effort. The impoundment was fairly shallow (max depth ~2.0m) and dense/very dense submerged vegetation were recorded during the June, July, and August surveys. *Cabomba caroliniana* and *Myriophyllum heterophyllum*, as well as *Wolffiella gladiata* and the duckweed, *Spirodela polyrhiza*, were recorded. The minimum DO was 4.3mg/L at 1.0m depth during the 20 August survey, while concentrations were better near the surface in June and August (10.5 and 5.6 mg/L, respectively). Integrated depth chlorophyll a concentrations ranged from <1.0 to 9.0 mg/m^3 and was highest during the August survey as was the maximum total phosphorus concentration (0.12 mg/L). The seasonal average of total phosphorus was 0.098mg/L. Low pH was also documented (5.4 to 5.6 SU) during the August survey. MA DFG

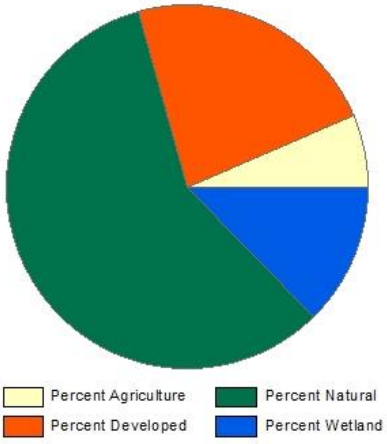
biologists conducted backpack electrofishing in July 2010 near Cod Road in Plymouth. Seven American eel were captured during the survey although overgrowth obstructions were noted which likely made sampling difficult. The Aquatic Life Use is assessed as not supporting for Indian Brook based on the presence of the non-native aquatic macrophytes *Cabomba caroliniana* and *Myriophyllum heterophyllum* documented in the impoundment, and the biological indicators of nutrient enriched conditions (dense/very dense growth of the macrophytes, notes about filamentous algae on plants, presence of wolffia and lemna), and the elevated concentration of total phosphorus suspected to result from the upstream cranberry bog operations.

INDIAN HEAD BROOK (MA94-49)

Location:	Headwaters outlet Indian Head Pond, Hanson to inlet Wampatuck Pond, Hanson.
AU Type:	RIVER
AU Size:	0.9 MILES
Classification/Qualifier:	B

INDIAN HEAD BROOK - MA94-49

Watershed Area: 1.49 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.49	1.49	0.61	0.61
Agriculture	6.4%	6.4%	15.8%	15.8%
Developed	23%	23%	14.6%	14.6%
Natural	57.9%	57.9%	46.9%	46.9%
Wetland	12.7%	12.7%	22.6%	22.6%
Impervious Cover	8.7%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	4c	(Fish Passage Barrier*)		Added

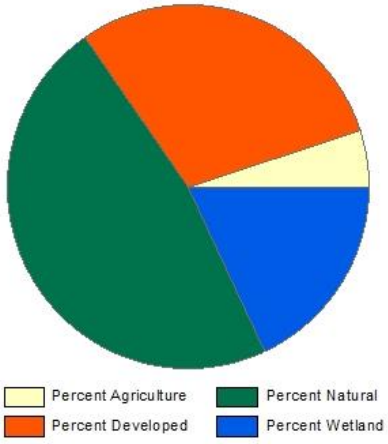
Fish, other Aquatic Life and Wildlife Use: Not Supporting
According to DMF biologists (Chase 2016 and 2017), there is one barrier along the Indian Head River in Hanover/Hanson, the State Street Dam that is located downstream from the confluence with Indian Head Brook as well as one barrier at the Wampatuck Pond Dam that do not allow passage of river herring, American eel, and/or American shad along Indian Head Brook: the State Street Dam (passage score of 8- severe impediment) and the Wampatuck Pond Dam (passage score of 10—no possible passage). Based on these obstructions, the Aquatic Life Use is assessed as impaired for Indian Head Brook (Assessment Unit MA94-49).

INDIAN HEAD BROOK (MA94-50)

Location:	Outlet Wampatuck Pond, Hanson to mouth at confluence with Indian Head River, Hanson.
AU Type:	RIVER
AU Size:	2.1 MILES
Classification/Qualifier:	B

INDIAN HEAD BROOK - MA94-50

Watershed Area: 4.61 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	4.61	4.07	1.63	1.4
Agriculture	5.1%	3.4%	13.2%	8.9%
Developed	29.6%	28.9%	17.9%	17%
Natural	47.3%	48.7%	42%	45.2%
Wetland	18.1%	19%	26.9%	28.9%
Impervious Cover	11.2%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	4c	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
According to DMF biologists (Chase 2016 and 2017), there is one barrier along the Indian Head River in Hanover/Hanson, the State Street Dam that is located downstream from the confluence with Indian Head Brook as well as one barrier at the Wampatuck Pond Dam that do not allow passage of river herring, American eel, and/or American shad along Indian Head Brook: the State Street Dam (passage score of 8- severe impediment) and the Wampatuck Pond Dam (passage score of 10—no possible passage). Based on these obstructions, the Aquatic Life Use is assessed as impaired for Indian Head Brook (Assessment Unit MA94-50). It should be noted however that multiple age classes of eastern brook trout were documented in the brook at one station (391) near Brook Street in Hanson in July 2001.

Indian Head Pond (MA94071)

Location:	Hanson.
AU Type:	FRESHWATER LAKE
AU Size:	120 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Fish Passage Barrier*)		Added

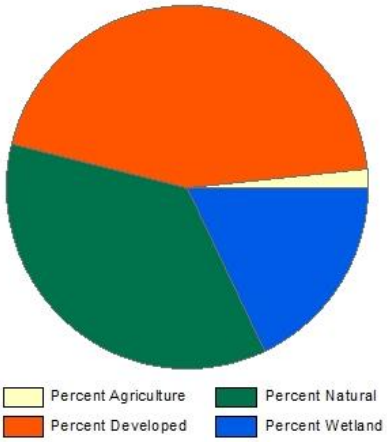
Fish, other Aquatic Life and Wildlife Use: Not Supporting (Alert)
One prolonged algal bloom occurred in Indian Head Pond in 2009 but none since. According to DMF biologists (Chase 2016 and 2017), there is one barrier along the Indian Head River in Hanover/Hanson, the State Street Dam that is located downstream from the confluence with Indian Head Brook as well as one barrier at the Wampatuck Pond Dam on Indian Head Brook that do not allow passage of river herring, American eel, and/or American shad along Indian Head Brook and up into Indian Head Pond: the State Street Dam (passage score of 8- severe impediment) and the Wampatuck Pond Dam (passage score of 10—no possible passage). Based on these obstructions, the Aquatic Life Use is assessed as not supporting for Indian Head Pond. This use is also identified with an Alert Status because of the documented bloom.

Indian Head River (MA94-04)

Location:	Headwaters, outlet Factory Pond, Hanover/Hanson to Curtis Crossing Dam (also called Ludhams Ford Dam (NATID: MA00428)) west of Elm Street, Hanover/Pembroke.
AU Type:	RIVER
AU Size:	2.8 MILES
Classification/Qualifier:	B: WWF

Indian Head River - MA94-04

Watershed Area: 30.45 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	30.43	9.55	9.28	3
Agriculture	1.6%	1.4%	2.8%	1.5%
Developed	44.6%	37.9%	29.7%	24.4%
Natural	35.9%	41.1%	38.3%	44%
Wetland	18%	19.6%	29.2%	30.1%
Impervious Cover	16.2%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Dissolved Oxygen		Removed
5	5	(Fish Passage Barrier*)		Added
5	5	Phosphorus, Total		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The RPBIII status of the benthic macroinvertebrate sample collected in the summer of 2006 (B0597) from the INDIAN HEAD RIVER/ , approximately 200 meters downstream from Cross Street/State Street, Hanover/Hanson, MA) was found to be 60% comparable (slightly impaired) when compared to the reference station (B0590). With the exception of total phosphorus concentrations which were somewhat elevated (average 0.085 and maximum 0.12 mg/L) water quality data collected at one station (W1528) downstream from Cross/State Street in Hanover/Hanson during the summer of 2006 were indicative of good conditions (i.e., minimum DO concentration 6.04 mg/L during the three probe deployments, maximum temperature 27.7°C, good pH, lack of any indicators of nutrient enrichment including maximum diel changes in DO only 1.0 mg/L, lack of any supersaturation and very small changes in saturation). According to DMF biologists, however, there are two barriers along this segment of Indian Head River in Hanover/Hanson that do not allow passage of river herring, American eel, and/or American shad: the State Street Dam in Hanover/Hanson (passage score 8 - severe impediment), and the Factory Pond Dam in Hanover/Hanson (passage score of 10—no possible passage).

Excellent passage is available with the fishway at the Elm Street Dam in Hanover/Pembroke at the most downstream end of this assessment unit of the Indian Head River. So based on the two obstructions, the Aquatic Life Use is assessed as impaired for Indian Head River (Assessment Unit MA94-04).

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Dissolved Oxygen	Applicable WQS attained; original basis for listing was incorrect	The notes from the original (1992) reporting cycle indicated that natural conditions cause DO and nutrient excursions from wetlands. Excursions that result from natural conditions are not considered to be impairments. Furthermore, the DO (minimum 6.04 mg/L during the 3 probes deployments) and other water quality data collected from the Indian Head River in 2006 were indicative of good conditions so this cause of impairment is being delisted.
Phosphorus, Total	Applicable WQS attained; original basis for listing was incorrect	The notes from the original (1992) reporting cycle indicated that natural conditions cause DO and nutrient excursions from wetlands. Excursions that result from natural conditions are not considered to be impairments. While the total phosphorus concentrations were somewhat elevated during the 2006 survey (average 0.085 and maximum 0.12 mg/L) the benthic macroinvertebrate RBPIII analysis and all of the other water quality data collected during the summer of 2006 were indicative of good conditions (i.e., good DO and a lack of any other indicators of nutrient enrichment including maximum diel changes in DO of only 1.0 mg/L, lack of any supersaturation and very small changes in saturation, lack of any observations of dense or very dense filamentous algae or other objectionable growths). Therefore based on the weight-of-evidence approach outlined in the 2018 CALM guidance manual, this cause of impairment is being delisted.

Supporting Information for Delisted Impairments

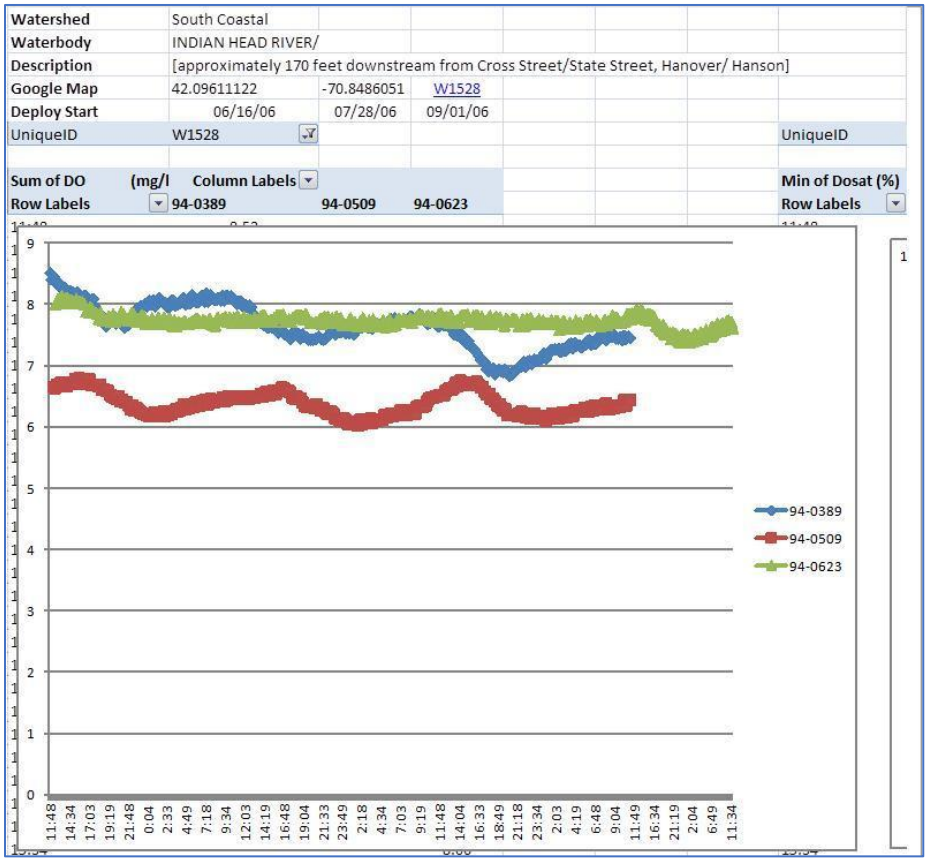
Dissolved Oxygen

MassDEP DO probe data Indian Head River approximately 170 feet downstream from Cross Street/State Street, Hanover/ Hanson (W1528) (MassDEP UndatedC):

Unique ID	Waterbody	AU_Class	Qualifier	Start.Date	Days	OWMID.Minimum.DO	Daily Mean Minimum DO	Maximum Daily DO Shift	OWMID Mean DO	OWMID Maximum Saturation
W1528	INDIAN HEAD RIVER	B	WWF	06/16/06	3	6.85	7.13	1.00	7.66	92.1

W1528	INDIAN HEAD RIVER	B	WWF	07/28/06	3	6.04	6.09	0.73	6.39	87.2
W1528	INDIAN HEAD RIVER	B	WWF	09/01/06	4	7.40	7.53	0.52	7.73	89.1

DO probe deployment graph Indian Head River approximately 170 feet downstream from Cross Street/State Street, Hanover/ Hanson (MassDEP UndatedA):



Indian Head River approximately 170 feet downstream from Cross Street/State Street, Hanover/ Hanson (W1528) MassDEP (UndatedA):

Unique ID	Gear Type	Project Name	OWMIDs Used to Build File	
W1528	Data Sonde	South Coastal (2006)	94-0389, 94-0509, 94-0623	
Station ID	**Station Description**	**Mile Point**	**Latitude (dec-degrees)**	**Longitude (dec-degrees)**
IH102A	[approximately 170 feet downstream from Cross Street/State Street, Hanover/ Hanson]		42.09611122	-70.84860506
Watershed	**SARIS_PALIS_CAMIS**	**Water Body**		
South Coastal	9456800	INDIAN HEAD RIVER/		
Station File Start Time	6/16/2006 11:48 AM			
Station File End Time	9/5/2006 11:49 AM			
Total Station File Duration (Hours)	1944.0			
Total Station File Count	7777			
	Analytes			
	Temperature (Celsius)	**DO (mg/L)**	**DOsat (%)**	
Observed Deployment Time (Hours)	236.8	236.8	236.8	
Observed Count	950	950	950	
Avg*	21.6	7.3	83	
SD*	3.3	0.6	4	
Min*	17.8	6.0	75	
Max*	27.7	8.5	92	
Median*	20.2	7.6	83	
IQR*	6.3	1.2	5	
Mean of the Daily Mean*	21.5	7.3		
Mean of the Daily Min*	20.3	7.0		
Mean of the Daily Max*	22.9	7.6		
MWAT*	--			
Amount of Time > 20 deg. C (Hours)	121.3			
Max Duration > 20 deg. C (Hours)	70.5			
Avg Daily Amount of Time > 20 deg. C	11.3			
Amount of Time > 28.3 deg. C (Hours)	0.0			
Max Duration > 28.3 deg. C (Hours)	0.0			
Avg Daily Amount of Time > 28.3 deg.	0.0			
Amount of Time > 29.4 deg. C (Hours)	0.0			
Max Duration > 29.4 deg. C (Hours)	0.0			
Avg Daily Amount of Time > 29.4 deg.	0.0			
Amount of Time < 3.0 mg/L (Hours)		0.0		
Max Duration < 3.0 mg/L (Hours)		0.0		
Avg Daily Amount of Time < 3.0 mg/L		0.0		
Amount of Time < 4.0 mg/L (Hours)		0.0		
Max Duration < 4.0 mg/L (Hours)		0.0		
Avg Daily Amount of Time < 4.0 mg/L		0.0		
Amount of Time < 5.0 mg/L (Hours)		0.0		
Max Duration < 5.0 mg/L (Hours)		0.0		
Avg Daily Amount of Time < 5.0 mg/L		0.0		
Amount of Time < 6.0 mg/L (Hours)		0.0		
Max Duration < 6.0 mg/L (Hours)		0.0		
Avg Daily Amount of Time < 6.0 mg/L		0.0		

*Units are those of the analyte listed. SD is unitless.

Attended probes measurements were collected by MassDEP staff in the Indian Head River approximately 170 feet downstream from Cross Street/State Street, Hanover/ Hanson (W1528) during the summer 2006. Dissolved oxygen readings were obtained on 11 occasions with 0 recordings < 5mg/L (MassDEP UndatedC):

attended data

Waterbody	UNIQUE_ID	DESCRIPTOR	DATE	TIME	DO	DOSAT	ResComm
Indian Head Ri	W1528	[approximately 170 feet downstream from Cross Street/State Stree	6/21/2006	11:56:03 AM	7.7	90	
Indian Head Ri	W1528	[approximately 170 feet downstream from Cross Street/State Stree	6/16/2006	11:44:02 AM	8.1	87	
Indian Head Ri	W1528	[approximately 170 feet downstream from Cross Street/State Stree	6/19/2006	11:10:03 AM	7.6	88	
Indian Head Ri	W1528	[approximately 170 feet downstream from Cross Street/State Stree	7/6/2006	11:55:32 AM	7.2	84	
Indian Head Ri	W1528	[approximately 170 feet downstream from Cross Street/State Stree	7/28/2006	12:18:33 PM	6.7	83	
Indian Head Ri	W1528	[approximately 170 feet downstream from Cross Street/State Stree	7/31/2006	11:15:02 AM	6.5	80	
Indian Head Ri	W1528	[approximately 170 feet downstream from Cross Street/State Stree	8/2/2006	11:51:33 AM	6.4	83	
Indian Head Ri	W1528	[approximately 170 feet downstream from Cross Street/State Stree	9/6/2006	12:00:05 PM	7.5	82	
Indian Head Ri	W1528	[approximately 170 feet downstream from Cross Street/State Stree	9/1/2006	12:38:05 PM	8.2	88	
Indian Head Ri	W1528	[approximately 170 feet downstream from Cross Street/State Stree	9/5/2006	11:52:35 AM	7.8	85	
Indian Head Ri	W1528	[approximately 170 feet downstream from Cross Street/State Stree	10/11/2006	11:48:00 AM	8.1	80	

Attended Data				
UniqueID	Waterbody	Count DO	Count DO CWF LT5.0	DOSAT max
W1528	INDIAN HEAD RIVER	11	0	90

Indian Head River approximately 170 feet downstream from Cross Street/State Street, Hanover/ Hanson (W1528) MassDEP (UndatedA):

Unique ID	Gear Type	Project Name	OWMIDs Used to Build File	
W1528	Data Sonde	South Coastal (2006)	94-0389, 94-0509, 94-0623	
Station ID	Station Description	Mile Point	Latitude (dec-degrees)	Longitude (dec-degrees)
IH102A	[approximately 170 feet downstream from Cross Street/State Street, Hanover/ Hanson]		42.09611122	-70.84860506
Watershed	SARIS_PALIS_CAMIS	Water Body		
South Coastal	9456800	INDIAN HEAD RIVER/		
Station File Start Time	6/16/2006 11:48 AM			
Station File End Time	9/5/2006 11:49 AM			
Total Station File Duration (Hours)	1944.0			
Total Station File Count	7777			
	Analytes			
	Temperature (Celsius)	DO (mg/L)	DOsat (%)	
Observed Deployment Time (Hours)	236.8	236.8	236.8	
Observed Count	950	950	950	
Avg*	21.6	7.3	83	
SD*	3.3	0.6	4	
Min*	17.8	6.0	75	
Max*	27.7	8.5	92	
Median*	20.2	7.6	83	
IQR*	6.3	1.2	5	
Mean of the Daily Mean*	21.5	7.3	[redacted]	
Mean of the Daily Min*	20.3	7.0		
Mean of the Daily Max*	22.9	7.6		
MWAT*	--	[redacted]		
Amount of Time > 20 deg. C (Hours)	121.3			
Max Duration > 20 deg. C (Hours)	70.5			
Avg Daily Amount of Time > 20 deg. C (Hours)	11.3			
Amount of Time > 28.3 deg. C (Hours)	0.0			
Max Duration > 28.3 deg. C (Hours)	0.0			
Avg Daily Amount of Time > 28.3 deg. C (Hours)	0.0			
Amount of Time > 29.4 deg. C (Hours)	0.0			
Max Duration > 29.4 deg. C (Hours)	0.0			
Avg Daily Amount of Time > 29.4 deg. C (Hours)	0.0			
Amount of Time < 3.0 mg/L (Hours)	[redacted]	0.0		
Max Duration < 3.0 mg/L (Hours)		0.0		
Avg Daily Amount of Time < 3.0 mg/L (Hours)		0.0		
Amount of Time < 4.0 mg/L (Hours)		0.0		
Max Duration < 4.0 mg/L (Hours)		0.0		
Avg Daily Amount of Time < 4.0 mg/L (Hours)		0.0		
Amount of Time < 5.0 mg/L (Hours)		0.0		
Max Duration < 5.0 mg/L (Hours)		0.0		
Avg Daily Amount of Time < 5.0 mg/L (Hours)		0.0		
Amount of Time < 6.0 mg/L (Hours)		0.0		
Max Duration < 6.0 mg/L (Hours)		0.0		

Phosphorus, Total

(MassDEP UndatedC): Water quality sampling was conducted by MassDEP staff at Indian Head River approximately 170 feet downstream from Cross Street/State Street, Hanover/ Hanson (W1528) MassDEP (UndatedA). The average total phosphorus was 0.085 mg/L (n=5) while the maximum total phosphorus was 0.12 mg/L. There were no observations of dense or very dense filamentous algae noted. The maximum daily DO shift was 1 and the maximum DO saturation was 92%.

`Nutrient Relate Data`

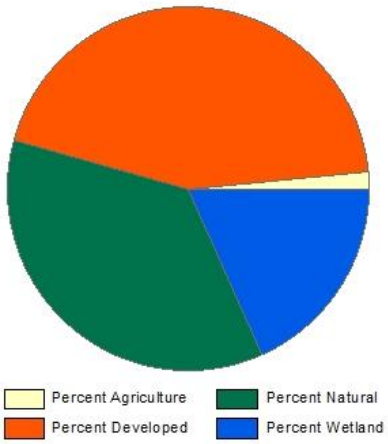
UniqueID	Waterbody	Count	Year	Count	TP Avg	TP Max	Fieldsheets	Filamentous Dense.or Very Dense	Max Daily DO Shift	Max Saturation
W1528	INDIAN HEAD RIVER	5	2006	5	0.085	0.12	6	0	1	92

Indian Head River (MA94-22)

Location:	From Curtis Crossing Dam (also called Ludhams Ford Dam (NATID: MA00428)) west of Elm Street, Hanover/Pembroke to mouth at confluence with Herring Brook, (forming headwaters of North River) Hanover/Pembroke.
AU Type:	RIVER
AU Size:	0.9 MILES
Classification/Qualifier:	B: ORW, WWF

Indian Head River - MA94-22

Watershed Area: 31.95 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	31.94	7.07	9.83	2.16
Agriculture	1.5%	0.7%	2.7%	0.9%
Developed	44.2%	38.5%	29.5%	24.9%
Natural	36%	42.6%	38.3%	45.7%
Wetland	18.3%	18.1%	29.5%	28.5%
Impervious Cover	16.2%			

Fish, other Aquatic Life and Wildlife Use: Insufficient Information
Although repairs to the existing fishway at the Elm Street Dam were made in 2008 and no barriers to diadromous fish passage occur in this segment of the Indian Head River (Assessment Unit MA94-22), too limited current data are available to assess the status of the Aquatic Life Use.

Indian Pond (MA94072)

Location:	Kingston/Plympton.
AU Type:	FRESHWATER LAKE
AU Size:	64 ACRES
Classification/Qualifier:	B

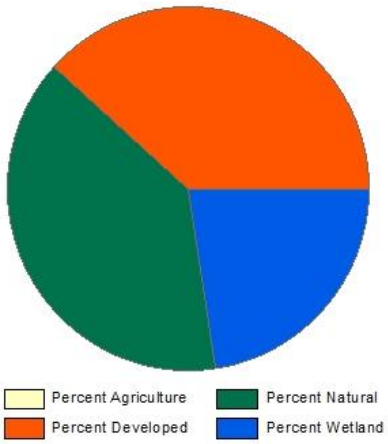
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No recent data are available to assess the Aquatic Life Use for Indian Pond.

Iron Mine Brook (MA94-24)

Location:	Headwaters north of Route 139, Hanover to mouth at confluence with Indian Head River, Hanover (area associated with North River Corridor designated as ORW).
AU Type:	RIVER
AU Size:	1.4 MILES
Classification/Qualifier:	B: ORW ("qualifier 'ORW' applies only to portion in North River Corridor")

Iron Mine Brook - MA94-24

Watershed Area: 1.38 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.38	1.38	0.46	0.46
Agriculture	0.8%	0.8%	0.4%	0.4%
Developed	38%	38%	29.4%	29.4%
Natural	38.9%	38.9%	39.1%	39.1%
Wetland	22.4%	22.4%	31.2%	31.2%
Impervious Cover	16.9%			

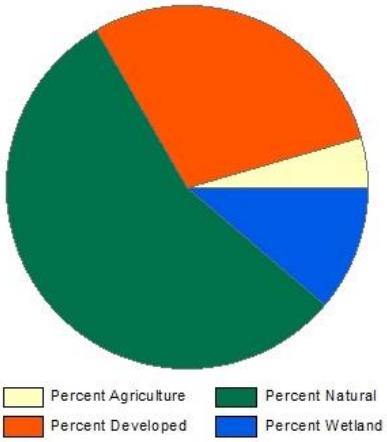
Fish, other Aquatic Life and Wildlife Use: Fully Supporting
The RPBIII status of the benthic macroinvertebrate sample collected in the summer of 2006 (B0596) from Iron Mine Brook (~approximately 100 meters downstream from Broadway, Hanover) was found to be 60% comparable (slightly impaired) when compared to the reference station (B0590). Backpack electrofishing at three stations in the brook in September 2013 documented fluvial specialist and/or dependent species as well as intolerant and moderately tolerant species. Water quality data collected at one station (W0910) at Elm Street crossing in Hanover during the summer of 2006 were also indicative of good conditions (deployed probe data for DO and temperature, as well as pH measurements and grab samples analyzed for ammonia-nitrogen and total phosphorus concentrations). All of these data are indicative of good conditions and therefore the Aquatic Life Use is assessed as fully supporting. The former alert status because of one elevated total phosphorus measurement during the summer of 2001 at the same station (W0910) is being removed since none of the measurements were elevated during the 2006 survey.

ISLAND CREEK (MA94-46)

Location:	Headwaters outlet Island Creek Pond, Duxbury to tidal portion south of Route 3A and west of Bryant Avenue, Duxbury (through former 2016 segment; Mill Pond MA94101).
AU Type:	RIVER
AU Size:	1 MILES
Classification/Qualifier:	B

ISLAND CREEK - MA94-46

Watershed Area: 1.69 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.69	1.69	0.71	0.71
Agriculture	4.4%	4.4%	10.1%	10.1%
Developed	29%	29%	20.8%	20.8%
Natural	55.3%	55.3%	49.2%	49.2%
Wetland	11.3%	11.3%	19.8%	19.8%
Impervious Cover	10.4%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	4c	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

According to DMF biologists (Chase 2016, 2017, 2018a), there are two remaining barriers along Island Creek in Duxbury that do not allow passage of river herring and American eel into Island Creek Pond: the outlet stream channel is substantially overgrown (passage score of 10- no possible passage), and the railroad bank culvert ~0.2 river miles south of Tremont Street in Duxbury (passage score of 4—restricted passage) also affecting rainbow smelt. It should be noted improvements for fish passage in this system include the new fishway installed at the Mill Pond Dam in 2007 as well as maintenance at the Island Creek Pond outlet control in 2007 and most recently the boulders from the former dam that were adjusted in 2017. Based on the current obstructions, however, the Aquatic Life Use is assessed as impaired for Island Creek (Assessment Unit MA94-46). The former Alert status identified for Former AU MA94101 can be removed because of the new fishway installed at the Mill Pond Dam in 2007.

ISLAND CREEK (MA94-47)

Location:	Tidal portion, Duxbury to mouth at Kingston Bay, Duxbury.
AU Type:	ESTUARY
AU Size:	0.01 SQUARE MILES
Classification/Qualifier:	SA: SFO

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for Island Creek AU MA94-47

Island Creek Pond (MA94073)

Location:	Duxbury.
AU Type:	FRESHWATER LAKE
AU Size:	40 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added
4c	4c	(Fish Passage Barrier*)		Added
4c	4c	(Non-Native Aquatic Plants*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Aquatic Life Use for Island Creek Pond is assessed as not supporting based on the presence of the non-native aquatic macrophyte *Cabomba caroliniana* documented during the 1996 DWM synoptic survey as well as the three barriers along Island Creek in Duxbury that do not allow passage of river herring and American eel into Island Creek Pond: the outlet stream channel is substantially overgrown (passage score of 10- no possible passage), the channel boulders from the former dam near Elm Street impeding passage (passage score of 4—restricted passage), and the railroad bank culvert ~0.2 river miles south of Tremont Street in Duxbury (passage score of 4—restricted passage) also affecting rainbow smelt. It should be noted that a new fishway was installed at the Mill Pond Dam in 2007 as well as maintenance at the Island Creek Pond outlet control. Based on the current obstructions, however, the Aquatic Life Use is assessed as impaired for Island Creek Pond (Assessment Unit MA94073).

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	The generic "Non-Native Aquatic Plants" is not needed since the specific macrophyte Cabomba caroliniana (fanwort) has been utilized.

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

The non-native aquatic species, *Cabomba caroliniana*, was noted during the 1996 DWM synoptic survey (MassDEP 1996). The generic "Non-Native Aquatic Plants" is not needed since the specific macrophyte *Cabomba caroliniana* (fanwort) has been utilized.

Island Pond (MA94074)

Location:	[west of the locality of Cedarville] Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	52 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Fully Supporting
The Town of Plymouth's deep hole depth profile data collected in Island Pond on 16 September 2015 documented good conditions. Oxygen concentrations were good at all depths (DO minimum 6.9 mg/L), and both chlorophyll a and total phosphorus concentrations were very low (≤1.55µg/L and 0.008 mg/L, respectively). Secchi disk depth was very good (3.2m). The Aquatic Life Use for Island Pond is assessed as fully supporting based on these data.

Island Pond (MA94075)

Location:	[locally known as Great Island Pond] Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	80 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added
4c	4c	(Non-Native Aquatic Plants*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
Evaluation of the Town of Plymouth's deep hole depth profile data collected in Island Pond during the summer of 2015, did not identify any water quality concerns. There was no documentation of any oxygen depletion at depth (DO minimum 7.9mg/L during 17 September 2015 profile). Total phosphorus and chlorophyll a data were both indicative of good conditions. Total phosphorus concentrations were very low at both the surface and at depth (0.008mg/L) as chlorophyll a concentrations were very low (both <2.5 µg/L). Secchi disk depth was excellent (4.2m). However, the Aquatic Life Use is assessed as not supporting in Island Pond based on the presence of the non-native aquatic macrophyte *Cabomba caroliniana*.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	The generic "Non-Native Aquatic Plants" is not needed since the specific macrophyte Cabomba caroliniana (fanwort) has been utilized.

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

The non-native aquatic species, *Cabomba caroliniana*, was noted during the 1996 DWM synoptic survey (MassDEP 1996). The generic "Non-Native Aquatic Plants" impairment is not needed since the specific macrophyte *Cabomba caroliniana* (fanwort) has been utilized.

Island Pond (MA94076)

Location:	[south of locality of South Pond] Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	12 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for Island Pond

Jacobs Pond (MA94077)

Location:	Norwell.
AU Type:	FRESHWATER LAKE
AU Size:	61 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added
4c	4c	(Fish Passage Barrier*)		Added

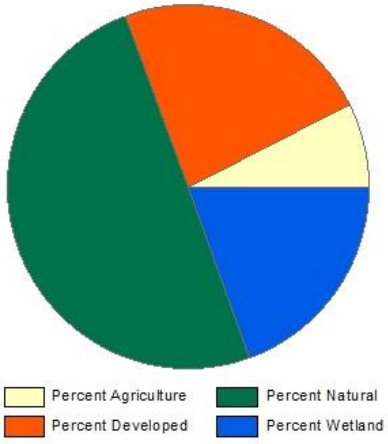
Fish, other Aquatic Life and Wildlife Use: Not Supporting
In addition to very dense infestations of two non-native aquatic species, *Myriophyllum heterophyllum* and *Cabomba caroliniana*, barriers to diadromous fish passage impair the Aquatic Life Use for Jacobs Pond. The four remaining barriers include the Peterson Pond Dam and the Upper Peterson Pond Dam (passage scores for both =5) owned by the Hanover Mall, the Route 123 culvert (state owned road) and the Jacobs Pond Dam, owned by the Town of Norwell (passage scores for both =10) (Chase 2017). Based on these obstructions and the non-native aquatic macrophyte species, the Aquatic Life Use is assessed as impaired for Jacobs Pond (Assessment Unit MA94077).

Jones River (MA94-12)

Location:	Headwaters, outlet Silver Lake, Kingston to former dam (NATID: MA00396) near Wapping Road, Kingston.
AU Type:	RIVER
AU Size:	4.1 MILES
Classification/Qualifier:	B: WWF, HQW

Jones River - MA94-12

Watershed Area: 17.57 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	17.56	11.56	6.95	4.46
Agriculture	7.5%	8.1%	14%	14.3%
Developed	23.2%	24.5%	13.1%	12.7%
Natural	49.8%	46.6%	42.8%	40.6%
Wetland	19.6%	20.8%	30.1%	32.4%
Impervious Cover	9.5%			

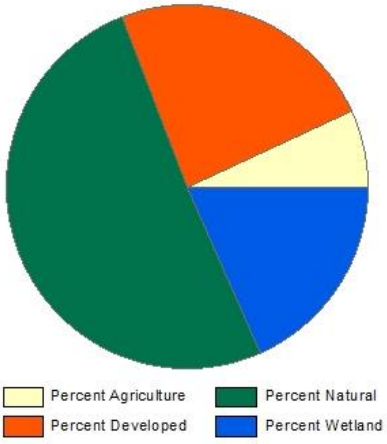
Fish, other Aquatic Life and Wildlife Use: Not Supporting
There are three barriers along the upper end of the Jones River in Kingston that do not allow passage of river herring and American eel into Silver Lake: the natural sand berm at the Silver Lake outlet, i.e., at the point of discharge to Forge Pond (passage score of 7- severe impediment), the Forge Pond (aka Brockton) Dam, located just upstream of Lake Street (passage score of 10—no possible passage), and the Lake Street culvert (passage score of 5 – restricted passage). At the downstream end of this segment of the Jones River the Wapping Road Dam was removed in the fall of 2011. The Wapping Road dam removal project cost ~$450,000. Major project partners included NOAA, the Jones River Watershed Association, Massachusetts Department of Fish and Game's Division of Ecological Restoration (MA DER) and Division of Marine Fisheries (MA DMF), the Mass Environmental Trust and the US Fish and Wildlife Service (USFWS). The lack of streamflow also continues to be a chronic problem for this segment of the Jones River as well as the extremely low DO/saturation conditions both of which were documented in the upper reach of this AU in the Forge Pond impoundment during the 2008/2009 survey (Chase 2013, Chase et al. 2013). These problems result from flow regulation/modification associated with water withdrawals in this segment (including but not necessarily limited to the out of basin transfer of water from Silver Lake to the City of Brockton for public water supply). Based on the lack of flow, the low DO, and the three obstructions to fish passage at the upper end of this segment of the Jones River (Assessment Unit MA94-12), the Aquatic Life Use is assessed as impaired.

Jones River (MA94-13)

Location:	From former dam (NATID: MA00396) near Wapping Road, Kingston to dam (NATID: MA00395) at Elm Street, Kingston.
AU Type:	RIVER
AU Size:	0.9 MILES
Classification/Qualifier:	B: WWF

Jones River - MA94-13

Watershed Area: 20.08 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	20.07	10.26	7.84	3.95
Agriculture	6.8%	7.6%	13.1%	13.8%
Developed	24%	27.7%	13.2%	13.7%
Natural	50.7%	47.6%	44.7%	44.6%
Wetland	18.4%	17.1%	29%	27.9%
Impervious Cover	9.8%			

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The existing fishway at the Elm Street Dam in Kingston allows passage of river herring and American eel (passage score 3 = a minor obstruction). A preliminary assessment for dam removal, however, is currently underway. At the upstream end of this segment of the Jones River the Wapping Road Dam was removed in the fall of 2011. The Wapping Road dam removal project cost ~$450,000. Major project partners included NOAA, the Jones River Watershed Association, Massachusetts Department of Fish and Game's Division of Ecological Restoration (MA DER) and Division of Marine Fisheries (MA DMF), the Mass Environmental Trust and the US Fish and Wildlife Service (USFWS). There is no impairment for diadromous fish passage for the Jones River Assessment Unit MA94-13. No other data have been collected in this portion of the Jones River so the low DO and low flow alteration impairments are being carried forward. It should also be noted here that the Elm Street Dam Removal Project proposed by the Jones River Watershed Association on behalf of the town of Kingston (EEA Project# 15902) is making its way through the permitting process. JRWAs partners include the Massachusetts Division of Ecological Restoration (DER) as well as NOAA and this project is part of a larger effort to improve the quality of water and aquatic habitat in the Jones River.

Jones River (MA94-14)

Location:	From dam (NATID: MA00395) at Elm Street, Kingston to mouth at Kingston Bay, Kingston.
AU Type:	ESTUARY
AU Size:	0.09 SQUARE MILES
Classification/Qualifier:	SA: SFO

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	5	Fish Bioassessments		Added
4a	5	Nutrient/Eutrophication Biological Indicators		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

Water quality and benthic macroinvertebrate sampling was conducted by MassDEP biologists in the upper reach of this Jones River AU just downstream from the Elm Street Dam in the summer of 2006. The water quality data (DO, pH, temperature, and nutrients) were indicative of good conditions (minimum DO 7.1mg/L, maximum temperature 25.2°C, average total phosphorus concentration 0.0438mg/L). The RBPIII analysis of the benthic macroinvertebrate sample was slightly impacted (65% comparable) when compared to the reference station. While these data were indicative of generally good conditions, subsequent data collected by DMF biologists documented habitat degradation associated with dense growths of filamentous green algae and instream aquatic macrophytes (potential infestation of M. heterophyllum that will need confirmation when flowering heads are present) during late spring in 2008 and 2009. Also because of the sharp declines in the smelt population of the Jones River noted by DMF biologists, the Aquatic Life Use is being assessed as not supporting. It should also be noted here that the Elm Street Dam Removal Project proposed by the Jones River Watershed Association on behalf of the town of Kingston (EEA Project# 15902) is making its way through the permitting process. JRWAs partners include the Massachusetts Division of Ecological Restoration (DER) as well as NOAA and this project is part of a larger effort to improve the quality of water and aquatic habitat in the Jones River.

Keene Pond (MA94079)

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

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for Keene Pond.

Lily Pond (MA94179)

Location:	Cohasset.
AU Type:	FRESHWATER LAKE
AU Size:	50 ACRES
Classification/Qualifier:	A: PWS, ORW

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Curly-leaf Pondweed*)		Added
5	5	(Fanwort*)		Added
5	5	(Fish Passage Barrier*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
Fish barriers have been addressed that had affected passage into Lily Pond: Culvert reconstruction at the Beechwood Street Dam was conducted in 2016. DMF scores passage =3 and notes the site/fishway design will be limited by water supply operations and the Hunters Pond Dam in Scituate and Cohasset, Massachusetts was removed between July and September 2017. Three non-native aquatic have been documented in Lily Pond: fanwort (*Cabomba caroliniana*), variable watermilfoil (*Myriopyllum heterophyllum*) and curly-leaved pondweed (*Potamogeton crispus*) so the Aquatic Life Use is assessed as not supporting.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Fish Passage Barrier	Applicable WQS attained, due to restoration activities	Two projects have improved habitat in this watershed area: Culvert reconstruction at the Beechwood Street Dam was conducted in 2016. DMF scores passage =3 and notes the site/fishway design will be limited by water supply operations and the Hunters Pond Dam in Scituate and Cohasset, Massachusetts was removed between July and September 2017. The spillway was notched to ensure a gradual release of water from the impoundment, letting Bound Brook flow free again after being dammed for centuries. As the first barrier upstream from the Atlantic Ocean, the dam's removal restores 5-miles of river spawning ground and habitat for alewife, blueback herring, American eel, rainbow smelt, sea lamprey and other important species. The project was funded by grants from the Massachusetts Department of Ecological Restoration and the NOAA and included many other project partners including the Town of Scituate, Princeton Hydro, T Ford Company, and the U.S. Fish and Wildlife Service (http://scituate.wickedlocal.com/news/20170901/hunters-pond-dam-dam-removal-paves-way-for-improvements and http://www.princetonhydro.com/blog/dam-removal/.

Supporting Information for Delisted Impairments

Fish Passage Barrier

According to DMF biologists (Chase 2016, Chase 2017) two projects have improved diadromous fish habitat in this subwatershed area:

1. Culvert reconstruction at the Beechwood Street Dam was conducted in 2016. DMF scores passage =3 and notes the site/fishway design will be limited by water supply operations.

2. The Hunters Pond Dam in Scituate and Cohasset, Massachusetts was removed between July and September 2017. The spillway was notched to ensure a gradual release of water from the impoundment, letting Bound Brook flow free again after being dammed for centuries. As the first barrier upstream from the Atlantic Ocean, the dam's removal restores 5-miles of river spawning ground and habitat for alewife, blueback herring, American eel, rainbow smelt, sea lamprey and other important species. The project was funded by grants from the Massachusetts Department of Ecological Restoration and the NOAA and included many other project partners including the Town of Scituate, Princeton Hydro, T Ford Company, and the U.S. Fish and Wildlife Service (http://scituate.wickedlocal.com/news/20170901/hunters-pond-dam-dam-removal-paves-way-for-improvements and http://www.princetonhydro.com/blog/dam-removal/

Little Harbor (MA94-20)

Location:	Cove south of Nichols Road, west of Atlantic Avenue, and north of Cohasset center, Cohasset.
AU Type:	ESTUARY
AU Size:	0.24 SQUARE MILES
Classification/Qualifier:	SA: SFO

Fish, other Aquatic Life and Wildlife Use: Insufficient Information
Between December 2004 and January 2009 water was collected from the outlet of Little Harbor at the Atlantic Avenue (Cunningham) Bridge in Cohasset for use as dilution water in the Cohassett WWTP's WET tests. Survival of both *A. bahia* (n=18) and *M. beryllina* (n=19) exposed (48 hour) to Little Harbor water has been excellent (≥93%) (MassDEP undated). Too limited data however to assess the Aquatic Life Use.

Little Herring Pond (MA94082)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	81 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)
Evaluation of the Town of Plymouth's "deep hole" data (this pond is described as extremely shallow) collected in Little Herring Pond during the summers of 2014, 2015, 2016, and 2017 documented generally good water quality conditions (the single DO measurement was good at 9.7 mg/L, chlorophyll a concentrations were low ranging from 0.8 to 9.54 µg/L during these surveys, the seasonal averages of total phosphorus were ≤ 0.025 mg/L with the exception of the single August 2014 sample (0.042 mg/L)). One of the two Secchi disk depths was slightly low (1.1m) but may also have been at the bottom (there was no record of max depth). The Aquatic Life Use is assessed as fully supporting for Little Herring Pond based on the Town of Plymouth's limited data that were collected during the summers of 2014 through 2017. While sufficient diadromous fish passage currently exists, the alert status will be kept since this herring run is such an important resource in the region and the weir and pool fishway at the canal Motel has good passage now but is aging and will need attention soon.

Little Pond (MA94182)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	40 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Fully Supporting
The Town of Plymouth's deep hole depth profile data collected in Little Pond on 9 September 2014 documented good conditions. Oxygen concentrations were good at all depths (DO minimum 6.7 mg/L), and both chlorophyll a and total phosphorus concentrations were very low (≤1.82µg/L and 0.002 mg/L, respectively). Secchi disk depth was very good (6.4m). The Aquatic Life Use for Little Pond is assessed as fully supporting based on these data.

Little Sandy Bottom Pond (MA94085)

Location:	Pembroke.
AU Type:	FRESHWATER LAKE
AU Size:	56 ACRES
Classification/Qualifier:	A: PWS, ORW (Tributary)

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed.

Little South Pond (MA94087)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	63 ACRES
Classification/Qualifier:	A: PWS, ORW

Fish, other Aquatic Life and Wildlife Use: Fully Supporting
The Town of Plymouth's deep hole depth profile data collected in Little South Pond on 9 September 2014 documented good conditions. Oxygen concentrations were good at all depths (DO minimum 8.7 mg/L), and both chlorophyll a and total phosphorus concentrations were very low (≤0.98µg/L and 0.017 mg/L, respectively). Secchi disk depth was very good (4.9m). The Aquatic Life Use for Little South Pond is assessed as fully supporting based on these data.

Long Island Pond (MA94088)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	33 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added

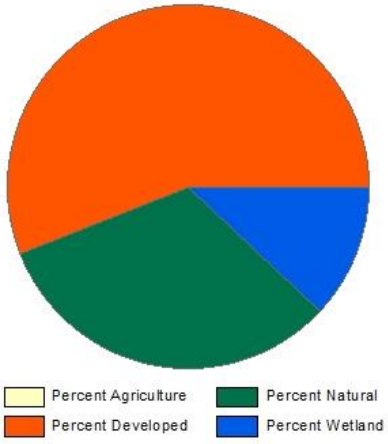
Fish, other Aquatic Life and Wildlife Use: Not Supporting (Alert)
Evaluation of the Town of Plymouth's deep hole depth profile data collected on 28 August 2014 documented good oxygen concentrations to a depth of 4.0m (≥5.1 mg/L) in Long Island Pond. DO was somewhat depleted at the 5.0m depth (3.2mg/L). The very dated (1970's era) bathymetric data is not sufficient to estimate the lake surface area exhibiting oxygen depletion. Total phosphorus concentrations were very low (0.005mg/L) in the bottom sample and below the recommended guideline of 0.025mg/L. Secchi disk depth was okay (2.75m). The Aquatic Life Use is assessed as not supporting, however, based on the presence of the non-native aquatic macrophytes *Cabomba caroliniana* and *Myriophyllum heterophyllum* in Long Island Pond. Low DO near the bottom is identified with an Alert.

LONGWATER BROOK (MA94-39)

Location:	Headwaters, south of Route 3, Norwell to mouth at confluence with Drinkwater River, Hanover.
AU Type:	RIVER
AU Size:	2.8 MILES
Classification/Qualifier:	B

Longwater Brook - MA94-39

Watershed Area: 2.97 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.97	2.97	0.77	0.77
Agriculture	0.6%	0.6%	0.5%	0.5%
Developed	55.7%	55.7%	43%	43%
Natural	31.7%	31.7%	34.8%	34.8%
Wetland	11.9%	11.9%	21.6%	21.6%
Impervious Cover	18.6%			

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No recent data are available to assess the status of the Aquatic Life Use for Longwater Brook.

Lorings Bogs Pond (MA94089)

Location:	Duxbury.
AU Type:	FRESHWATER LAKE
AU Size:	33 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Aquatic Life Use for Lorings Bog Pond is assessed as not supporting based on the infestation of the non-native aquatic macrophyte *Myriophyllum heterophyllum* that was noted during the 1996 DWM synoptic survey.

Lout Pond (MA94090)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	18 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)
Evaluation of the Town of Plymouth's deep hole depth profile data collected on 24 September 2015 documented good oxygen concentrations to a depth of 7.0m (≥5.1 mg/L) in Lout Pond. DO was somewhat depleted at greater depths (3.5mg/L at 10m) representing an estimated 20% of the lake surface area. Chlorophyll a concentrations were low throughout the water column (≤2.59µg/L) and Secchi disk depth was good (5m). Total phosphorus concentrations were fairly low in the upper water column (≤0.011µg/L) and below the recommended guideline of 0.025 mg/L, but were much higher near the bottom (0.5mg/L). The Aquatic Life Use is assessed as fully supporting for Lout Pond but is identified with an Alert Status because of low DO near the bottom and evidence of total phosphorus release from sediments.

Lower Chandler Pond (MA94091)

Location:	Duxbury/Pembroke.
AU Type:	FRESHWATER LAKE
AU Size:	37 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added
4c	4c	(Non-Native Aquatic Plants*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Aquatic Life Use for Lower Chandler Pond is assessed as not supporting based on the presence of the non-native aquatic macrophyte species *Cabomba caroliniana.*

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	The generic "Non-Native Aquatic Plants" is not needed since the specific macrophyte Cabomba caroliniana (fanwort) has been utilized.

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

Lower Chandler Pond has an infestation of the non-native aquatic macrophyte species *Cabomba caroliniana* (MassDEP 1996 and Mattson and Haque 2004). The generic "Non-Native Aquatic Plants" impairment is not needed since the specific macrophyte *Cabomba caroliniana* (fanwort) has been utilized.

Maquan Pond (MA94096)

Location:	Hanson.
AU Type:	FRESHWATER LAKE
AU Size:	45 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for Maquan Pond.

Morey Hole (MA94102)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	22 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)
Evaluation of the Town of Plymouth's deep hole depth profile data collected on 21 August 2014 documented good oxygen concentrations to a depth of 3.0m (≥7.4 mg/L) in Morey Hole. DO was depleted at the 3.5m depth (0.5mg/L). The very dated (1970's era) bathymetric data is not sufficient to estimate the lake surface area exhibiting oxygen depletion. Total phosphorus concentrations were very low (0.008 mg/L) at both the surface and bottom and below the recommended guideline of 0.025 mg/L. Chlorophyll a concentrations were also very low (≤1.4 µg/L) during this survey. Secchi disk depth was at the bottom (3.85m). The Aquatic Life Use is assessed as fully supporting for Morey Hole but is identified with an Alert Status because of low DO near the bottom

MUSQUASHCUT BROOK (MA94-64)

Location:	Headwaters outlet Musquashcut Pond, Scituate to mouth at confluence with The Gulf, Scituate.
AU Type:	ESTUARY
AU Size:	0.02 SQUARE MILES
Classification/Qualifier:	SA: SFO

Fish, other Aquatic Life and Wildlife Use: Insufficient Information
The presence of the tidegate restricts passage of river herring into Musquashcut Pond, however this is an example of where tidal flow restoration would be good for the aquatic health of the system but will push the salinity in the pond into a range that won't attract river herring spawning. Therefore fish passage barrier will not be identified as a cause of impairment for the *Aquatic Life Use* for either Musquashcut Pond or Musquashcut Brook.

Musquashcut Pond (MA94-33)

Location:	Scituate (formerly reported as 2004 segment: Musquashcut Pond MA94105).
AU Type:	ESTUARY
AU Size:	0.11 SQUARE MILES
Classification/Qualifier:	SA: SFO

Fish, other Aquatic Life and Wildlife Use: Not Supporting
No recent data so keep same impairments. Impaired conditions were documented during the MassDEP summer of 2001 survey (see details in MassDEP 2006).

North Hill Marsh Pond (MA94109)

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

Fish, other Aquatic Life and Wildlife Use: Not Assessed (Alert)
No data are available so the Aquatic Life Use is not assessed for North Hill Marsh Pond. The Alert Status is being maintained because of the potential infestation with a non-native aquatic macrophyte *Myriophyllum* (potentially *heterophyllum*) which needs to be identified when flowering heads are present.

North River (MA94-05)

Location:	Headwaters, confluence of Indian Head River and Herring Brook, Hanover/Pembroke to Route 3A, Marshfield/Scituate.
AU Type:	ESTUARY
AU Size:	0.3 SQUARE MILES
Classification/Qualifier:	SA: ORW, SFO

Fish, other Aquatic Life and Wildlife Use: Insufficient Information (Alert)
Water quality sampling was conducted by MassDEP biologists in the upper reach of this North River AU at the Route 53/139 bridge in Hanover/Pembroke (W0917) in the summer of 2006. With the exception of dissolved oxygen, water quality conditions were indicative of good conditions (maximum temperature 28.6°C, good pH, average total phosphorus concentration 0.06mg/L). The dissolved oxygen concentrations, however, ranged from 3.9 to 8.2mg/L and were frequently lower than 6.0mg/L (Class SA criteria). The median concentration was 6.3mg/L. Given that the sampling station was located in the very upper reach of this North River AU and the watershed is also highly influenced by wetlands, it is best professional judgement that there is insufficient information to assess the Aquatic Life Use but it is identified with an Alert Status because of low DO.

North River (MA94-06)

Location:	Route 3A, Marshfield/Scituate to confluence with South River/Massachusetts Bay, Marshfield/Scituate.
AU Type:	ESTUARY
AU Size:	0.54 SQUARE MILES
Classification/Qualifier:	SA: SFO

Fish, other Aquatic Life and Wildlife Use: Insufficient Information
Although survival of test organisms *M. beryllina* exposed (~7 day) and *A. bahia* exposed (48-hour) to water collected at the US Air Force Reservation beach on Fourth Cliff (at the end of Central Avenue) in Scituate has almost always been good, samples were collected as close to high tide as possible prior to the start of the outgoing tide making them more representative of conditions in Mass Bay rather than South or North River conditions. Therefore there is insufficient information to assess the Aquatic Life Use for the North River AU MA94-06.

North Triangle Pond (MA94110)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	22 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Fully Supporting
Water quality monitoring data collected on 9 September 2014 at the deep hole in North Triangle Pond documented good DO at depth (6.75 mg/L), low chlorophyll a concentrations (1.38 µg/L), and low total phosphorus concentrations (0.02 mg/L near bottom). Secchi disc depth was at the bottom (2.5m). Based on these limited data the Aquatic Life Use is assessed as fully supporting for North Triangle Pond.

Old Oaken Bucket Pond (MA94113)

Location:	Scituate.
AU Type:	FRESHWATER LAKE
AU Size:	9 ACRES
Classification/Qualifier:	A: PWS, ORW

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Fanwort*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
While adequate diadromous fish passage now exists into Old Oaken Bucket Pond, there are two non-native aquatic macrophyte species, *Cabomba caroliniana* and *Myriophyllum heterophyllum*, that have been documented so the Aquatic Life Use is assessed as not supporting. The total phosphorus impairment is being maintained without newer data to evaluate.

Oldham Pond (MA94114)

Location:	Pembroke/Hanson.
AU Type:	FRESHWATER LAKE
AU Size:	232 ACRES
Classification/Qualifier:	A: PWS, ORW (Tributary)

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Eurasian Water Milfoil, Myriophyllum Spicatum*)		Added
5	5	(Non-Native Aquatic Plants*)		Removed
5	5	(Non-Native Fish/Shellfish/Zooplankton*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Aquatic Life Use is assessed as not supporting for Oldham Pond because it is infested with *M. spicatum* and more recently with Asian clam (*Corbicula fluminea*).

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	The generic "Non-Native Aquatic Plants" is not needed since the specific macrophyte "Eurasian water milfoil (Myriophyllum spicatum) has been utilized.

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

Oldham Pond is infested with *M. spicatum* (BEC 1993). More recently (2007) an Asian clam (*Corbicula fluminea*) infestation has been reported (MassDEP undated). The generic "Non-Native Aquatic Plants" impairment is not needed since the specific macrophyte "Eurasian water milfoil (*Myriophyllum spicatum*) has been utilized.

Pembroke Street South Pond (MA94117)

Location:	Kingston.
AU Type:	FRESHWATER LAKE
AU Size:	6 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added
4c	4c	(Non-Native Aquatic Plants*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Aquatic Life Use is assessed as not supporting for Pembroke Street South Pond based on the presence of the non-native aquatic macrophyte *Cabomba caroliniana* documented during the 1996 synoptic survey.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	The generic "Non-Native Aquatic Plants" is not needed since the specific macrophyte Cabomba caroliniana (fanwort) has been utilized.

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

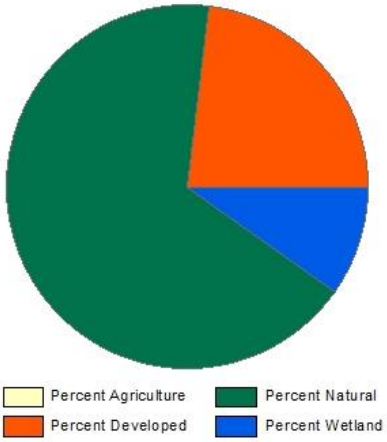
The non-native aquatic species, *Cabomba caroliniana*, was noted during the 1996 DWM synoptic survey (MassDEP 1996). The generic "Non-Native Aquatic Plants" impairment is not needed since the specific macrophyte *Cabomba caroliniana* (fanwort) has been utilized.

PHILIPS BROOK (MA94-48)

Location:	Headwaters north of the Summer Street/Cross Street intersection, Duxbury to the inlet of Northwest Duxbury Pond, Duxbury.
AU Type:	RIVER
AU Size:	0.8 MILES
Classification/Qualifier:	B

PHILIPS BROOK - MA94-48

Watershed Area: 0.48 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.48	0.48	0.13	0.13
Agriculture	0.4%	0.4%	0%	0%
Developed	23%	23%	10.9%	10.9%
Natural	66.8%	66.8%	55.4%	55.4%
Wetland	9.8%	9.8%	33.6%	33.6%
Impervious Cover	9.6%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting
The Aquatic Life Use is assessed as support for Philips Brook based on the presence of a reproducing eastern brook trout population documented in one DFG fish community samples collected in August 2011.

Pine Lake (MA94120)

Location:	Duxbury.
AU Type:	FRESHWATER LAKE
AU Size:	22 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for Pine Lake.

Pine Street Pond (MA94121)

Location:	Duxbury.
AU Type:	FRESHWATER LAKE
AU Size:	14 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for Pine Street Pond.

Plymouth Bay (MA94-17)

Location:	The waters southeast of a line drawn from Saquish Head to the tip of Plymouth Beach, Plymouth and west of a line from Gurnet Point to Rocky Point, Plymouth.
AU Type:	ESTUARY
AU Size:	10.3 SQUARE MILES
Classification/Qualifier:	SA: SFO

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)
The Aquatic Life Use is assessed as fully supporting for Plymouth Bay based on the eelgrass bed habitat data. While there was an increase between 1995 and 2013, there was a decrease (~9.5%) between 1995 and 2017 so this use is being identified with an Alert Status.

Plymouth Harbor (MA94-16)

Location:	The waters south of a line drawn from the tip of Plymouth Beach to High Cliff, Plymouth.
AU Type:	ESTUARY
AU Size:	2.53 SQUARE MILES
Classification/Qualifier:	SA: SFO

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Estuarine Bioassessments		Added
5	5	Nutrient/Eutrophication Biological Indicators		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
Survival of *M. beryllina* exposed (~7 day) to harbor water collected at the opening in the Plymouth Breakwater/jetty footbridge at high tide near the Plymouth Harbor boat ramp between April 2004 and April 2018 has been ≥80% (n=50) while survival of *A. bahia* exposed (48 hours) to the harbor water (n=42) has been ≥90%. Additionally, with the exception of one test (July 2006), the Plymouth WWTP facility has been in compliance with their whole effluent acute and chronic permit limits. The Aquatic Life Use, however, is assessed as not supporting for Plymouth Harbor based on the eelgrass bed habitat data. While there was a very small increase between 1995 and 2013, there was a large decrease (~28%) between 1995 and 2017.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Nutrient/Eutrophication Biological Indicators	Clarification of listing cause	This impairment code is being remapped to estuarine bioassessment which is used for eelgrass bed habitat loss.

Supporting Information for Delisted Impairments

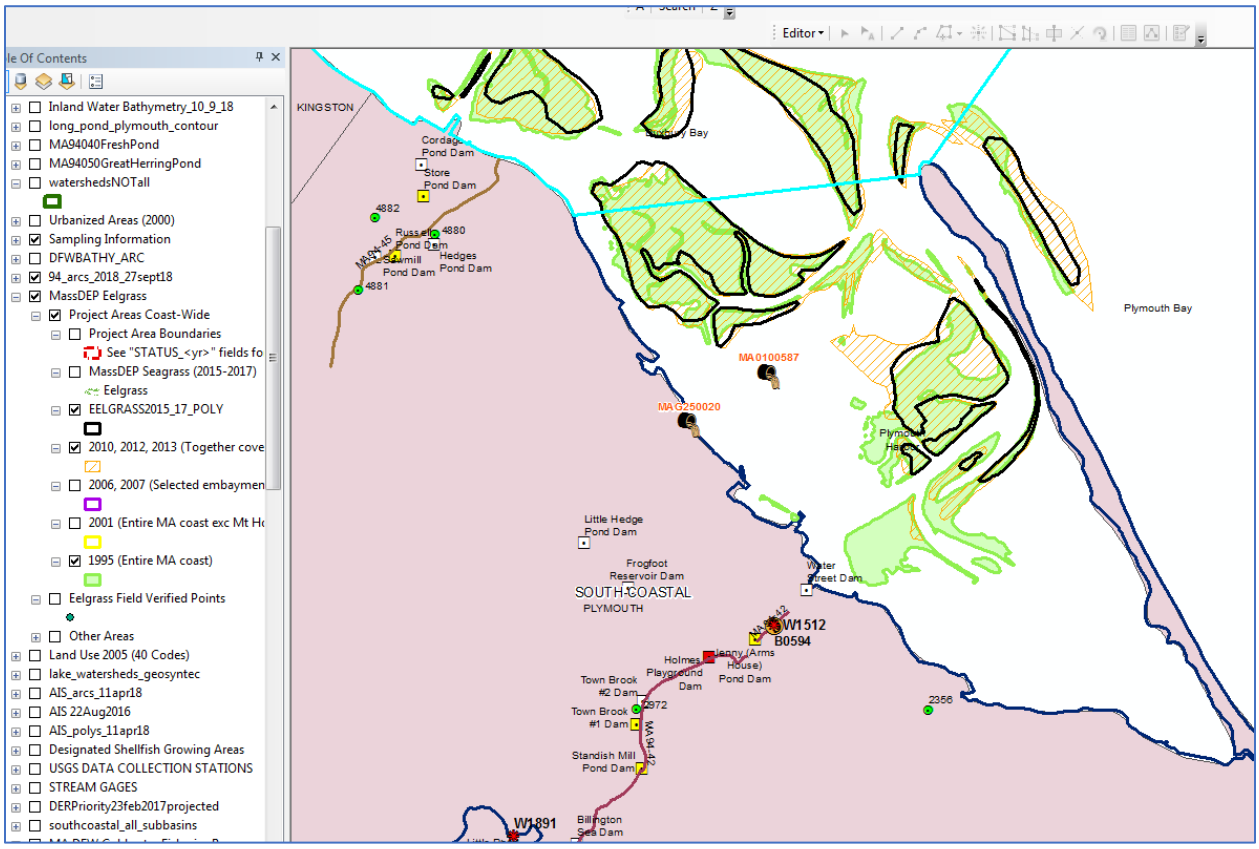
Nutrient/Eutrophication Biological Indicators

Analysis of MassDEP Eelgrass Mapping Project datalayers (MassGIS 2018) for the Plymouth Harbor AU is as follows:

Segment	Segment Name	Segment Area (sq. miles)	1995 Eelgrass Area (sq.	1995 Eelgrass Percent	2001 Eelgrass Area (sq. miles)	2001 Eelgrass Percent	2006/2007 Eelgrass Area (sq. miles)	2006/2007 Eelgrass Percent	2010,2011,2012 Eelgrass Area	2010,2011,2012 Eelgrass Percent	2015to2017 Eelgrass Area	2015to2017 Eelgrass Percent	Percent Change 1995 to

			miles)										2017
MA94-16	Plymouth Harbor	2.53	0.494	19.5%	0.386	15.3%	0.503	19.9%	0.499	19.7%	0.356	14.1%	-27.9%

Screen capture GIS datalayers depicting eelgrass bed habitat in Plymouth Harbor (MassGIS 2018):



While there was a very small increase in eelgrass bed habitat between 1995 and 2013, there was a large decrease (~28%) between 1995 and 2017.

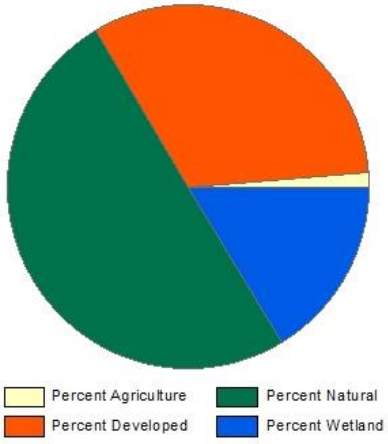
The “Nutrient/Eutrophication Biological Indicators” impairment code is being delisting since the “Estuarine Bioassessments” impairment is being added (a correction) for the eelgrass bed habitat loss.

PUDDING BROOK (MA94-60)

Location:	Headwaters, perennial portion, east of Hemlock Drive, Pembroke to inlet of Reservoir, southwest of Pleasant Street, Pembroke.
AU Type:	RIVER
AU Size:	2 MILES
Classification/Qualifier:	B

PUDDING BROOK - MA94-60

Watershed Area: 3.32 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.32	3.32	0.92	0.92
Agriculture	1.3%	1.3%	0.5%	0.5%
Developed	32.2%	32.2%	19.5%	19.5%
Natural	50.1%	50.1%	49.1%	49.1%
Wetland	16.4%	16.4%	30.9%	30.9%
Impervious Cover	15.6%			

Fish, other Aquatic Life and Wildlife Use: Not Assessed
Pudding Brook was sampled by MassDEP biologists in the summer of 2013 as part of the probabilistic wadeable river and stream survey. Survey data not all validated/available so the Aquatic Life Use is currently not assessed for Pudding Brook

Reeds Millpond (MA94126)

Location:	Kingston.
AU Type:	FRESHWATER LAKE
AU Size:	6 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added
4c	4c	(Non-Native Aquatic Plants*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Aquatic Life Use is assessed as not supporting for Reeds Milllpond based on the presence of the non-native aquatic macrophyte *Cabomba caroliniana* documented during the 1996 synoptic survey.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	The generic "Non-Native Aquatic Plants" is not needed since the specific macrophyte Cabomba caroliniana (fanwort) has been utilized.

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

The non-native aquatic species, *Cabomba caroliniana*, was noted during the 1996 DWM synoptic survey (MassDEP 1996). The generic "Non-Native Aquatic Plants" impairment is not needed since the specific macrophyte *Cabomba caroliniana* (fanwort) has been utilized.

Reservoir (MA94127)

Location:	Pembroke.
AU Type:	FRESHWATER LAKE
AU Size:	16 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Supporting
During the 1996 MassDEP synoptic survey, the dike at the Reservoir was blown out and the approximately 100 acres of formerly open water habitat was colonized mostly with terrestrial vegetation that included a few stands of emergents. It may be refilled on occasion for nearby cranberry bog operations (MassDEP 2006). Google Earth images available between August 2003 and April 2018 revealed similar conditions so the flow regime modification impairment is being maintained.

Reservoir (MA94186)

Location:	Scituate (formerly part of 2014 segment: First Herring Brook MA94-25).
AU Type:	FRESHWATER LAKE
AU Size:	63 ACRES
Classification/Qualifier:	A: PWS, ORW (Tributary)

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	4c	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
According to DMF biologists (Chase 2016 and 2017), the existing fishway at Reservoir Dam in Scituate which should allow passage of river herring and American eel has a passage rating of 9 (a severe impediment). Therefore, fish passage barrier will be added as an impairment for diadromous fish passage and the assessment units upstream from the Reservoir Dam.

Round Pond (MA94131)

Location:	Duxbury.
AU Type:	FRESHWATER LAKE
AU Size:	7 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for Round Pond.

Russell Millpond (MA94132)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	42 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Dissolved Oxygen		Added
5	5	(Fish Passage Barrier*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
Fish passage into Russell Millpond has improved. Evaluation of the Town of Plymouth's deep hole depth profile data collected on 19 August 2014 documented good oxygen concentrations to a depth of 2.0m (≥4.8 mg/L) in Russell Millpond but DO was depleted at the 3.0m depth (0.2mg/L) representing roughly 70% of the ponds surface area. Total phosphorus concentrations were slightly below the 0.025 mg/L guideline near the surface (0.018 mg/L) but were much higher (0.103mg/L) in the bottom sample. Secchi disk depth was marginal (1.43m) and chlorophyll a concentrations near the surface were 8.93µg/L. The Aquatic Life Use is assessed as not supporting for Russell Millpond because of the low DO below 2.0m. Insufficient data are available to delist the algae impairment so that is being retained.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Fish Passage Barrier	Applicable WQS attained, due to restoration activities	The fish ladder constructed at the Russell Millpond Dam in Plymouth in 2007 (FERC permit), operated under a fishway permit (2008), and an Operation and Maintenance Plan (2010), has improved diadromous fish habitat in this subwatershed area up into Russell Millpond.

Supporting Information for Delisted Impairments

Fish Passage Barrier

"Diadromous Fish Habitat: According to DMF biologists (Chase 2016 and 2017), the fishway at the Hayden Mill Pond Dam in Plymouth allow adequate passage of river herring and American eel (passage score = 1 - a minor obstruction). A fish ladder was constructed at the Russell Mill Pond Dam in Plymouth in 2007 (FERC permit) and is operated under a fishway permit (2008) and an Operation and Maintenance Plan (2010). Therefore, there is no longer impairment for diadromous fish passage up into Russell Millpond Assessment Unit MA94132."

Russell Pond (MA94133)

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

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	4c	(Fanwort*)		Added
3	4c	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

Russell Pond was documented to have an infestation of the non-native aquatic macrophyte species *Cabomba Caroliniana.* The other water quality data collected on 30 August 2005 were indicative of good conditions (good DO, pH, low chlorophyll a, low total phosphorus). The very old degraded existing fishway near the earthen dam downstream from Russell Pond in Kingston, however, does not allow sufficient passage (passage score of 6—restricted passage) for river herring and American eel along this unnamed Tributary and into Russell Pond. The exisiting fishways from Elm Street to Sylvia Place Road (passage score 3 = minor obstruction), at the Sylvia Place Pond Dam (also identified by the Bryant Mill Pond Dam) (passage score 1 = minor obstruction), and the Wildlands Trust stream weirs (passage score = 0) allow passage so are not considered problematic. However, based on the degraded fishway obstruction near the earthen dam downstream from Russell Pond in Kingston as well as the presence of the non-native aquatic macrophyte species *Cabomba Caroliniana*, the Aquatic Life Use is assessed as impaired for Russell Pond (Assessment Unit MA94133).

Savery Pond (MA94136)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	29 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Nutrient/Eutrophication Biological Indicators		Added
5	5	Phosphorus, Total		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

Savory Pond experienced two years with prolonged algal blooms (2011 and 2014). Evaluation of the Town of Plymouth's deep hole depth profile data collected in Savery Pond on 18 August 2014 indicated oxygen depletion at all depths (maximum DO 2.5mg/L). During this survey, the total phosphorus concentration was elevated (0.109mg/L) and the chlorophyll a concentration was somewhat high (14.6 µg/L). During the summers of 2015, 2016, and 2017 low DO conditions were measured only occasionally (5 of 16 surveys) at depths greater than 2.5 m (~8 feet) ranging from 1.4 – 3.8mg/L representing roughly 50% of the ponds surface area. Total phosphorus concentrations ranged from 0.02 to 0.1988mg/L and were typically above the 0.025mg/L recommended guideline while chlorophyll a concentrations ranged from 2.11 - 19.6µg/L (excluding the extremely high result reported at depth on 6 August 2015). Secchi disk depths ranged from 1.05 to 3.4m but were often ≤1.5m (n= 11 of 17 measurements). The Aquatic Life Use is assessed as not supporting for Savery Pond as a result of the evidence of nutrient enriched conditions (prolonged algal blooms, oxygen depletion at depth, elevated chlorophyll a, and limited transparency) and total phosphorus.

Scituate Harbor (MA94-02)

Location:	The waters west of a line across the mouth of Scituate Harbor, from the elbow of the jetty southeast off Lighthouse Point to the jetty northeast of the U.S. Coast Guard Station, Scituate.
AU Type:	ESTUARY
AU Size:	0.32 SQUARE MILES
Classification/Qualifier:	SA: SFO

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	5	Estuarine Bioassessments		Added

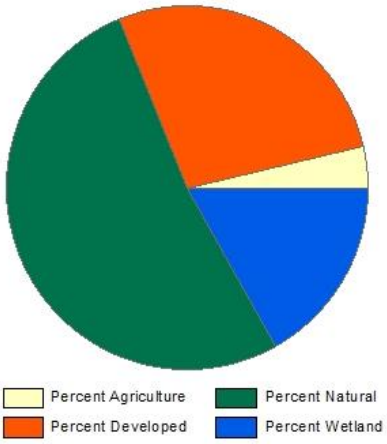
Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Aquatic Life Use is assessed as not supporting for Scituate Harbor based on MassDEP eelgrass mapping during the 1995 and 2010 to 2013 sampling periods. An estimated 0.013 square miles of eelgrass coverage was mapped in 2015-2017 which is less (~17%) than the eelgrass coverage found in 1995 (0.019 square miles.

Second Herring Brook (MA94-26)

Location:	Headwaters, outlet Turner Pond, Norwell (excluding the approximately 0.3 mile through Torrey Pond) to the tidal zone near a wooden walk bridge approximately 205 meters downstream from Second Herring Brook Pond Dam (NATID: MA02171), Norwell (area associated with North River Corridor designated as ORW).
AU Type:	RIVER
AU Size:	1.6 MILES
Classification/Qualifier:	B: ORW ("qualifier 'ORW' applies only to portion in North River Corridor")

Second Herring Brook - MA94-26

Watershed Area: 3.61 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.61	3.52	0.84	0.83
Agriculture	3.7%	3.8%	8.3%	8.3%
Developed	27.4%	26.7%	19.7%	19.5%
Natural	52.1%	52.2%	44.9%	44.9%
Wetland	16.9%	17.3%	27.1%	27.2%
Impervious Cover	7.2%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	4c	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
Although the benthic community in Second Herring Brook downstream from the Norris Pond Dam was considered good (RBP III analysis = 70% comparable or slightly impacted compared to control station), there are three barriers along Second Herring Brook in Norwell that do not allow passage of river herring and American eel: the Gordon Pond Dam (passage score of 4- restricted passage), the Norris Pond Dam (passage score of 10—no possible passage), and the Torrey Pond Dam (passage score of 10). Based on these obstructions, the Aquatic Life Use is assessed as impaired for Second Herring Brook (Assessment Unit MA94-26).

Second Herring Brook (MA94-31)

Location:	From the tidal zone near a wooden walk bridge approximately 205 meters downstream from the Second Herring Brook Pond Dam (NATID: MA02171), Norwell to mouth at confluence with the North River, Norwell.
AU Type:	ESTUARY
AU Size:	0.002 SQUARE MILES
Classification/Qualifier:	SA: ORW, SFO

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed.

Shallow Pond (MA94140)

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

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed.

Ship Pond (MA94142)

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

Fish, other Aquatic Life and Wildlife Use: Insufficient Information (Alert)
Too limited data are available to assess the Aquatic Life Use for Ship Pond. While the concentration of DO is good and total phosphorus and chlorophyll a concentrations were low during the Town of Plymouths monitoring at the "deep hole" conducted on 4 September 2014, the low transparency (Secchi disk depth only 1m) and estimates of supersaturated conditions may be indicative of enriched conditions. Therefore there is insufficient information to assess the use and poor transparency and some degree of supersaturation are identified with Alerts.

Silver Lake (MA94143)

Location:	Pembroke/Plympton/Kingston.
AU Type:	FRESHWATER LAKE
AU Size:	616 ACRES
Classification/Qualifier:	A: PWS, ORW

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	5	Dissolved Oxygen		Added
4c	5	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

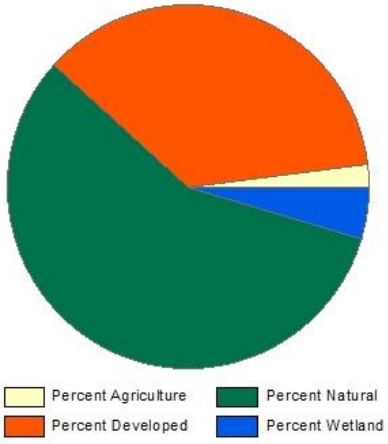
Because of periodic water shortages, the Massachusetts Legislature has allowed the City of Brockton to divert water from Monponsett Pond in the Taunton River Watershed and Furnace Pond in the North River Watershed into Silver Lake between October and May. Since both of these waterbodies are more enriched, their influence on water quality in Silver Lake is of concern. Brockton's Water Management Act (WMA) registration allows the withdrawal of 11.11 MGD from the three reservoirs. The Brockton Water Commission operates a water treatment facility on the shore of Silver Lake that is permitted (NPDES MAG640029) to discharge filter backwash and supernatant into a lagoon to Silver Lake. Water quality monitoring was conducted in Silver Lake during 2008 and 2009 as part of the river herring spawning and nursery habitat assessment (Chase et al. 2013). The maximum depth at station SL4 (the deep hole station) was reported to be 20.5 m. Oxygen depletion when stratified ranged between depths of 8 to 12 m during 2008 and 2009 profiles (very rough estimate of 40% of the lake surface area using 9m (30') contour). The maximum temperature was 27.15°C. The pH was often slightly acidic (generally ranging from 6.15 to 6.75SU) typical of naturally occurring conditions in this area. There were several measurements at depth during stratification when pH was as low as 5.65SU. Specific conductivity was low (highest measured was 189 uS/cm) and the Secchi disk depths were all good ranging from 2.4 to 3.1 m. Total phosphorus was not measured at the deep hole station SL4 but concentrations at the other three surface sampling locations in the lake were low (0.003 to 0.021 mg/L). There are three barriers along the upper end of the Jones River in Kingston that do not allow passage of river herring and American eel into Silver Lake: the natural sand berm at the Silver Lake outlet (passage score of 7- severe impediment), the Forge Pond Dam (passage score of 10—no possible passage), and the Lake Street culvert (passage score of 5 – restricted passage). Based on the flow alteration associated with water withdrawals and diversions, the three obstructions to fish passage into Silver Lake (Assessment Unit MA94143), and the oxygen depletion occurring at depths >9m, the Aquatic Life Use is assessed as impaired.

SMELT BROOK (MA94-54)

Location:	Headwaters outlet Smelt Pond, Kingston to tidal portion north of Route 3A, Kingston (through former 2016 segment: Foundry Pond MA94038).
AU Type:	RIVER
AU Size:	2.1 MILES
Classification/Qualifier:	B

SMELT BROOK - MA94-54

Watershed Area: 2.85 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.85	2.85	0.58	0.58
Agriculture	2%	2%	7.3%	7.3%
Developed	36.3%	36.3%	25.5%	25.5%
Natural	57.1%	57%	56.5%	56.5%
Wetland	4.7%	4.7%	10.7%	10.7%
Impervious Cover	20.8%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	5	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Foundry Pond Dam in Kingston does not allow passage (passage score of 10—no possible passage) for rainbow smelt and American eel along Smelt Brook. Based on this obstruction, the Aquatic Life Use is assessed as impaired for Smelt Brook (Assessment Unit MA94-54).

SMELT BROOK (MA94-56)

Location:	tidal portion north of Route 3A, Kingston to mouth at confluence with Jones River, Kingston.
AU Type:	ESTUARY
AU Size:	0.01 SQUARE MILES
Classification/Qualifier:	SA: SFO

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for Smelt Brook AU MA94-56.

Smelt Pond (MA94184)

Location:	Kingston.
AU Type:	FRESHWATER LAKE
AU Size:	45 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added
4c	4c	(Fish Passage Barrier*)		Added

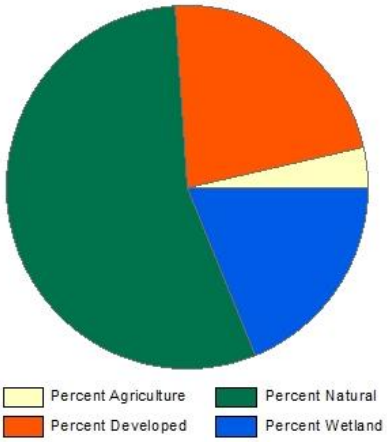
Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Foundry Pond Dam in Kingston does not allow passage (passage score of 10—no possible passage) for rainbow smelt and American eel along Smelt Brook and up into Smelt Pond. Based on this obstruction,as well as the infestation with two non-native aquatic macrophytes, C*abomba caroliniana* and *Myriophyllum heterophyllum,* the Aquatic Life Use is assessed as impaired for Smelt Pond (Assessment Unit MA94184).

South River (MA94-08)

Location:	Headwaters, outlet unnamed pond north of Congress Street, Duxbury to dam near Main Street (Route 3A), Marshfield (through former 2014 segment: South River Pond MA94148).
AU Type:	RIVER
AU Size:	4.9 MILES
Classification/Qualifier:	B: ORW

South River - MA94-08

Watershed Area: 11.41 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	11.41	8.25	3.32	2.45
Agriculture	3.5%	2.6%	8.7%	5.5%
Developed	22.6%	22%	13.5%	13.9%
Natural	55%	54.2%	42.6%	40.2%
Wetland	18.9%	21.3%	35.2%	40.4%
Impervious Cover	9.1%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	5	Dissolved Oxygen		Added
2	5	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting (Alert)

In-situ water quality data including DO, pH, temperature, and nutrient samples were collected at two stations in this AU of the South River in the summer of 2006. Similar to conditions previously documented during the 2001 survey, low DO, DO saturation and pH and somewhat elevated total phosphorus measurements (average 0.098, max 0.22mg/L) were documented at the upstream station (W0921) near Temple Street which is just below a very large wetland complex and the diel changes in DO at this station ranged from 0.93 to 3.7 mg/L. In August 2011, backpack electrofishing was conducted further downstream in the South River near Old Ocean Street in Marshfield. Here a total of 32 individuals representing six macrohabitat generalist species were collected with 28% of the fish considered moderately tolerant of pollution. At the downstream end of this AU at station (W1539) downstream from the Route 3A bridge generally good water quality conditions (DO, DO saturation, and pH) were documented and total phosphorus measurements were somewhat lower (0.079 average, max 0.1 mg/L) with little diel change in DO (0.36 to 0.71 mg/L). It should also be noted that just downstream from the dam that ends this AU, the RBP III analysis of a benthic macroinvertebrate sample collected in July 2006 was found to be indicative of generally good conditions (slightly impacted). According to DMF biologists (Chase 2016 and 2017), there are two barriers along this segment of the South River in Marshfield that do not allow passage of river herring and American eel: the Chandlers Pond west side Dam (passage score = 10 – no possible passage) and the Chandlers Pond Dam (passage

score =8 – severe impediment). Fish passage at the downstream end of this segment at the Veteran's Memorial Park Dam in Marshfield, is made possible with the existing fishway that was rebuilt in 2007 and improved by DMF in 2017 (new concrete entrance box). Based on the obstructions at Chandler Pond, however, the Aquatic Life Use is assessed as impaired for the South River (Assessment Unit MA94-08). Additionally, low DO is being identified as a cause of impairment based on the data collected in the South River near Temple Street which although is influenced by the large wetland complex is also influenced by cranberry bog operations. Similar to the prior assessment, the alert status for the somewhat elevated total phosphorus concentration is being maintained.

South River (MA94-09)

Location:	From dam near Main Street (Route 3A), Marshfield to mouth at confluence with North River/Massachusetts Bay, Marshfield/Scituate.
AU Type:	ESTUARY
AU Size:	0.63 SQUARE MILES
Classification/Qualifier:	SA: ORW, SFO

Fish, other Aquatic Life and Wildlife Use: Fully Supporting
Just upstream from this AU at station (W1539) downstream from the Route 3A bridge generally good water quality conditions (DO, DO saturation, and pH). Total phosphorus concentrations were slightly elevated (0.079 average, max 0.1 mg/L) however there were no observations of any dense/very dense growths of filamentous algae and little diel change in DO (0.36 to 0.71 mg/L). Additionally, the RBP III analysis of a benthic macroinvertebrate sample collected in July 2006 was found to be indicative of generally good conditions (slightly impacted) compared to the reference station. Survival of test organisms *M. beryllina* exposed (~7 day) and *A. bahia* exposed (48-hour) to water collected at the US Air Force Reservation beach on Fourth Cliff (at the end of Central Avenue) in Scituate has almost always been good, samples were collected as close to high tide as possible prior to the start of the outgoing tide making them more representative of conditions in Mass Bay rather than South or North River conditions. Based on these data the Aquatic Life Use for the South River AU MA94-09 is assessed as fully supporting.

South Triangle Pond (MA94149)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	17 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed (Alert)
No data are available so the Aquatic Life Use is not assessed for South Triangle Pond. The Alert Status for the potential infestation of a non-native aquatic macrophyte (*Myriophyllum* sp.) is being carried forward

Studleys Pond (MA94151)

Location:	Rockland.
AU Type:	FRESHWATER LAKE
AU Size:	25 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for Studleys Pond.

Tack Factory Pond (MA94152)

Location:	Scituate.
AU Type:	FRESHWATER LAKE
AU Size:	8 ACRES
Classification/Qualifier:	A: PWS, ORW (Tributary)

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	4c	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting (Alert)
According to DMF biologists (Chase 2016 and 2017), the existing fishway at Reservoir Dam in Scituate which should allow passage of river herring and American eel has a passage rating of 9 (a severe impediment). Therefore, fish passage barrier will be added as an impairment for diadromous fish passage for Tack Factory Pond Assessment Unit MA94152 and the assessment units upstream from the Reservoir Dam. A new alert issue is being added for elevated total phosphorus concentrations documented in First Herring Brook, which flows into Tack Factory Pond

The Gulf (MA94-19)

Location:	Headwaters, outlet Hunters Pond, Scituate to confluence with Cohasset Cove just north of Border Street, Cohasset.
AU Type:	ESTUARY
AU Size:	0.13 SQUARE MILES
Classification/Qualifier:	SB: SFR

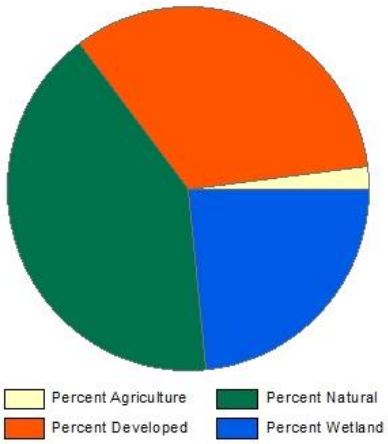
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for The Gulf.

Third Herring Brook (MA94-27)

Location:	Headwaters, outlet Jacobs Pond, Norwell/Hanover to mouth at confluence with North River, Norwell/Hanover (area associated with North River Corridor designated as ORW).
AU Type:	RIVER
AU Size:	5.3 MILES
Classification/Qualifier:	B: ORW ("qualifier 'ORW' applies only to portion in North River Corridor")

Third Herring Brook - MA94-27

Watershed Area: 10.33 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	10.33	6.41	2.48	1.88
Agriculture	2%	1.9%	2.4%	2.3%
Developed	33.2%	33.3%	21.4%	21.2%
Natural	41.3%	42.5%	38.1%	38.5%
Wetland	23.5%	22.4%	38.1%	38%
Impervious Cover	11.5%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	4c	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

The RPBIII status of the benthic macroinvertebrate sample collected in the summer of 2006 (B0601) from Third Herring Brook (~120m downstream from Broadway / River Street, Hanover / Norwell) was found to be 60% comparable (slightly impaired) when compared to the reference station (B0590). Backpack electrofishing at two stations in the brook in August and September 2013 documented fluvial dependent as well as moderately tolerant species. Water quality data collected at one station (W1509) near Broadway/River Street Bridge in Hanover/Norwell during the summer of 2006 were also indicative of good conditions (deployed probe data for DO and temperature, as well as pH measurements and grab samples analyzed for ammonia-nitrogen and total phosphorus concentrations). Although all of these data are indicative of good conditions, and the removal of the two most downstream dams (Tack Factory Pond Dam in December 2016 and Mill Pond Dam, near the South Shore YMCA, in October 2014), has restored some diadromous fish habitat, four barriers to diadromous fish passage remain along Third Herring Brook: the Peterson Pond Dam and the Upper Peterson Pond Dam (passage scores for both =5) owned by the Hanover Mall, the Route 123 culvert (state owned road) and the Jacobs Pond

Dam, owned by the Town of Norwell (passage scores for both =10) (Chase 2017). Based on these obstructions, the Aquatic Life Use is assessed as impaired for Third Herring Brook (Assessment Unit MA94-27).

Torrey Pond (MA94157)

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

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added
4c	4c	(Fish Passage Barrier*)		Added
4c	4c	(Non-Native Aquatic Plants*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Aquatic Life Use is assessed as not supporting based on the presence of the non-native aquatic macrophyte *Cabomba caroliniana* as well as the barriers to diadromous fish passage. According to DMF biologists (Chase 2016 and 2017), there are three barriers along Second Herring Brook in Norwell that do not allow passage of river herring and American eel into Torrey Pond: the Gordon Pond Dam (passage score of 4- restricted passage), the Norris Pond Dam (passage score of 10—no possible passage), and the Torrey Pond Dam (passage score of 10).

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	The generic "Non-Native Aquatic Plants" is not needed since the specific macrophyte Cabomba caroliniana (fanwort) has been utilized.

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

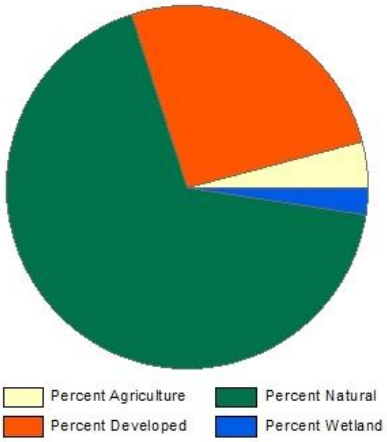
The non-native aquatic species, *Cabomba caroliniana*, was noted during the 1996 DWM synoptic survey (MassDEP 1996). The generic "Non-Native Aquatic Plants" impairment is not needed since the specific macrophyte *Cabomba caroliniana* (fanwort) has been utilized.

TOWN BROOK (MA94-42)

Location:	Headwaters, outlet Billington Sea, Plymouth to just upstream of the Route 3A bridge, Plymouth (excluding the approximately 0.07 mile through Arms House Pond).
AU Type:	RIVER
AU Size:	1.5 MILES
Classification/Qualifier:	B

Town Brook - MA94-42

Watershed Area: 8.99 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	8.97	6.43	2.1	1.72
Agriculture	4.1%	5.3%	15.4%	17.4%
Developed	25.9%	33.7%	15.6%	17.8%
Natural	67.7%	58.2%	62%	57.8%
Wetland	2.4%	2.9%	7%	7%
Impervious Cover	11.4%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	4c	(Curly-leaf Pondweed*)		Added
2	4c	(Non-Native Aquatic Plants*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

According to DMF biologists (Chase 2016 and 2017), MMI (2015 and 2017), and NOAA (2019) improvements (dam and/or weir removals, bridge replacements, a fish ladder, and a stream restoration project) have been implemented at all of the impediments to diadromous fish passage along Town Brook so there is no impairment for diadromous fish passage. Backpack electrofishing at one site in Town Brook in June 2008 off of Billington Street (SampleID: 2972), documented the presence of two fluvial specialist/dependant species of the 11 represented. Further downstream near the footbridge upstream from Summer Street/Pleasant Street in Plymouth the RBPIII analysis of the benthic macroinvertebrate sample (station B0594) collected in July 2006 by MassDEP biologists was found to be 65% comparable, "slightly impacted", when compared to the reference stream on the unnamed tributary upstream from Forge Pond in Plymouth. Furthermore, water quality data collected between June and September 2006 from the brook (W1512) documented very good conditions (minimum DO 7.08 mg/L, maximum temperature 27°C, no indication of enrichment based on diel changes, good pH, and average total phosphorus 0.041 mg/L). Infestations of two non-native aquatic macrophyte species, *Myriophyllum heterophyllum* and *Potamgetan crispus* were confirmed in Town Brook in 2017 (MassDEP

undated). While the water quality monitoring data (biological and physicochemical) were indicative of good conditions, because of the infestation by two non-native aquatic macrophytes the Aquatic Life Use is assessed as not supporting for Town Brook.

Triangle Pond (MA94160)

Location:	Plymouth.
AU Type:	FRESHWATER LAKE
AU Size:	14 ACRES
Classification/Qualifier:	B

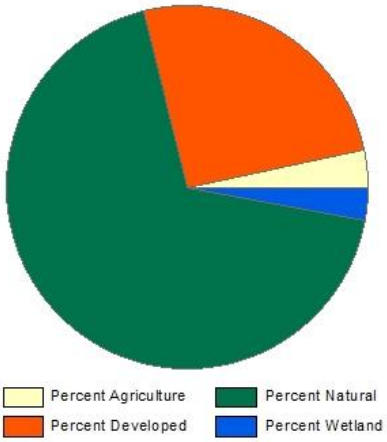
Fish, other Aquatic Life and Wildlife Use: Fully Supporting
The Town of Plymouth's deep hole depth profile data collected in Triangle Pond on 16 September 2015 documented good conditions. Oxygen concentrations were good at all depths (DO minimum 6.6 mg/L), and both chlorophyll a and total phosphorus concentrations were very low (≤2.31µg/L and ≤0.019 mg/L, respectively). Secchi disk depth was also near or at the bottom (4.63m). The Aquatic Life Use for Triangle Pond is assessed as fully supporting based on these data.

Unnamed Tributary (MA94-35)

Location:	Unnamed tributary to Eel River, from outlet cranberry bog south of Valley Road, Plymouth to mouth at confluence with Eel River, Plymouth (through former 2014 segment: Forge Pond MA94036).
AU Type:	RIVER
AU Size:	2.4 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA94-35

Watershed Area: 7.62 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	7.62	7.05	0.53	0.53
Agriculture	3.3%	3.5%	14.3%	14.3%
Developed	25.6%	25.7%	9.3%	9.3%
Natural	68.2%	67.6%	43.1%	43.1%
Wetland	2.9%	3.2%	33.4%	33.4%
Impervious Cover	9.8%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	4c	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

Benthic macroinvertebrate sampling was conducted at one station (B0590) in the upper reaches of this unnamed tributary (locally known as Shingle Brook) in July 2006. This site was used as the reference station for the RBPIII analysis so is considered to be not impacted. Fish sampling near this location (Sample ID: 1998) in August 2006 documented multiple age classes of eastern brook trout as well as slimy sculpin. Further downstream in the Forge Pond impoundment water quality monitoring was conducted by the Town of Plymouth volunteers. There was no evidence of oxygen depletion at any depth during the survey conducted in September 2014 and the chlorophyll a and total phosphorus data were generally low (maximum concentrations of 5.82 µg/L and 0.012 mg/L, respectively). Secchi disk depth was also good in the Forge Pond impoundments (3.0m). Just downstream from the Forge Pond dam, backpack electrofishing in September 2006 documented larger (stocked) brook and brown trout but most of the sample was comprised of moderately and tolerant macrohabitat generalists (Sample ID: 1999). Further downstream, the Howland Pond Dam (also known as the Clifford Road Dam) is a barrier to fish passage (passage score of 10—no possible passage) for river herring and American eel according to DMF biologists (Chase 2016 and 2017). Water quality sampling conducted during the summer of 2006 just downstream from this dam (W0333) was indicative of generally good conditions (minimum

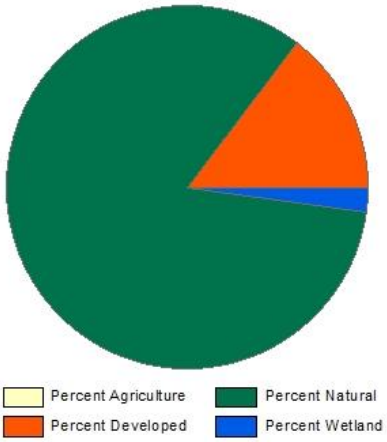
DO 5.6mg/L, maximum diel DO shift 2.6mg/L, highest saturation 114%, good pH, maximum temperature 27.1°C). The average and maximum total phosphorus concentrations were generally low (0.034 and 0.054 mg/L, respectively). There were no observations of dense or very dense filamentous algae noted.
The Aquatic Life Use is assessed as not supporting for this Unnamed Tributary based on the fish passage obstruction at the Howland Pond Dam. The former alert is being removed since taxa and EPT richness in the 2006 benthic sample were excellent (32 and 11, respectively).

Unnamed Tributary (MA94-43)

Location:	Unnamed tributary to Great Herring Pond, headwaters outlet Little Herring Pond, Plymouth to mouth at inlet of Great Herring Pond, Plymouth.
AU Type:	RIVER
AU Size:	0.6 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA94-43

Watershed Area: 3.93 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.92	3.62	0.34	0.34
Agriculture	1%	1.1%	7.7%	7.7%
Developed	14.5%	14.7%	16.2%	16.2%
Natural	82.3%	81.9%	60.7%	60.7%
Wetland	2.2%	2.4%	15.4%	15.4%
Impervious Cover	7%			

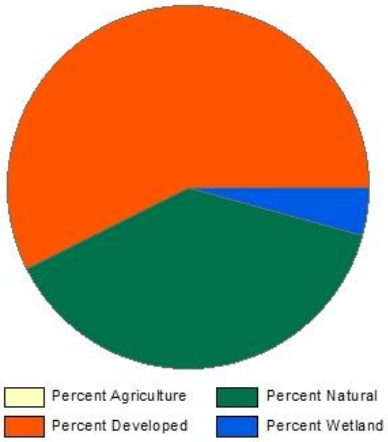
Fish, other Aquatic Life and Wildlife Use: Insufficient Information (Alert)
While sufficient diadromous fish passage currently exists, an alert status will be identified since this herring run is such an important resource in the region and the weir and pool fishway at the canal Motel further downstream has good passage now but is aging and will need attention soon. No other data are available, however, to assess the Aquatic Life Use

Unnamed Tributary (MA94-45)

Location:	Unnamed tributary to Duxbury Bay, source north of Route 3/Cherry Street intersection, Plymouth to mouth at inlet of Duxbury Bay, Plymouth.
AU Type:	RIVER
AU Size:	1.1 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA94-45

Watershed Area: 1.52 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.52	1.52	0.4	0.4
Agriculture	0.1%	0.1%	0%	0%
Developed	57.4%	57.4%	43.4%	43.4%
Natural	38.1%	38.1%	43.8%	43.8%
Wetland	4.3%	4.3%	12.7%	12.7%
Impervious Cover	28.6%			

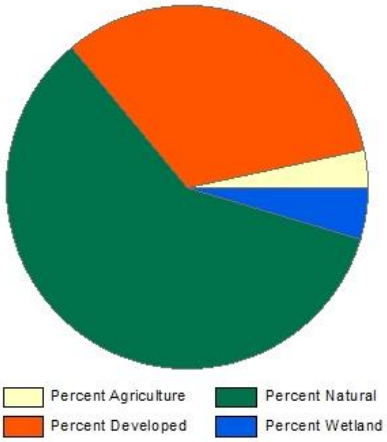
Fish, other Aquatic Life and Wildlife Use: Insufficient Information
In August 2013, DFG biologists conducted backpack electrofishing at two stations along this unnamed tributary locally known as Stone Pond Brook. At the station upstream from Stone Pond multiple age classes of eastern brook trout were documented. However, further downstream from Stone Pond, few fish were captured and no eastern brook trout were collected. Based on these data, while the upper portion of this unnamed tributary appears to fully support the Aquatic Life Use, there is insufficient information available to assess the use downstream from Stone Pond.

Unnamed Tributary (MA94-53)

Location:	Unnamed tributary to Furnace Brook, headwaters outlet Russell Pond, Kingston to mouth at outlet of Soules Pond at headwaters of Furnace Brook, Kingston.
AU Type:	RIVER
AU Size:	0.5 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA94-53

Watershed Area: 1.62 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.62	1.62	0.61	0.61
Agriculture	3.3%	3.3%	8.6%	8.6%
Developed	32.7%	32.7%	17.9%	17.9%
Natural	59.2%	59.2%	65%	65%
Wetland	4.7%	4.7%	8.5%	8.5%
Impervious Cover	12.8%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	4c	(Fish Passage Barrier*)		Added

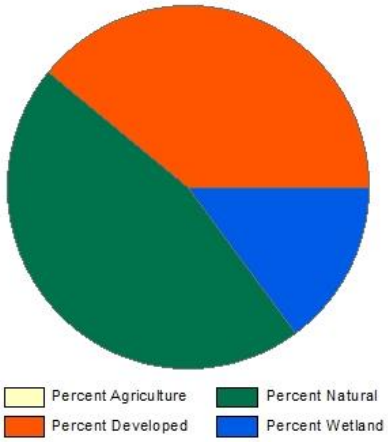
Fish, other Aquatic Life and Wildlife Use: Not Supporting
According to DMF biologists (Chase 2016 and 2017), the very old degraded existing fishway near the earthen dam downstream from Russell Pond in Kingston, does not allow sufficient passage (passage score of 6—restricted passage) for river herring and American eel along this unnamed Tributary and into Russell Pond. The exisiting fishways from Elm Street to Sylvia Place Road (passage score 3 = minor obstruction), at the Sylvia Place Pond Dam (also identified by the Bryant Mill Pond Dam) (passage score 1 = minor obstruction), and the Wildlands Trust stream weirs (passage score = 0) allow passage so are not considered problematic. However, based on the degraded fishway obstruction near the earthen dam downstream from Russell Pond in Kingston, the Aquatic Life Use is assessed as not supporting for this Unnamed Tributary (locally known as part of Furnace Brook) (Assessment Unit MA94-53)

Unnamed Tributary (MA94-55)

Location:	Unnamed tributary (locally known as 'Marshfield Fairgrounds Brook') to South River, from headwaters east of Proctor Street, Marshfield to tidal portion east of Willow Street, Marshfield.
AU Type:	RIVER
AU Size:	0.8 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA94-55

Watershed Area: 0.36 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.36	0.36	0.1	0.1
Agriculture	0.4%	0.4%	0%	0%
Developed	38.9%	38.9%	29%	29%
Natural	45.9%	45.9%	30.8%	30.8%
Wetland	14.8%	14.8%	40.1%	40.1%
Impervious Cover	17.5%			

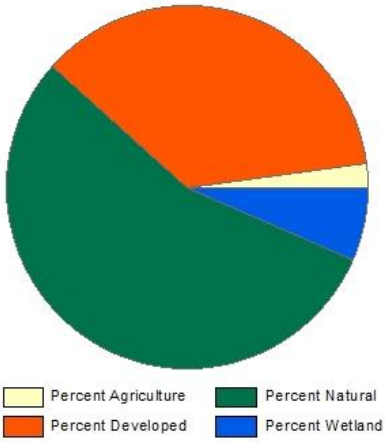
Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)
The Aquatic Life Use is assessed as support for the unnamed tributary locally known as Marshfield Fairgrounds Brook based on the presence of a reproducing eastern brook trout population documented in two DFG fish community samples collected in August 2001 and 2007 near the fairgrounds. This use is identified with an alert status however because of notes related to presence of sedimentation and erosion.

Unnamed Tributary (MA94-59)

Location:	Unnamed tributary (locally known as 'Laundry Brook') to Jones River intersecting Brook Street, Kingston (segment includes distance through Lucas Pond).
AU Type:	RIVER
AU Size:	0.2 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA94-59

Watershed Area: 0.37 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.37	0.37	0.08	0.08
Agriculture	2.1%	2.1%	9.4%	9.4%
Developed	36.3%	36.3%	14.5%	14.5%
Natural	55%	55%	48%	48%
Wetland	6.6%	6.6%	28.1%	28.1%
Impervious Cover	15.4%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	4c	(Fish Passage Barrier*)		Added

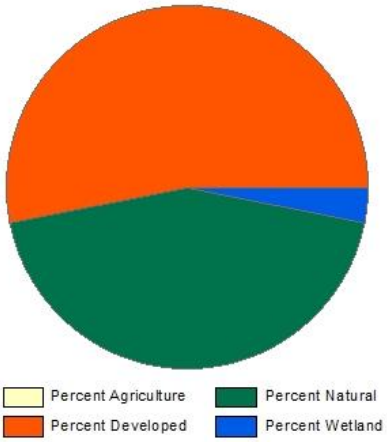
Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Brook Street culvert in Kingston, does not allow passage (passage score of 10—no possible passage) for rainbow smelt and American eel along this Unnamed Tributary locally known as Laundry Brook. Based on this obstruction, the Aquatic Life Use is assessed as impaired for this small Unnamed Tributary (Assessment Unit MA94-59).

Unnamed Tributary (MA94-61)

Location:	Unnamed tributary to Bluefish River (locally considered a portion of Bluefish River), headwaters north of Surplus Street, Duxbury to tidal portion north of Harrison Street, Duxbury.
AU Type:	RIVER
AU Size:	0.5 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA94-61

Watershed Area: 0.89 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.89	0.89	0.16	0.16
Agriculture	0.6%	0.6%	0%	0%
Developed	52.9%	52.9%	33%	33%
Natural	43.3%	43.3%	54.8%	54.8%
Wetland	3.2%	3.2%	12.2%	12.2%
Impervious Cover	13.7%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
--	4c	(Fish Passage Barrier*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
According to DMF biologists (Chase 2016 and 2017), there is one barrier along this unnamed tributary (locally known as part of the Bluefish River) in Duxbury that does not allow passage of river herring and American eel: the fishway at Amory Dam (passage score of 6- restricted passage). Based on this obstruction, the Aquatic Life Use is assessed as impaired for this unnamed tributary locally known as part of the Bluefish River (Assessment Unit MA94-61).

Unnamed Tributary (MA94-62)

Location:	Unnamed tributary to Bluefish River (locally considered a portion of Bluefish River), tidal portion north of Harrison Street, Duxbury to mouth at confluence with Bluefish River, Duxbury.
AU Type:	ESTUARY
AU Size:	0.002 SQUARE MILES
Classification/Qualifier:	SA: SFO

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for this unnamed tributary (locally considered a portion of the Bluefish River AU MA94-62).

Upper Chandler Pond (MA94165)

Location:	Duxbury/Pembroke.
AU Type:	FRESHWATER LAKE
AU Size:	8 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The Aquatic Life Use for Upper Chandler Pond is assessed as not supporting based on the infestation of the non-native aquatic macrophyte *Myriophyllum heterophyllum* that was noted during the 1996 DWM synoptic survey.

Wampatuck Pond (MA94168)

Location:	Hanson.
AU Type:	FRESHWATER LAKE
AU Size:	63 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Fanwort*)		Added
5	5	(Fish Passage Barrier*)		Added
5	5	(Non-Native Aquatic Plants*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
According to DMF biologists there is one barrier along the Indian Head River in Hanover/Hanson, the State Street Dam, that is located downstream from the confluence with Indian Head Brook as well as one barrier at the Wampatuck Pond Dam that do not allow passage of river herring, American eel, and/or American shad into Wampatuck Pond: the State Street Dam (passage score of 8- severe impediment) and the Wampatuck Pond Dam (passage score of 10—no possible passage). Based on the diadromous fish passage obstructions as well as the presence of the non-native aquatic macrophyte *Cabomba caroliniana*, the Aquatic Life Use is assessed as impaired for Wampatuck Pond (Assessment Unit MA94168). The other nutrient related impairments are being carried forward from the prior (2001) surveys and are thought to likely result from the specialty crop production (cranberry bog operations) that exist in the watershed.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	The generic “Non-Native Aquatic Plants” is not needed since the specific macrophyte Cabomba caroliniana (fanwort) has been utilized.

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

In 2001 MassDEP surveyed the pond for the purpose of TMDL development during which time the non-native aquatic macrophyte *Cabomba caroliniana* was documented (Mattson and Haque 2004). The generic “Non-Native Aquatic Plants” is not needed since the specific macrophyte *Cabomba caroliniana* (fanwort) has been utilized.

West Chandler Pond (MA94170)

Location:	Pembroke.
AU Type:	FRESHWATER LAKE
AU Size:	10 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for West Chandler Pond.

Winslow Cemetary Pond (MA94172)

Location:	Marshfield.
AU Type:	FRESHWATER LAKE
AU Size:	6 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for Winslow Cemetary Pond.

Wright Pond (MA94174)

Location:	Duxbury.
AU Type:	FRESHWATER LAKE
AU Size:	30 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available so the Aquatic Life Use is not assessed for Wright Pond.

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