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

# Appendix 19
# Narragansett Bay (Shore) Drainage Area
# Assessment and Listing Decision Summary

**Prepared by:**
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**Division of Watershed Management, Bureau of Water Resources**
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**CN 568.1**

## Massachusetts Department of Environmental Protection

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

## Watershed Planning Program

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

## Disclaimer

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

## Contact Information

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## Notice of Availability

This report is available on the Massachusetts Department of Environmental Protection website: https://www.mass.gov/lists/integrated-lists-of-waters-related-reports.

## Table of Contents

# 2022 Cycle Impairment Changes

| Waterbody | AU_ID | 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|---|---|
| Bad Luck Brook | MA53-11 | 2 | 2 | None | | Unchanged |
| Beaverdam Brook | MA53-10 | 3 | 3 | None | | Unchanged |
| Bliss Brook | MA53-19 | 5 | 5 | Escherichia Coli (E. Coli) | | Unchanged |
| Clear Run Brook | MA53-13 | 5 | 5 | Benthic Macroinvertebrates | | Added |
| Clear Run Brook | MA53-13 | 5 | 5 | Dissolved Oxygen | | Unchanged |
| Clear Run Brook | MA53-13 | 5 | 5 | Escherichia Coli (E. Coli) | 35097 | Unchanged |
| Clear Run Brook | MA53-13 | 5 | 5 | Fecal Coliform | 35097 | Unchanged |
| East Branch Palmer River | MA53-08 | 2 | 5 | Escherichia Coli (E. Coli) | | Added |
| East Branch Palmer River | MA53-08 | 2 | 5 | Lead | | Added |
| Fullers Brook | MA53-12 | 4a | 4a | Escherichia Coli (E. Coli) | 35089 | Unchanged |
| Oak Swamp Brook | MA53-15 | 4a | 4a | Escherichia Coli (E. Coli) | 35091 | Unchanged |
| Palmer River | MA53-03 | 4a | 5 | Enterococcus | | Added |
| Palmer River | MA53-03 | 4a | 5 | Fecal Coliform | 35085 | Unchanged |
| Palmer River | MA53-05 | 4a | 5 | Enterococcus | | Added |
| Palmer River | MA53-05 | 4a | 5 | Fecal Coliform | 35087 | Unchanged |
| Palmer River | MA53-22 | 5 | 5 | Benthic Macroinvertebrates | | Added |
| Palmer River | MA53-22 | 5 | 5 | Escherichia Coli (E. Coli) | 35086 | Unchanged |
| Palmer River | MA53-22 | 5 | 5 | Fecal Coliform | 35086 | Unchanged |
| Palmer River | MA53-22 | 5 | 5 | Lack of a Coldwater Assemblage | | Added |
| Palmer River | MA53-22 | 5 | 5 | Temperature | | Unchanged |
| Rocky Run | MA53-16 | 4a | 5 | Enterococcus | | Added |
| Rocky Run | MA53-16 | 4a | 5 | Escherichia Coli (E. Coli) | 35096 | Unchanged |
| Rocky Run | MA53-16 | 4a | 5 | Fecal Coliform | 35096 | Unchanged |
| Rocky Run | MA53-18 | 4a | 5 | Enterococcus | | Added |
| Rocky Run | MA53-18 | 4a | 5 | Fecal Coliform | 35096 | Unchanged |
| Rumney Marsh Brook | MA53-09 | 3 | 3 | None | | Unchanged |
| Runnins River | MA53-01 | 5 | 5 | (Fish Passage Barrier*) | | Added |
| Runnins River | MA53-01 | 5 | 5 | Benthic Macroinvertebrates | | Unchanged |
| Runnins River | MA53-01 | 5 | 5 | Dissolved Oxygen | | Unchanged |
| Runnins River | MA53-01 | 5 | 5 | Escherichia Coli (E. Coli) | 38903 | Unchanged |
| Runnins River | MA53-01 | 5 | 5 | Fecal Coliform | 38903 | Unchanged |
| Runnins River | MA53-01 | 5 | 5 | Mercury in Fish Tissue | 33880 | Unchanged |
| Runnins River | MA53-01 | 5 | 5 | Nutrient/Eutrophication Biological Indicators | | Unchanged |
| Runnins River | MA53-20 | 5 | 5 | Benthic Macroinvertebrates | | Added |
| Runnins River | MA53-20 | 5 | 5 | Escherichia Coli (E. Coli) | | Unchanged |
| Shad Factory Pond | MA53005 | 5 | 5 | (Dewatering*) | | Unchanged |
| Shad Factory Pond | MA53005 | 5 | 5 | Fecal Coliform | 35086 | Unchanged |
| Shad Factory Pond | MA53005 | 5 | 5 | Nutrient/Eutrophication Biological Indicators | | Unchanged |
| Torrey Creek | MA53-14 | 4a | 5 | (Alteration in Stream-side or Littoral Vegetative Covers*) | | Unchanged |
| Torrey Creek | MA53-14 | 4a | 5 | (Habitat Assessment*) | | Unchanged |

| Waterbody | AU_ID | 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|---|---|
| Torrey Creek | MA53-14 | 4a | 5 | Enterococcus | | Added |
| Torrey Creek | MA53-14 | 4a | 5 | Escherichia Coli (E. Coli) | 35088 | Unchanged |
| Torrey Creek | MA53-17 | 4a | 4a | Fecal Coliform | 35088 | Unchanged |
| Unnamed Tributary | MA53-21 | 5 | 5 | Escherichia Coli (E. Coli) | | Unchanged |
| Warren River Pond | MA53-06 | 4a | 4a | Fecal Coliform | 38904 | Unchanged |
| West Branch Palmer River | MA53-07 | 2 | 5 | (Fish Passage Barrier*) | | Added |
| West Branch Palmer River | MA53-07 | 2 | 5 | Dissolved Oxygen | | Added |

# Bad Luck Brook (MA53-11)

| | |
|---|---|
| **Location:** | Headwaters, outlet Warren Upper Reservoir, Rehoboth to confluence with East Branch Palmer River, Rehoboth. |
| **AU Type:** | RIVER |
| **AU Size:** | 1.7 MILES |
| **Classification/Qualifier:** | B |


| Landuse Type | Entire Basin | 5km Radius Proximal Subbasin | 100m Stream Buffer | Proximal Stream Buffer |
|---|---|---|---|---|
| Land Use Area (square miles) | 4.97 | 4.97 | 0.8 | 0.8 |
| Agriculture | 1% | 1% | 1.5% | 1.5% |
| Developed | 9.8% | 9.8% | 7.4% | 7.4% |
| Natural | 50.1% | 50.1% | 44.3% | 44.3% |
| Wetland | 39% | 39% | 46.8% | 46.8% |
| Impervious Cover | 3.9% | | | |

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

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | YES |
| **2022 Use Attainment Summary** | |

DMF biologists note two structures causing passage limitation to diadromous fish in Bad Luck Brook. The Upper Warren Reservoir Dam (NATID# MA00794) at the boundary between Warren Upper Reservoir (currently not an AU) and Bad Luck Brook, was given a passage score of "10" on a 0-10 scale, indicating that the dam allows no possible passage of the targeted fish species, river herring and American eel. DMF biologists also note that a fishway is needed at Upper Reservoir, but that there are low flow concerns due to water supply. Further downstream, the Bad Luck Brook Dam (NATID# MA03077), just upstream of County Street in Rehoboth, was also given a passage score of "10". The population score was noted to be "0" (no run present) for both structures; consequently, an impairment decision will not be made at this time. EPA conducted discrete water quality monitoring at Kelton (EPA_BL12), Elm (EPA_BL11) and County Street (EPA_BL10), Rehoboth, during the summer of 2012 and 2013. Most data were indicative of good water quality (a summary incorporating data from all three stations follows): pH ranged from 5.6-7.0SU (n=8) (with 7 out of 8 measurements falling below 6.5SU and once below 6.0SU); maximum temperature 21.8°C (n=2); minimum DO 6.4mg/L and maximum saturation 125.4% (with most measurements much less than 125%) (n=8). Specific conductance was all low with a max of 127µS/cm (n=8), with none measuring above the estimated chloride criterion. The low pH measurements throughout Bad Luck Brook are of note but are judged to be a natural condition due to the large amount of wetland (wooded and shrub swamp) in the watershed, as depicted by the MassGIS detailed wetland layer.
The Aquatic Life Use of Bad Luck Brook (MA53-11) will continue to be assessed as Fully Supporting based on the EPA water quality data being indicative of good conditions. The prior Alert holds as "Need for improvement of fish passage at dams", based on the DMF passage scores assigned to the Upper Warren Reservoir Dam and the Bad Luck Brook Dam.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_BL10 | Environmental Protection Agency | Water Quality | Bad Luck Brook | Bad Luck Brook @ County Street, Rehoboth | 41.842018 | -71.233902 |
| EPA_BL11 | Environmental Protection Agency | Water Quality | Bad Luck Brook | Bad Luck Brook @ Elm Street, Rehoboth | 41.838653 | -71.232656 |
| EPA_BL12 | Environmental Protection Agency | Water Quality | Bad Luck Brook | Bad Luck Brook @ Kelton Street, Rehoboth | 41.831414 | -71.223928 |

### *Biological Monitoring Information*

#### Habitat and Flow Data (anthropogenic alterations)

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

| Assessment Summary |
|---|
| DMF biologists note two structures causing passage limitation to diadromous fish, in the lower half and also at the upper end of the Bad Luck Brook AU. The Upper Warren Reservoir Dam (NATID# MA00794) at the boundary between Warren Upper Reservoir (currently not an AU) and Bad Luck Brook, was given a passage score of "10" on a 0-10 scale, indicating that the dam allows no possible passage of the targeted fish species, river herring and American eel. DMF biologists also note that a fishway is needed at Upper Reservoir, but that there are low flow concerns due to water supply. Further down the AU, the Bad Luck Brook Dam (NATID# MA03077), just upstream of County Street in Rehoboth, was also given a passage score of "10", indicating that this dam also allows no possible passage of the same targeted fish species. The population score was noted to be "0" (no run present) for both structures; consequently, an impairment decision can't be made at this time for Bad Luck Brook (Assessment Unit MA53-11). |

## *Physico-chemical Water Quality Information*

### DO, pH, Temperature

**EPA Freshwater Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)
[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| EPA_BL10 | 10/23/12 | 10/23/12 | 1 | 13.5 | 13.5 | 0 | 0 | 0 |
| EPA_BL10 | 07/09/13 | 09/25/13 | 2 | 6.8 | 8.2 | 0 | 0 | 0 |
| EPA_BL11 | 10/23/12 | 10/23/12 | 1 | 13.3 | 13.3 | 0 | 0 | 0 |
| EPA_BL11 | 07/09/13 | 09/25/13 | 2 | 6.4 | 8.1 | 0 | 0 | 0 |
| EPA_BL12 | 10/23/12 | 10/23/12 | 1 | 10.3 | 10.3 | 0 | 0 | 0 |
| EPA_BL12 | 09/25/13 | 09/25/13 | 1 | 6.4 | 6.4 | 0 | 0 | 0 |

**EPA Freshwater Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA_BL10 | 10/23/12 | 10/23/12 | 1 | 0 | 12.0 | 12.0 | 0 | 0 | 0 | 0 |
| EPA_BL10 | 07/09/13 | 09/25/13 | 2 | 1 | 21.8 | 17.2 | 1 | 0 | 0 | 0 |
| EPA_BL11 | 10/23/12 | 10/23/12 | 1 | 0 | 13.0 | 13.0 | 0 | 0 | 0 | 0 |
| EPA_BL11 | 07/09/13 | 09/25/13 | 2 | 1 | 21.5 | 17.2 | 1 | 0 | 0 | 0 |
| EPA_BL12 | 10/23/12 | 10/23/12 | 1 | 0 | 15.1 | 15.1 | 0 | 0 | 0 | 0 |
| EPA_BL12 | 09/25/13 | 09/25/13 | 1 | 0 | 13.8 | 13.8 | 0 | 0 | 0 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_BL10 | 10/23/12 | 10/23/12 | 1 | 6.1 | 6.1 | 1 | 0 |
| EPA_BL10 | 07/09/13 | 09/25/13 | 2 | 6.1 | 7.0 | 1 | 0 |
| EPA_BL11 | 10/23/12 | 10/23/12 | 1 | 6.0 | 6.0 | 1 | 0 |
| EPA_BL11 | 07/09/13 | 09/25/13 | 2 | 6.0 | 6.9 | 1 | 0 |
| EPA_BL12 | 10/23/12 | 10/23/12 | 1 | 5.6 | 5.6 | 1 | 1 |
| EPA_BL12 | 09/25/13 | 09/25/13 | 1 | 6.9 | 6.9 | 0 | 0 |

### Nutrients (Primary Producer Screening, Physico-chemical Screening)

**EPA Freshwater Nutrient Enrichment Indicator Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | DO Sat Max (%) | pH Max (SU) |
|---|---|---|---|---|---|---|---|
| EPA_BL10 | 2012 | -- | -- | -- | -- | 125.4 | 6.1 |
| EPA_BL10 | 2013 | -- | -- | -- | -- | 90.9 | 7.0 |
| EPA_BL11 | 2012 | -- | -- | -- | -- | 120.6 | 6.0 |
| EPA_BL11 | 2013 | -- | -- | -- | -- | 93.0 | 6.9 |
| EPA_BL12 | 2012 | -- | -- | -- | -- | 102.9 | 5.6 |
| EPA_BL12 | 2013 | -- | -- | -- | -- | 61.1 | 6.9 |

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

**EPA Discrete Specific Conductance Data (2012-2013, 2016-2019) Compared to Estimated Chloride Criteria.** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_BL10 | 10/23/12 | 10/23/12 | 1 | 108 | 108 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_BL10 | 07/09/13 | 09/25/13 | 2 | 115 | 122 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_BL11 | 10/23/12 | 10/23/12 | 1 | 105 | 105 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_BL11 | 07/09/13 | 09/25/13 | 2 | 110 | 127 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_BL12 | 10/23/12 | 10/23/12 | 1 | 100 | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_BL12 | 09/25/13 | 09/25/13 | 1 | 97 | 97 | 0 | 0 | 0 | 0 | 0 | 0 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH; therefore, the Fish Consumption Use for Bad Luck Brook (MA53-11) is Not Assessed. | |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No data are available to assess the status of the Aesthetic Use for Bad Luck Brook (MA53-11), so it is Not Assessed. | |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Insufficient Information | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria data were collected in Bad Luck Brook (MA53-11) at the following sampling stations (data years): EPA 1-2 times per year –at Kelton (EPA_BL12), Elm (EPA_BL11) and County Street (EPA_BL10), Rehoboth, during the summer of 2012 and 2013. The available bacteria data are too limited to assess the Primary Contact Recreational Use for this AU according to the CALM "Use Attainment Impairment Decision Schema"; consequently, the Bad Luck Brook is assessed as having Insufficient Information available to make a Primary Contact Recreational Use assessment decision. | |

## *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_BL10 | Environmental Protection Agency | Water Quality | Bad Luck Brook | Bad Luck Brook @ County Street, Rehoboth | 41.842018 | -71.233902 |
| EPA_BL11 | Environmental Protection Agency | Water Quality | Bad Luck Brook | Bad Luck Brook @ Elm Street, Rehoboth | 41.838653 | -71.232656 |
| EPA_BL12 | Environmental Protection Agency | Water Quality | Bad Luck Brook | Bad Luck Brook @ Kelton Street, Rehoboth | 41.831414 | -71.223928 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_BL10 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 101 | 101 | 101 |
| EPA_BL10 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 244 | 560 | 370 |
| EPA_BL11 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 334 | 334 | 334 |
| EPA_BL11 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 285 | 1045 | 546 |
| EPA_BL12 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 4 | 4 | 4 |
| EPA_BL12 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 30 | 30 | 30 |

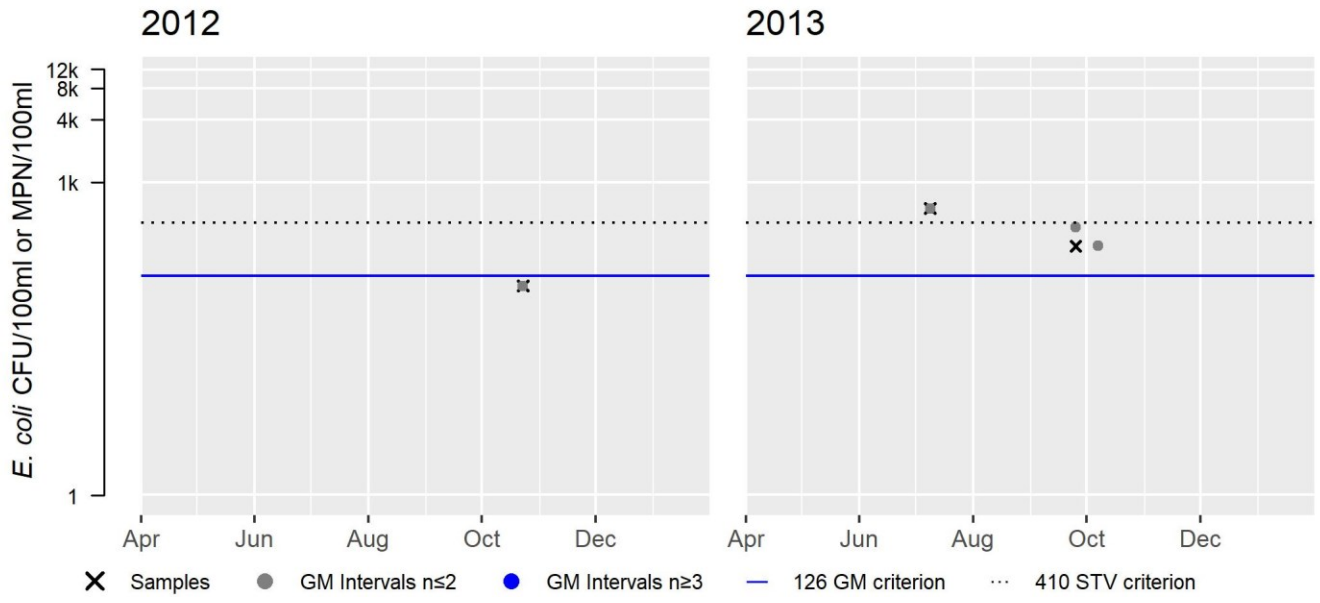
## EPA_BL10 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 101 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 370 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



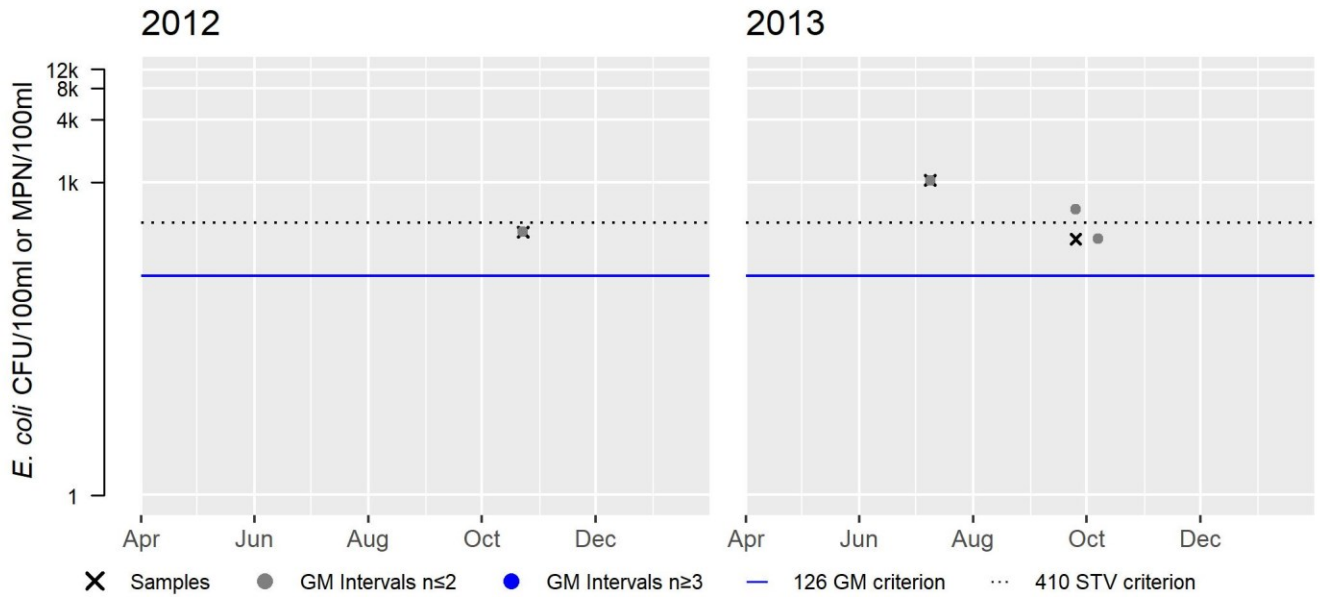
## EPA_BL11 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 334 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 546 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



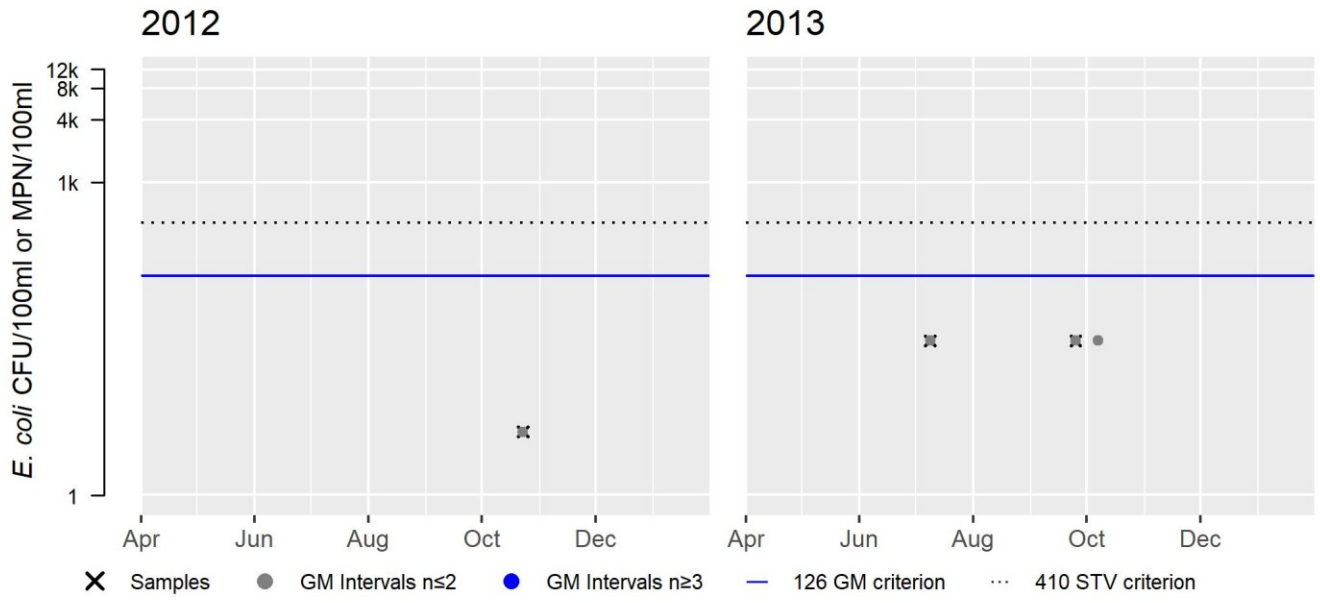
EPA_BL12 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 4 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 30 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |




## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|
| Insufficient Information | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria data were collected in Bad Luck Brook (MA53-11) at the following sampling stations (data years): EPA 1-2 times per year –at Kelton (EPA_BL12), Elm (EPA_BL11) and County Street (EPA_BL10), Rehoboth, during the summer of 2012 and 2013. The available bacteria data are too limited to assess the Secondary Contact Recreational Use for this AU according to the CALM "Use Attainment Impairment Decision Schema"; consequently, the Bad Luck Brook is assessed as having Insufficient Information available to make a Secondary Contact Recreational Use assessment decision. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_BL10 | Environmental Protection Agency | Water Quality | Bad Luck Brook | Bad Luck Brook @ County Street, Rehoboth | 41.842018 | -71.233902 |
| EPA_BL11 | Environmental Protection Agency | Water Quality | Bad Luck Brook | Bad Luck Brook @ Elm Street, Rehoboth | 41.838653 | -71.232656 |
| EPA_BL12 | Environmental Protection Agency | Water Quality | Bad Luck Brook | Bad Luck Brook @ Kelton Street, Rehoboth | 41.831414 | -71.223928 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_BL10 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 101 | 101 | 101 |
| EPA_BL10 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 244 | 560 | 370 |
| EPA_BL11 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 334 | 334 | 334 |
| EPA_BL11 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 285 | 1045 | 546 |
| EPA_BL12 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 4 | 4 | 4 |
| EPA_BL12 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 30 | 30 | 30 |

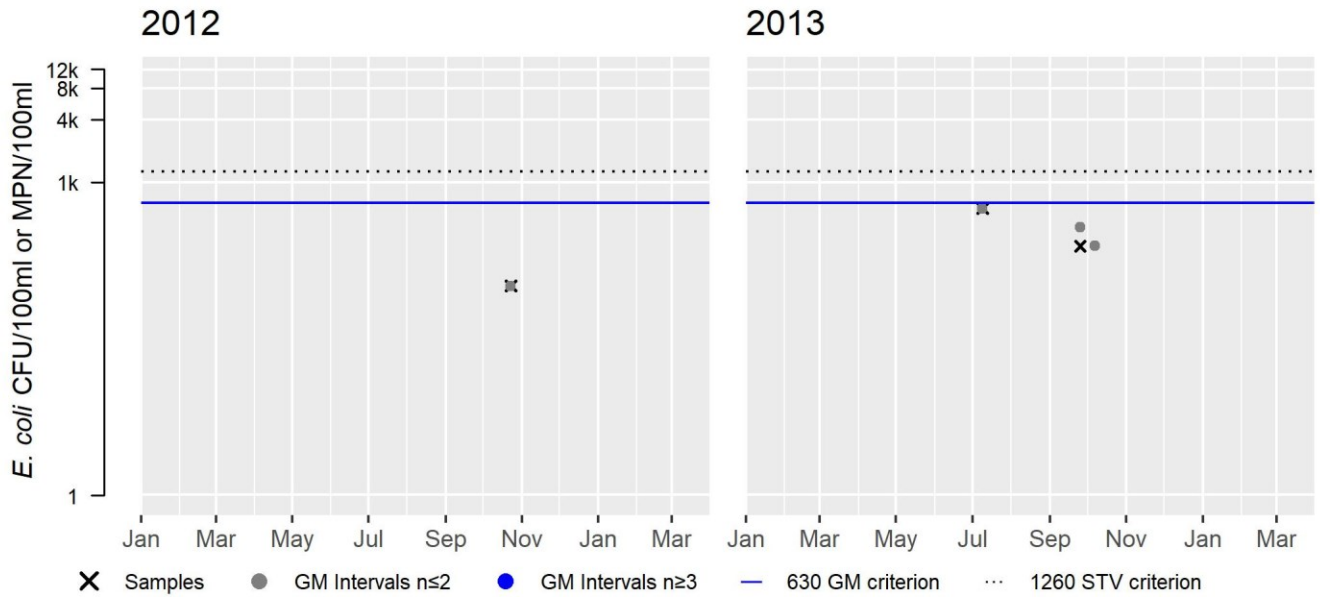
## EPA_BL10 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 101 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 370 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



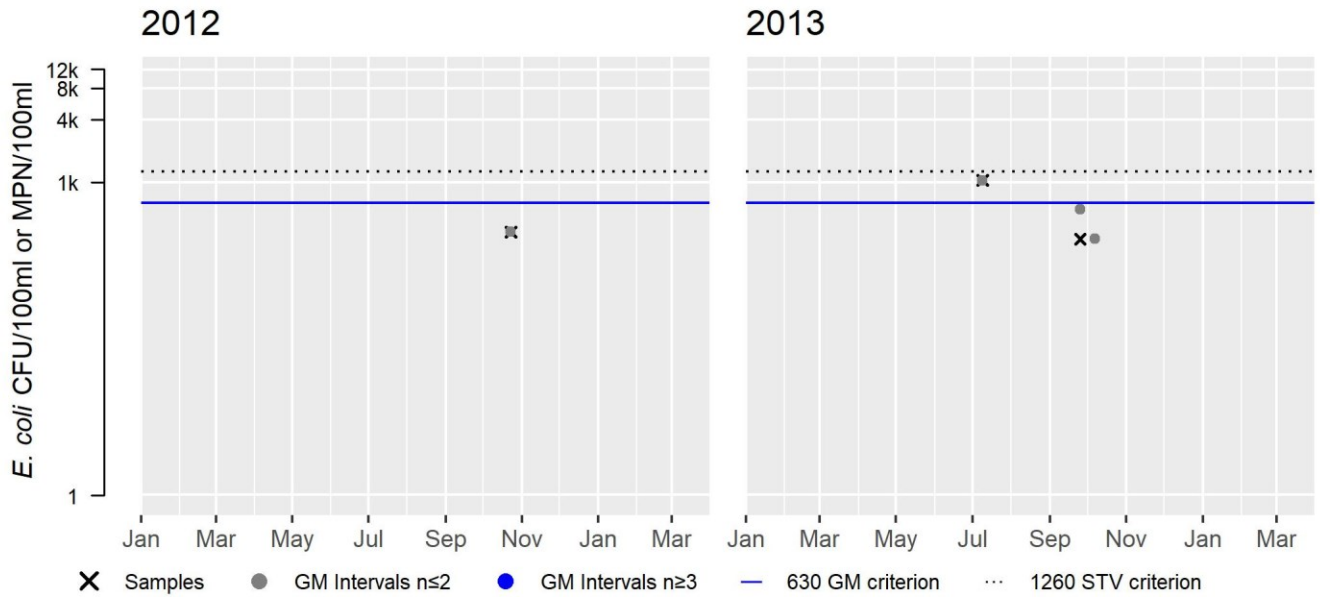
## EPA_BL11 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 334 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 546 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



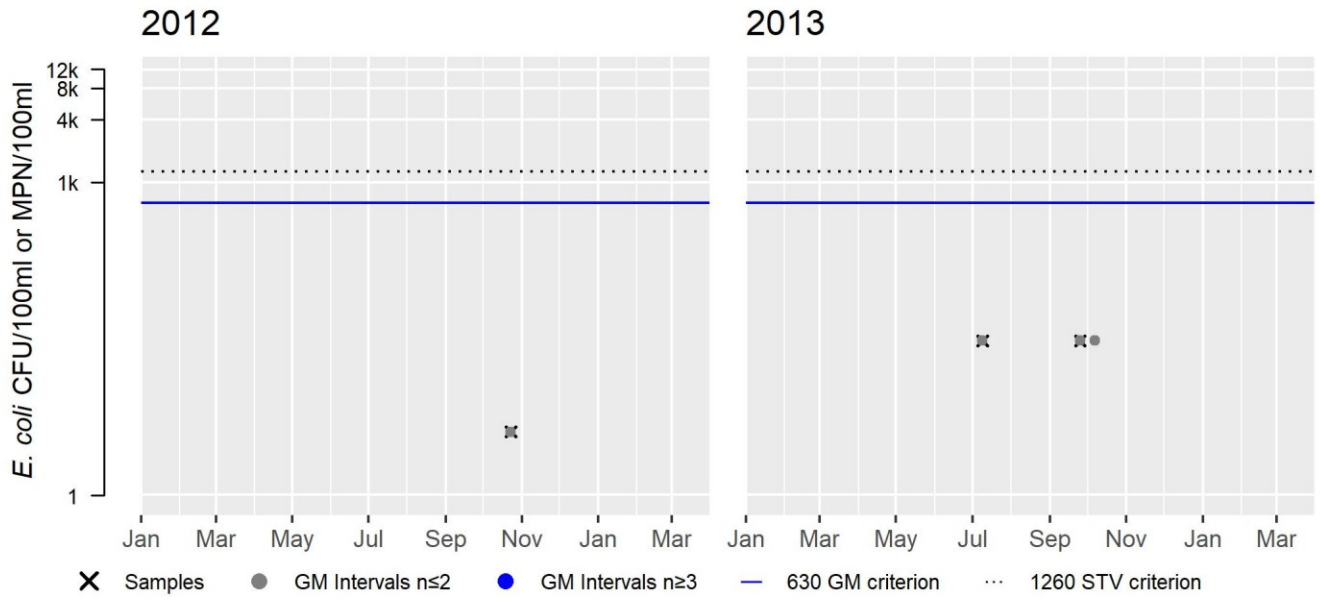
## EPA_BL12 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 4 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 30 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |

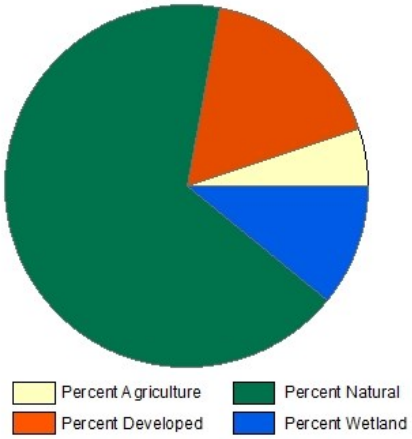


# Beaverdam Brook (MA53-10)

| | |
|---|---|
| **Location:** | Headwaters, southeast of Chestnut Street, Rehoboth to confluence with Palmer River, Rehoboth. |
| **AU Type:** | RIVER |
| **AU Size:** | 2.9 MILES |
| **Classification/Qualifier:** | B |

**Beaverdam Brook - MA53-10**

Watershed Area: 1.67 square miles




| Landuse Type | Entire Basin | 5km Radius Proximal Subbasin | 100m Stream Buffer | Proximal Stream Buffer |
|---|---|---|---|---|
| Land Use Area (square miles) | 1.67 | 1.67 | 0.69 | 0.69 |
| Agriculture | 5.1% | 5.1% | 5.8% | 5.8% |
| Developed | 17% | 17% | 11.6% | 11.6% |
| Natural | 67% | 67% | 74.2% | 74.2% |
| Wetland | 10.9% | 10.9% | 8.4% | 8.4% |
| Impervious Cover | 5.9% | | | |

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

## Recommendations

| 2022 Recommendations |
|---|
| ALU: Additional DO monitoring in Beaverdam Brook is recommended to confirm that episodes of low DO are a result of natural conditions. |

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Insufficient Information | YES |
| **2022 Use Attainment Summary** | |

EPA conducted discrete water quality monitoring in Beaverdam Brook at Chestnut (EPA_BB15), Summer (EPA_BB16) and Pond Street (EPA_BB14), Rehoboth, during the summer of 2012 and 2013. The data was limited but most were indicative of good water quality (a summary incorporating data from all stations follows): pH ranged from 5.5-7.3SU (n=9) (with 4 out of 9 measurements falling below 6.5SU and twice below 6.0SU); maximum temperature 22°C (n=3); minimum DO 2.7mg/L (with all except one measurement >5mg/L) and maximum DO saturation 96.1% (n=9). Specific conductance was all low with a max of 180µS/cm (n=9), with none measuring above the estimated chronic criterion. The low pH measurements throughout Beaverdam Brook are of note but are judged to be a natural condition due to the large amount of wetland (wooded swamp and deep marsh) in the watershed, as depicted by the MassGIS detailed wetland layer. Similarly, the one incidence of very low DO at Chestnut Street is judged to be a result of natural conditions due to the large amount of wetland in the watershed, with wetland constituting 10.9% basin wide and 8.4% in the proximal stream buffer. There is insufficient information to assess the Aquatic Life Use of Beaverdam Brook (MA53-10). In consideration of the extremity of the one low DO measurement, an Alert will be added with a recommendation to conduct more DO monitoring in this AU.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_BB14 | Environmental Protection Agency | Water Quality | Beaverdam Brook | Beaverdam Brook @ Pond Street, Rehoboth] | 41.834897 | -71.270274 |
| EPA_BB15 | Environmental Protection Agency | Water Quality | Beaverdam Brook | Beaverdam Brook @ Chestnut Street, Rehoboth | 41.827112 | -71.241183 |
| EPA_BB16 | Environmental Protection Agency | Water Quality | Beaverdam Brook | Beaverdam Brook @ Summer Street, Rehoboth | 41.831583 | -71.25998 |

### *Physico-chemical Water Quality Information*

#### DO, pH, Temperature

**EPA Freshwater Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)
[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| EPA_BB14 | 10/23/12 | 10/23/12 | 1 | 6.6 | 6.6 | 0 | 0 | 0 |
| EPA_BB14 | 07/09/13 | 09/25/13 | 2 | 5.5 | 7.1 | 0 | 0 | 0 |
| EPA_BB15 | 10/23/12 | 10/23/12 | 1 | 6.8 | 6.8 | 0 | 0 | 0 |
| EPA_BB15 | 07/09/13 | 09/25/13 | 2 | 2.7 | 4.1 | 1 | 1 | 1 |
| EPA_BB16 | 10/23/12 | 10/23/12 | 1 | 10.2 | 10.2 | 0 | 0 | 0 |
| EPA_BB16 | 07/09/13 | 09/25/13 | 2 | 7.0 | 8.7 | 0 | 0 | 0 |

**EPA Freshwater Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA_BB14 | 10/23/12 | 10/23/12 | 1 | 0 | 9.7 | 9.7 | 0 | 0 | 0 | 0 |
| EPA_BB14 | 07/09/13 | 09/25/13 | 2 | 1 | 20.8 | 15.8 | 1 | 0 | 0 | 0 |
| EPA_BB15 | 10/23/12 | 10/23/12 | 1 | 0 | 12.8 | 12.8 | 0 | 0 | 0 | 0 |
| EPA_BB15 | 07/09/13 | 09/25/13 | 2 | 1 | 20.0 | 15.9 | 0 | 0 | 0 | 0 |
| EPA_BB16 | 10/23/12 | 10/23/12 | 1 | 0 | 16.6 | 16.6 | 0 | 0 | 0 | 0 |
| EPA_BB16 | 07/09/13 | 09/25/13 | 2 | 1 | 22.0 | 17.0 | 1 | 0 | 0 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_BB14 | 10/23/12 | 10/23/12 | 1 | 6.4 | 6.4 | 1 | 0 |
| EPA_BB14 | 07/09/13 | 09/25/13 | 2 | 6.2 | 7.2 | 1 | 0 |
| EPA_BB15 | 10/23/12 | 10/23/12 | 1 | 5.5 | 5.5 | 1 | 1 |
| EPA_BB15 | 07/09/13 | 09/25/13 | 2 | 5.5 | 7.1 | 1 | 1 |
| EPA_BB16 | 10/23/12 | 10/23/12 | 1 | 6.6 | 6.6 | 0 | 0 |
| EPA_BB16 | 07/09/13 | 09/25/13 | 2 | 6.5 | 7.3 | 0 | 0 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**EPA Freshwater Nutrient Enrichment Indicator Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | DO Sat Max (%) | pH Max (SU) |
|---|---|---|---|---|---|---|---|
| EPA_BB14 | 2012 | -- | -- | -- | -- | 50.9 | 6.4 |
| EPA_BB14 | 2013 | -- | -- | -- | -- | 78.0 | 7.2 |
| EPA_BB15 | 2012 | -- | -- | -- | -- | 66.3 | 5.5 |
| EPA_BB15 | 2013 | -- | -- | -- | -- | 50.1 | 7.1 |
| EPA_BB16 | 2012 | -- | -- | -- | -- | 93.4 | 6.6 |
| EPA_BB16 | 2013 | -- | -- | -- | -- | 96.1 | 7.3 |

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

**EPA Discrete Specific Conductance Data (2012-2013, 2016-2019) Compared to Estimated Chloride Criteria.** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_BB14 | 10/23/12 | 10/23/12 | 1 | 166 | 166 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_BB14 | 07/09/13 | 09/25/13 | 2 | 151 | 180 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_BB15 | 10/23/12 | 10/23/12 | 1 | 128 | 128 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_BB15 | 07/09/13 | 09/25/13 | 2 | 147 | 150 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_BB16 | 10/23/12 | 10/23/12 | 1 | 166 | 166 | 0 | 0 | 0 | 0 | 0 | 0 |

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_BB16 | 07/09/13 | 09/25/13 | 2 | 152 | 168 | 0 | 0 | 0 | 0 | 0 | 0 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH, therefore the Fish Consumption Use for Beaverdam Brook (MA53-10), is Not Assessed. | |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No data are available to assess the status of the Aesthetic Use for Beaverdam Brook (MA53-10), so it is Not Assessed. | |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Insufficient Information | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria data were collected in Beaverdam Brook (MA53-10) at the following sampling stations (data years): EPA 1-2 times per year – at Chestnut (EPA_BB15), Summer (EPA_BB16) and Pond Street (EPA_BB14), Rehoboth, during the summer of 2012 and 2013. The available bacteria data are too limited to assess the Primary Contact Recreational Use for this AU according to the CALM "Use Attainment Impairment Decision Schema"; consequently, Beaverdam Brook is assessed as having Insufficient Information available to make a Primary Contact Recreational Use assessment decision. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_BB14 | Environmental Protection Agency | Water Quality | Beaverdam Brook | Beaverdam Brook @ Pond Street, Rehoboth] | 41.834897 | -71.270274 |
| EPA_BB15 | Environmental Protection Agency | Water Quality | Beaverdam Brook | Beaverdam Brook @ Chestnut Street, Rehoboth | 41.827112 | -71.241183 |
| EPA_BB16 | Environmental Protection Agency | Water Quality | Beaverdam Brook | Beaverdam Brook @ Summer Street, Rehoboth | 41.831583 | -71.25998 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_BB14 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 156 | 156 | 156 |
| EPA_BB14 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 384 | 714 | 524 |
| EPA_BB15 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 8 | 8 | 8 |
| EPA_BB15 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 112 | 1379 | 393 |
| EPA_BB16 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 68 | 68 | 68 |
| EPA_BB16 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 30 | 76 | 48 |

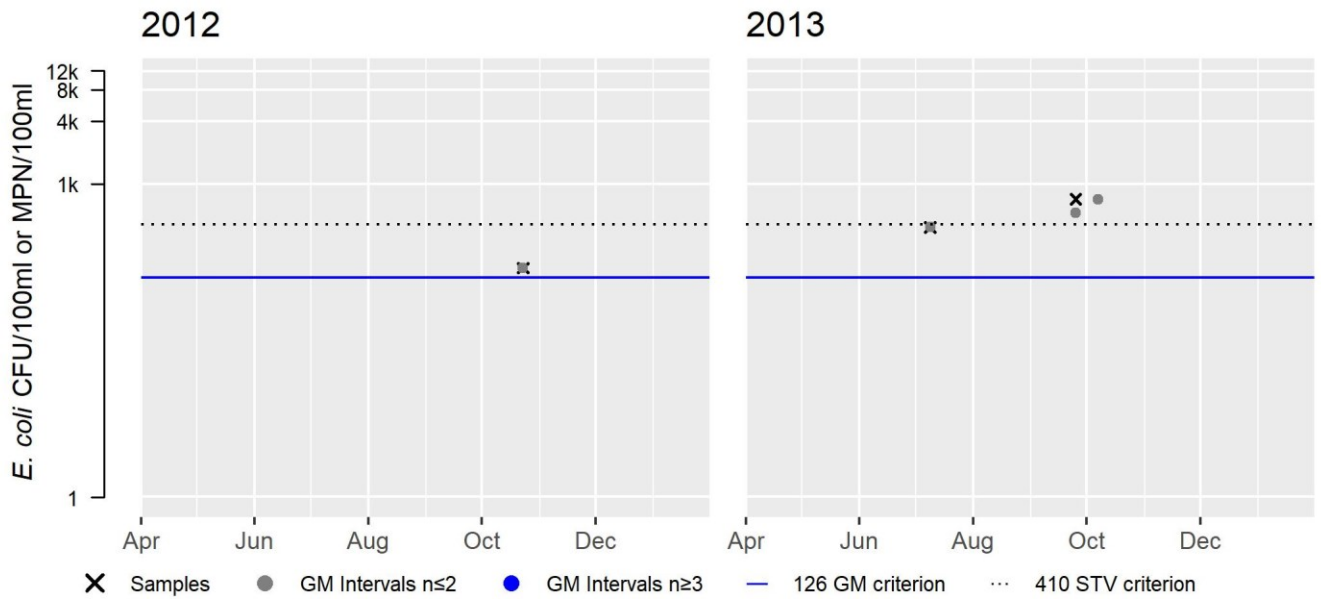
## EPA_BB14 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 156 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 524 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



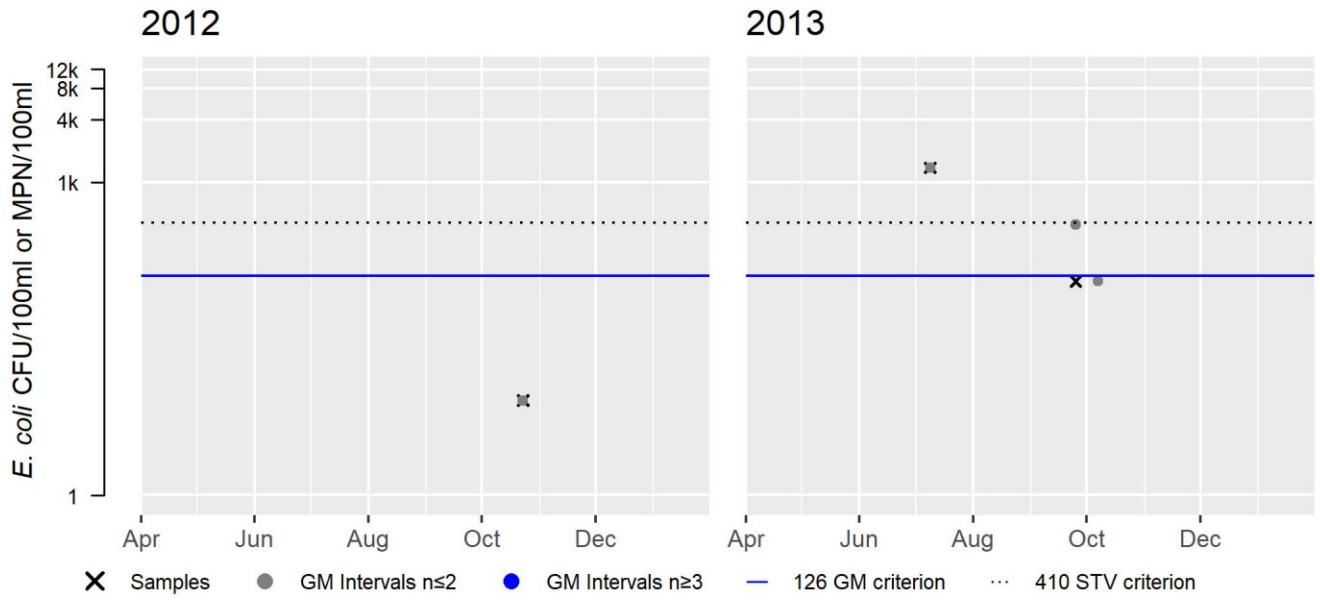
## EPA_BB15 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 8 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 393 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



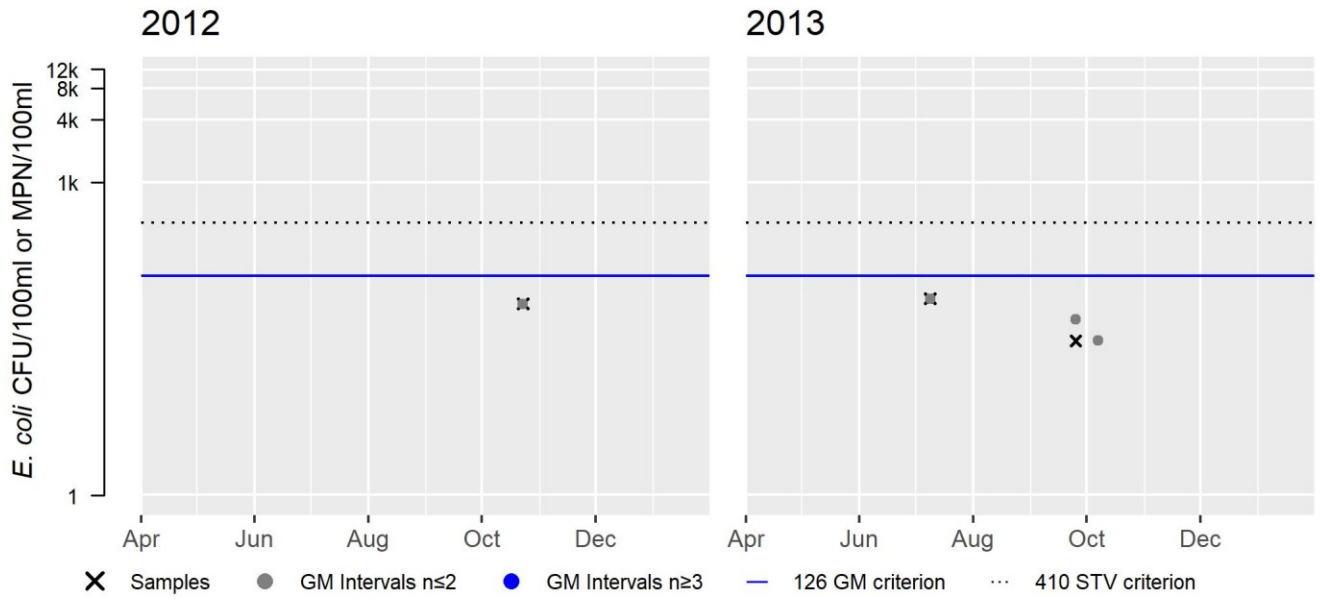
EPA_BB16 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 68 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 48 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |




## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|
| Insufficient Information | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria data were collected in Beaverdam Brook (MA53-10) at the following sampling stations (data years): EPA 1-2 times per year – at Chestnut (EPA_BB15), Summer (EPA_BB16) and Pond Street (EPA_BB14), Rehoboth, during the summer of 2012 and 2013. The available bacteria data are too limited to assess the Secondary Contact Recreational Use for this AU according to the CALM "Use Attainment Impairment Decision Schema"; consequently, Beaverdam Brook is assessed as having Insufficient Information available to make a Secondary Contact Recreational Use assessment decision. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_BB14 | Environmental Protection Agency | Water Quality | Beaverdam Brook | Beaverdam Brook @ Pond Street, Rehoboth] | 41.834897 | -71.270274 |
| EPA_BB15 | Environmental Protection Agency | Water Quality | Beaverdam Brook | Beaverdam Brook @ Chestnut Street, Rehoboth | 41.827112 | -71.241183 |
| EPA_BB16 | Environmental Protection Agency | Water Quality | Beaverdam Brook | Beaverdam Brook @ Summer Street, Rehoboth | 41.831583 | -71.25998 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_BB14 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 156 | 156 | 156 |
| EPA_BB14 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 384 | 714 | 524 |
| EPA_BB15 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 8 | 8 | 8 |
| EPA_BB15 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 112 | 1379 | 393 |
| EPA_BB16 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 68 | 68 | 68 |
| EPA_BB16 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 30 | 76 | 48 |

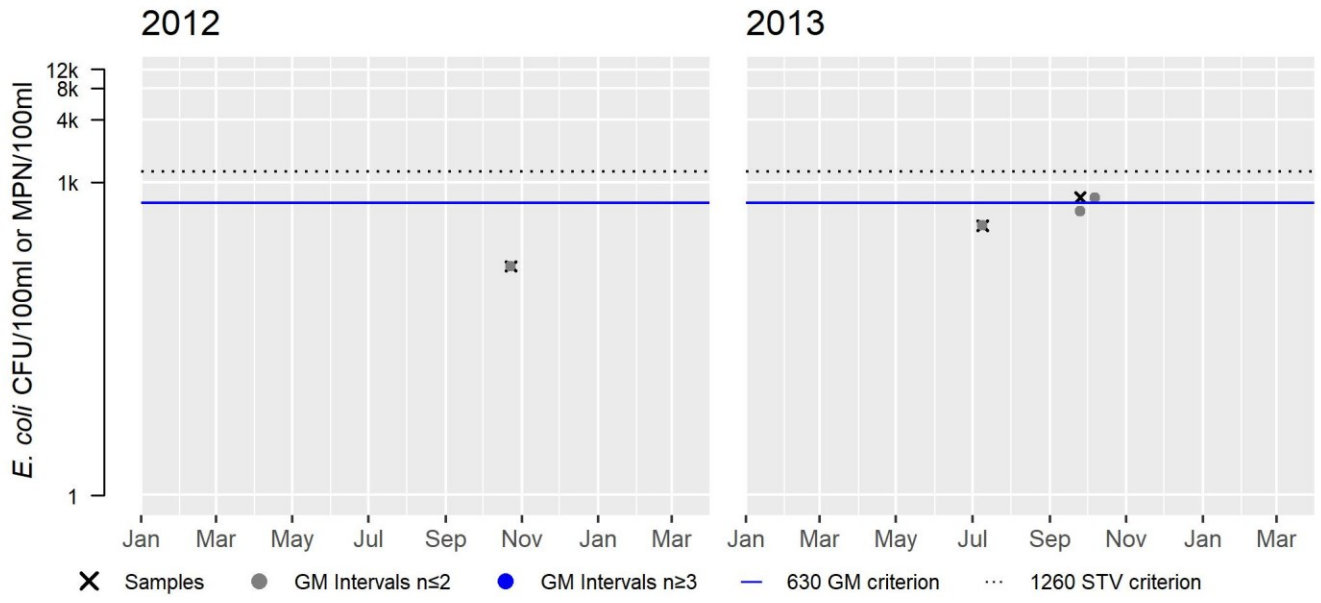
## EPA_BB14 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 156 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 524 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



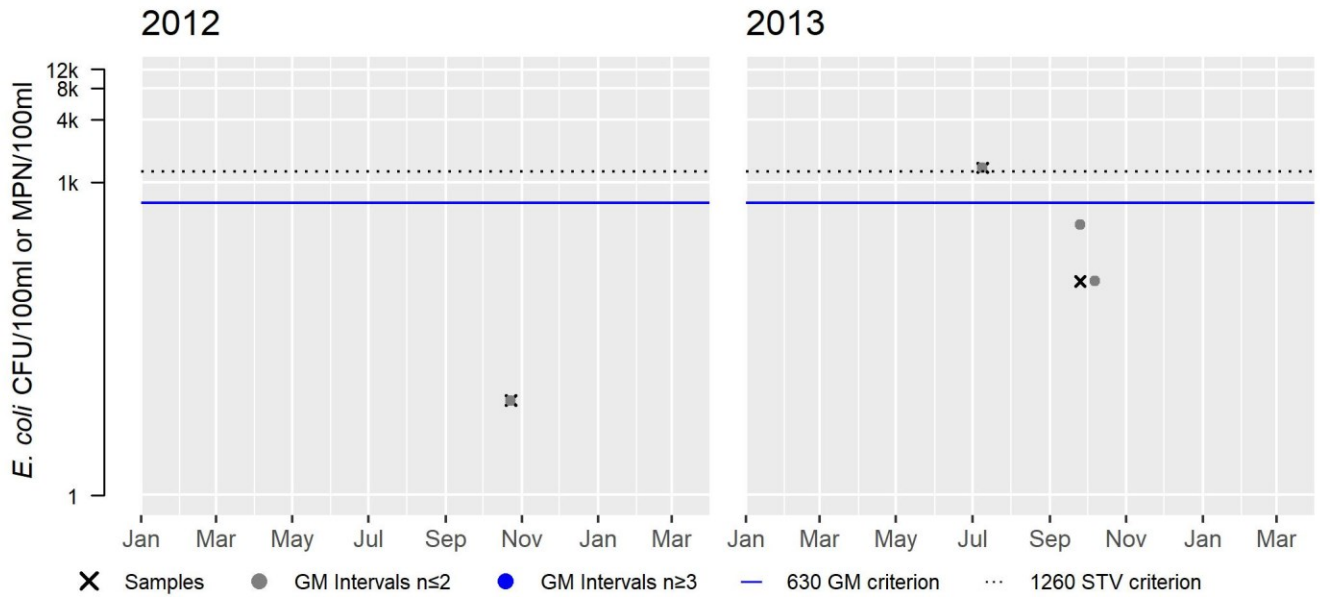
## EPA_BB15 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 8 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 393 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



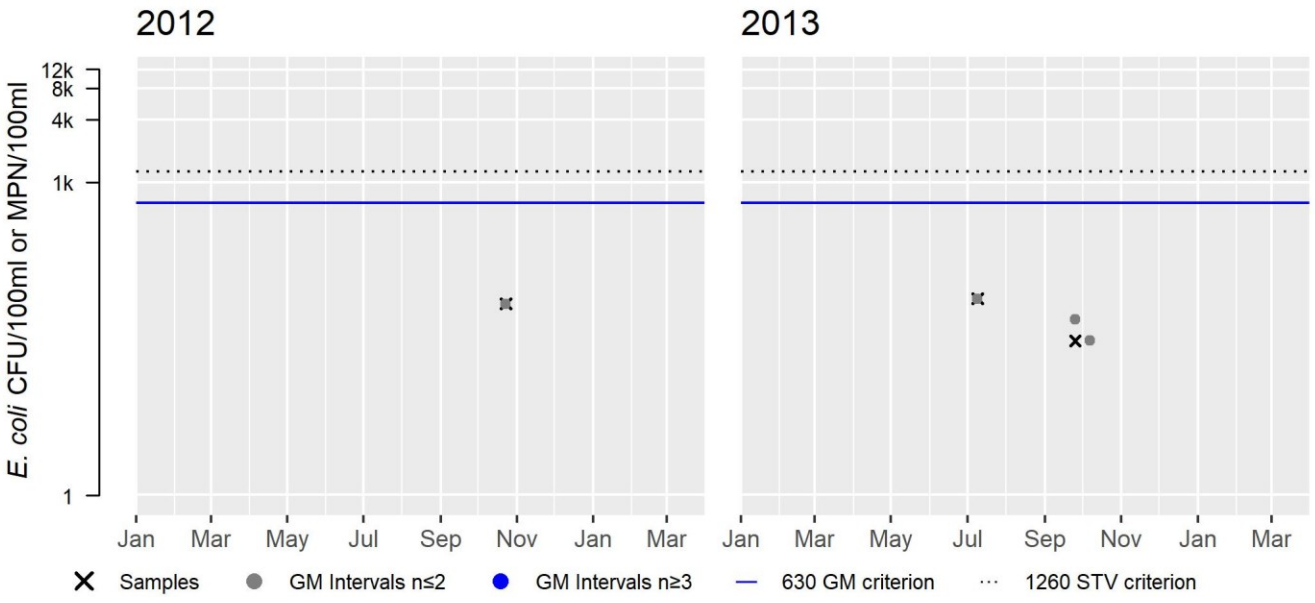
## EPA_BB16 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 68 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 48 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |

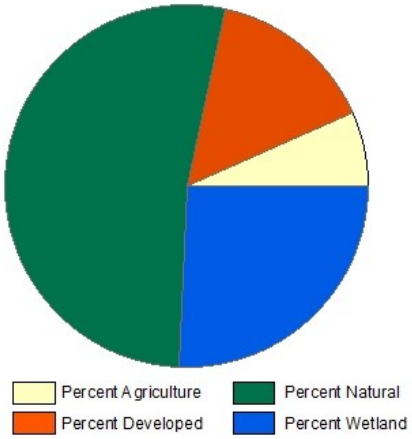


# Bliss Brook (MA53-19)

| | |
|---|---|
| **Location:** | Headwaters north of Tremont Street, Rehoboth to mouth at confluence with West Branch Palmer River, Rehoboth. |
| **AU Type:** | RIVER |
| **AU Size:** | 2.4 MILES |
| **Classification/Qualifier:** | B |

**Bliss Brook - MA53-19**

Watershed Area: 2.17 square miles




| Landuse Type | Entire Basin | 5km Radius Proximal Subbasin | 100m Stream Buffer | Proximal Stream Buffer |
|---|---|---|---|---|
| Land Use Area (square miles) | 2.17 | 2.17 | 0.61 | 0.61 |
| Agriculture | 6.6% | 6.6% | 10% | 10% |
| Developed | 15% | 15% | 8.9% | 8.9% |
| Natural | 52.7% | 52.7% | 37.9% | 37.9% |
| Wetland | 25.7% | 25.7% | 43.3% | 43.3% |
| Impervious Cover | 5.2% | | | |

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

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

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | NO |
| **2022 Use Attainment Summary** | |

EPA conducted discrete water quality monitoring towards the downstream end of the Bliss Brook AU at Ash Street (EPA_WB34), Rehoboth, during the summer of 2012 and 2013. The data was limited but most were indicative of good water quality: pH ranged from 6.8-7.5SU (n=3); maximum temperature 20.8°C (n=1); minimum DO 3.5mg/L (with all except one measurement >5mg/L) and maximum DO saturation 82.4% (n=3). Specific conductance was all low with a maximum of 126µS/cm (n=3), with none measuring above the estimated chloride criterion. The one incidence of low DO is judged to be a result of natural conditions, with wetlands constituting 43.3% in the proximal stream buffer and nearly 80% natural land in the watershed overall.
The Aquatic Life Use of Bliss Brook (MA53-19) will continue to be assessed as Fully Supporting based primarily on July 2013 DFG fish sampling data (presence of the moderately tolerant fluvial species redfin pickerel) (MassDFG 2020) (MassDEP Undated 7) as well as the limited EPA water quality data collected in 2012 and 2013, that were generally indicative of good conditions.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_WB34 | Environmental Protection Agency | Water Quality | Bliss Brook | Bliss Brook @ Ash Street, Rehoboth | 41.885179 | -71.264872 |

### *Physico-chemical Water Quality Information*

#### DO, pH, Temperature

**EPA Freshwater Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)
[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| EPA_WB34 | 10/23/12 | 10/23/12 | 1 | 9.1 | 9.1 | 0 | 0 | 0 |
| EPA_WB34 | 07/09/13 | 09/25/13 | 2 | 3.5 | 4.7 | 1 | 1 | 1 |

**EPA Freshwater Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA_WB34 | 10/23/12 | 10/23/12 | 1 | 0 | 9.6 | 9.6 | 0 | 0 | 0 | 0 |
| EPA_WB34 | 07/09/13 | 09/25/13 | 2 | 1 | 20.8 | 16.2 | 1 | 0 | 0 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_WB34 | 10/23/12 | 10/23/12 | 1 | 7.5 | 7.5 | 0 | 0 |
| EPA_WB34 | 07/09/13 | 09/25/13 | 2 | 6.8 | 7.4 | 0 | 0 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**EPA Freshwater Nutrient Enrichment Indicator Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | DO Sat Max (%) | pH Max (SU) |
|---|---|---|---|---|---|---|---|
| EPA_WB34 | 2012 | -- | -- | -- | -- | 82.4 | 7.5 |
| EPA_WB34 | 2013 | -- | -- | -- | -- | 54.5 | 7.4 |

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

**EPA Discrete Specific Conductance Data (2012-2013, 2016-2019) Compared to Estimated Chloride Criteria.** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_WB34 | 10/23/12 | 10/23/12 | 1 | 114 | 114 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_WB34 | 07/09/13 | 09/25/13 | 2 | 116 | 126 | 0 | 0 | 0 | 0 | 0 | 0 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH, therefore the Fish Consumption Use for Bliss Brook (MA53-19), is Not Assessed. | |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No data are available to assess the status of the Aesthetic Use for Bliss Brook (MA53-19), so it is Not Assessed. | |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria data were collected in Bliss Brook (MA53-19) towards the downstream end of the AU at Ash Street (EPA_WB34), Rehoboth, during the summer of 2012 and 2013. The available bacteria data are too limited to assess the Primary Contact Recreational Use for Bliss Brook according to the CALM "Use Attainment Impairment Decision Schema"; consequently, the Primary Contact Recreational Use for the brook will continue to be assessed as Not Supporting with the existing *E. coli* impairment being carried forward. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_WB34 | Environmental Protection Agency | Water Quality | Bliss Brook | Bliss Brook @ Ash Street, Rehoboth | 41.885179 | -71.264872 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_WB34 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 64 | 64 | 64 |
| EPA_WB34 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 80 | 663 | 230 |

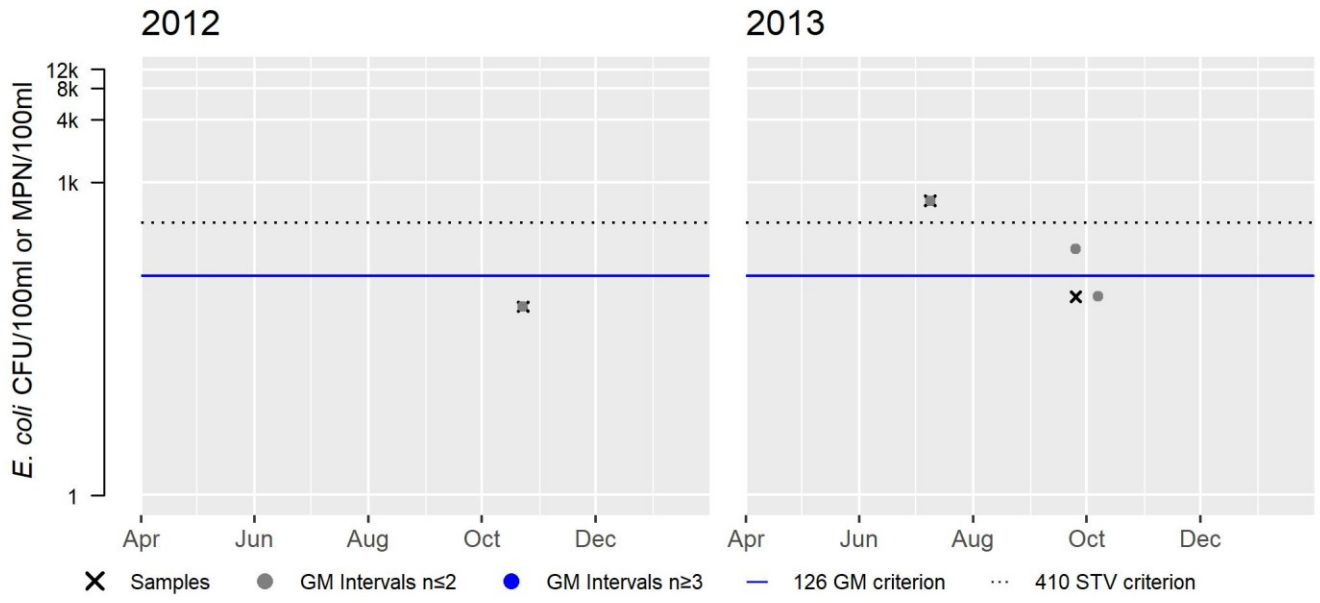
EPA_WB34 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 64 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 230 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |




## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|
| Insufficient Information | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria data were collected in Bliss Brook (MA53-19) towards the downstream end of the AU at Ash Street (EPA_WB34), Rehoboth, during the summer of 2012 and 2013. The available bacteria data are too limited to assess the Secondary Contact Recreational Use for Bliss Brook according to the CALM "Use Attainment Impairment Decision Schema"; consequently, Bliss Brook is assessed as having Insufficient Information available to make a Secondary Contact Recreational Use assessment decision. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_WB34 | Environmental Protection Agency | Water Quality | Bliss Brook | Bliss Brook @ Ash Street, Rehoboth | 41.885179 | -71.264872 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_WB34 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 64 | 64 | 64 |
| EPA_WB34 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 80 | 663 | 230 |

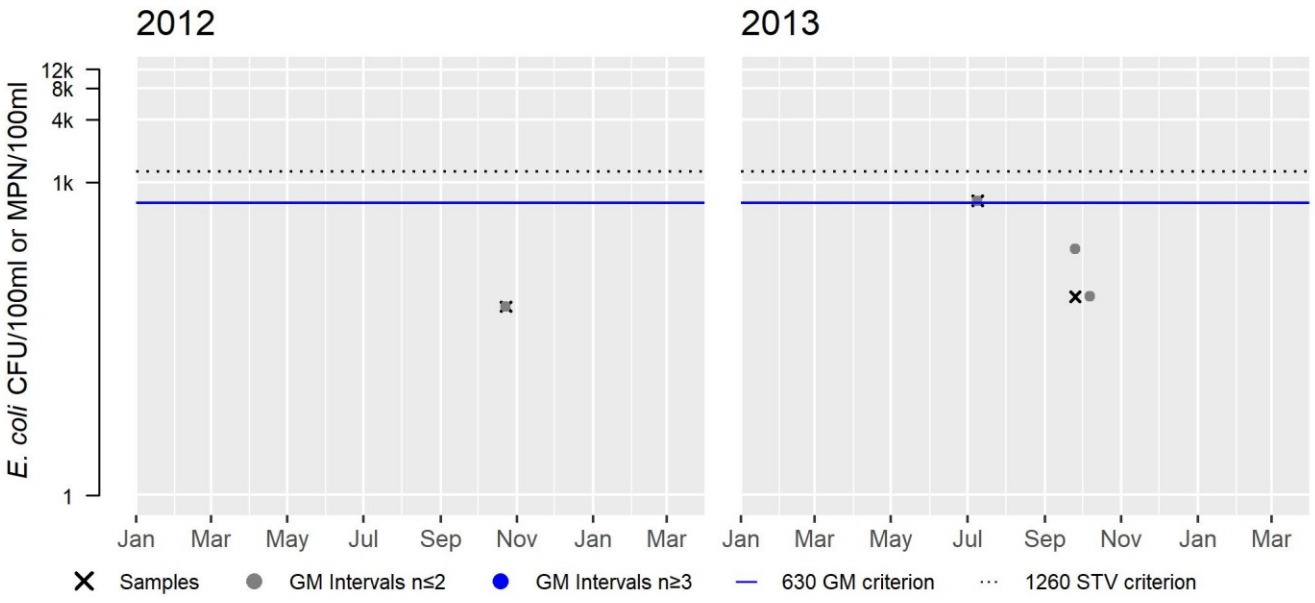
## EPA_WB34 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 64 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 230 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |

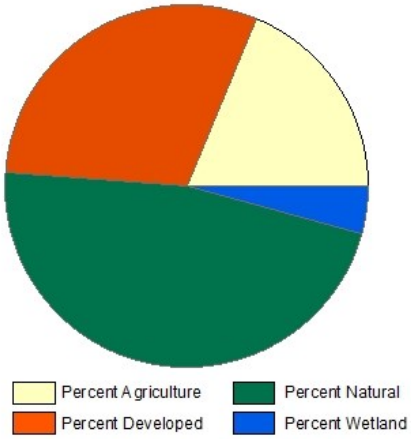


# Clear Run Brook (MA53-13)

| | |
|---|---|
| **Location:** | Headwaters, outlet unnamed pond northwest of Miller Street, Seekonk to confluence with Palmer River, Rehoboth. |
| **AU Type:** | RIVER |
| **AU Size:** | 1.6 MILES |
| **Classification/Qualifier:** | B |

**Clear Run Brook - MA53-13**

Watershed Area: 1.66 square miles




| Landuse Type | Entire Basin | 5km Radius Proximal Subbasin | 100m Stream Buffer | Proximal Stream Buffer |
|---|---|---|---|---|
| Land Use Area (square miles) | 1.66 | 1.66 | 0.49 | 0.49 |
| Agriculture | 18.7% | 18.7% | 28.8% | 28.8% |
| Developed | 30.1% | 30.1% | 15.4% | 15.4% |
| Natural | 47% | 47% | 45.7% | 45.7% |
| Wetland | 4.2% | 4.2% | 10.1% | 10.1% |
| Impervious Cover | 11.3% | | | |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 5 | 5 | Benthic Macroinvertebrates | | Added |
| 5 | 5 | Dissolved Oxygen | | Unchanged |
| 5 | 5 | Escherichia Coli (E. Coli) | 35097 | Unchanged |
| 5 | 5 | Fecal Coliform | 35097 | Unchanged |

| Impairment | Source (Confirmed Y/N) | Fish, other Aquatic Life and Wildlife | Fish Consumption | Aesthetic | Primary Contact Recreation | Secondary Contact Recreation |
|---|---|---|---|---|---|---|
| Benthic Macroinvertebrates | Source Unknown (N) | X | | | | |
| Dissolved Oxygen | Source Unknown (N) | X | | | | |
| Escherichia Coli (E. Coli) | Agriculture (Y) | | | | X | X |
| Escherichia Coli (E. Coli) | Waterfowl (N) | | | | X | X |
| Fecal Coliform | Agriculture (Y) | | | | X | |
| Fecal Coliform | Waterfowl (N) | | | | X | |

## Recommendations

| 2022 Recommendations |
|---|
| ALU: Conduct additional water quality monitoring in Clear Run Brook to better evaluate whether nutrient enrichment is problematic (deployed probes, pH, nutrients). Additional sampling to evaluate potential total ammonia nitrogen toxicity (specifically including pH and temperature measurements when total ammonia nitrogen sampling is conducted) at the upper end of Clear Run Brook (outlet of pond upstream of Miller Street). |

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | YES |

| 2022 Use Attainment Summary |
|---|
| Water quality monitoring was conducted at four sites along Clear Run Brook by EPA and MassDEP staff from up to downstream as follows: Miller St. (EPA_CR01), downstream of Miller St, Seekonk (MassDEP W2383, B0842, fish SampleID 5077), Miller St. (near Town line) (EPA_CR02), and Providence St. (EPA_CR03). Data summaries are provided here. MassDEP biologists conducted biological (benthic and fish) and water quality sampling downstream of Miller St, Seekonk as part of the MAP2 monitoring project during the summer of 2013. The benthic sample (B0842) IBI score was indicative of severely degraded conditions (19) while this low-moderate gradient habitat fish sample (SampleID 5077) included one fluvial taxon (tessellated darter) which comprised 27% of the sample and 58% of the sample was comprised of intolerant/moderately tolerant macrohabitat generalist fishes. Water quality monitoring data during the summer of 2013 (W2383) can be summarized as follows: the minimum DO was 4.2mg/L (30-day mean always <6.0mg/L during the continuous probe deployment from June to August), the maximum temperature was 27.8°C (7-DADM always <27.7°C, max 24hr rolling average 26.2°C during the continuous probe deployment from June to September), discrete pH measurements ranged from 6.7 to 7.0SU (n=3), while there were no physico-chemical indicators of nutrient enrichment issues (max diel DO shift 1.8mg/L, max DO saturation only 74.2%) and there were no observations of dense/very dense filamentous algae, the seasonal average total phosphorus concentration was high at 0.136mg/L (n=4, max 0.2mg/L). Specific conductance and chloride concentrations were both low (max 308µS/cm, and 39mg/L, respectively, n=3), as was total ammonia-nitrogen (TAN) (max 0.74mg/L, n=3 with no toxicity estimated), nor were there any acute or chronic metals criteria exceedances (n=3). EPA discrete water quality monitoring data were collected ~monthly 2012-2019. The maximum temperature was 29°C (n=44 measurements in the summer index period with two >28.3°C at the most upstream site (EPA_CR01 at outlet of a small pond where the flow was very slow), the minimum DO was 2.3mg/L (only one of seven measurements <5mg/L at EPA_CR02). The seasonal average total phosphorus concentrations at the three sites ranged from 0.08 to 0.57mg/L with a clear pattern of increase moving downstream (highest concentrations at EPA_CR03). DO saturation was high once (158.1%) at the most upstream site (EPA_CR01) though was much lower all other times (72-115%), pH 6.4-9.0SU (n=6) (>8.8SU once, also at EPA_CR01). Specific conductance was low (max 530µS/cm, n=102). Total ammonia-nitrogen concentrations ranged from 0.33-0.40mg/L (n=27) and while four screening level exceedances were calculated at EPA_CR01, in fact there were insufficient pH data available to calculate actual criteria/exceedances. The Aquatic Life Use of Clear Run Brook will continue to be assessed as Not Supporting with the DO impairment being carried forward. A new impairment for benthic macroinvertebrates is being added. An Alert is also being identified because of a few indicators of nutrient enrichment and the elevated total phosphorus concentrations in the brook. |

#### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| 5077 | MassDEP | Fish Community | Clear Run Brook | ~1750 ft DS/SE of Miller St xing, adj to russel dr, blacksmith rd. | 41.80069 | -71.30434 |

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| B0842 | MassDEP | Benthic | Clear Run Brook/ | [approximately 535 meters downstream/southeast from Miller Street, Seekonk, MA] | 41.800693 | -71.304341 |
| W0621 | MassDEP | Water Quality | Clear Run Brook | [Miller Street crossing (nearest the Rehoboth town line), Seekonk] | 41.805818 | -71.297692 |
| W0622 | MassDEP | Water Quality | Clear Run Brook | [Providence Street, Rehoboth] | 41.810221 | -71.291692 |
| W1531 | MassDEP | Water Quality | Clear Run Brook | [Miller Street crossing nearest Fieldwood Avenue, Seekonk] | 41.802721 | -71.309281 |
| W2383 | MassDEP | Water Quality | Clear Run Brook | [approximately 1750 feet downstream/southeast from Miller Street, Seekonk] | 41.800693 | -71.304341 |

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_CR01 | Environmental Protection Agency | Water Quality | Clear Run Brook | Clear Run Brook @ Miller Street crossing below pond nearest Fieldwood Avenue, Seekonk | 41.802679 | -71.309187 |
| EPA_CR02 | Environmental Protection Agency | Water Quality | Clear Run Brook | Clear Run Brook @ Miller Street crossing (nearest the Rehoboth town line), Seekonk | 41.805811 | -71.297687 |
| EPA_CR03 | Environmental Protection Agency | Water Quality | Clear Run Brook | Clear Run Brook @ Providence Street, Rehoboth | 41.810224 | -71.291907 |

## *Biological Monitoring Information*

### Benthic Macroinvertebrate Data

**MassDEP Benthic Macroinvertebrate Data (2011-2017).** (MassDEP Undated 4)

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

| Station Code | Collection Date | Collection Method | Index Type | Organism Count | Index Score | Index Biological Condition Class |
|---|---|---|---|---|---|---|
| B0842 | 07/10/13 | RBP multihab | Statewide_Low_Gradient | 313 | 19 | SD |

### Fish Community Data and DELTS

**Fish Community Data (2012-2019) Provided by MassDFG.** (MassDFG 2020) (MassDEP Undated 2)

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

[Species List: AE = American Eel, BS = Banded Sunfish, LMB = Largemouth Bass, P = Pumpkinseed, TD = Tesselated Darter]

| Sample ID | Sample Date | Method | Sample Type | Gradient | Total Taxa | Total Ind | Cold Ind % | Fluvial Taxa | Fluvial Ind % | Intol Ind % | I/MT MG Taxa | I/MT MG Ind % | Notables | CFR | Species List |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5077 | 09/17/13 | NS | TP | | 5 | 45 | 0% | 1 | 27% | 11% | 3 | 58% | Yes | No | AE, BS, LMB, P, TD, |

## Habitat and Flow Data (anthropogenic alterations)

**EPA Discrete Total Suspended Solids Data (2016-2019).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | TSS Count | TSS Max (mg/L) | TSS Avg (mg/L) | TSS Count >25 |
|---|---|---|---|---|---|---|
| EPA_CR01 | 04/19/16 | 11/09/16 | 8 | 18 | 7 | 0 |
| EPA_CR01 | 04/20/17 | 11/14/17 | 8 | 13 | 5.7 | 0 |
| EPA_CR01 | 04/24/18 | 11/05/18 | 8 | 8.5 | 4.1 | 0 |
| EPA_CR01 | 04/29/19 | 11/06/19 | 6 | 13 | 5.3 | 0 |
| EPA_CR02 | 04/19/16 | 11/09/16 | 8 | 16 | 7.7 | 0 |
| EPA_CR02 | 04/20/17 | 11/14/17 | 8 | 31 | 6.7 | 1 |
| EPA_CR02 | 04/24/18 | 11/05/18 | 8 | 8.5 | 3.6 | 0 |
| EPA_CR02 | 06/26/19 | 11/06/19 | 6 | 5 | 3.4 | 0 |
| EPA_CR03 | 04/19/16 | 11/09/16 | 8 | 42 | 10.1 | 1 |
| EPA_CR03 | 04/20/17 | 11/14/17 | 8 | 48 | 13 | 2 |
| EPA_CR03 | 04/24/18 | 11/05/18 | 8 | 15 | 4.9 | 0 |
| EPA_CR03 | 04/29/19 | 11/06/19 | 7 | 10 | 5.5 | 0 |

### *Physico-chemical Water Quality Information*

## DO, pH, Temperature

**MassDEP Long-term Continuous Dissolved Oxygen Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Start Date | End Date | Day Count | 7day Count | 30day Count | DO Min (mg/L) | Min 7DADMin (mg/L) | Min 7DADA (mg/L) | Delta DO Max (mg/L) | Count CW 7DADMin <6.0 | Count CW 1Day Min <5.0 | Count WW Early Life Stages 7DADA <6.5 | Count WW Early Life Stages 1Day Min <5.0 | Count WW Other Life Stages 7DADMin <5.0 | Count WW Other Life Stages 1Day Min <4.0 | Count CW 30DADA <8.0 | Count WW Other Life Stages 30DADA <6.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W2383 | 06/20/13 | 08/05/13 | 47 | 41 | 18 | 4.2 | 4.7 | 5.1 | 1.8 | 37 | 12 | 36 | 11 | 8 | 0 | 18 | 18 |

**MassDEP Discrete Dissolved Oxygen Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| W2383 | 06/19/13 | 10/02/13 | 2 | 5.3 | 5.8 | 0 | 0 | 0 |

**MassDEP Long-term Continuous Temperature Data (Summer Index 2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Start Date | End Date | Index Count | 7day Count | Max Daily Mean (°C) | Max Temp (°C) | Max 7DADM (°C) | Max 7DADA (°C) | Count CWTier1 7DADM >20 | Count CWTier1 Daily Mean >23.5 | Count CWTier2 7DADA >21 | Count CWTier2 Daily Mean >24.1 | Count WW 7DADM >27.7 | Count WW Daily Mean >28.3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W2383 | 06/20/13 | 09/15/13 | 88 | 85 | 25.9 | 27.6 | 26.9 | 25.4 | 81 | 19 | 48 | 15 | 0 | 0 |
| W2383 | 06/20/13 | 09/15/13 | 88 | 85 | 26.0 | 27.8 | 27.0 | 25.5 | 82 | 19 | 50 | 15 | 0 | 0 |

**24-hour Rolling Average Calculations for MassDEP Short- and Long-term Continuous Temperature Data (Summer Index 2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Start Date | End Date | Count Days Deployed | 24hr Rolling Count | Max 24hr Avg Rolling Temp (°C) | Count CWTier1 24hr Avg Rolling >23.5 °C | Count CWTier2 24hr Avg Rolling >24.1 °C | Count WW 24hr Avg Rolling >28.3°C |
|---|---|---|---|---|---|---|---|---|
| W2383 | 06/19/13 | 09/15/13 | 88 | 4195 | 26.2 | 898 | 754 | 0 |
| W2383 | 06/19/13 | 09/15/13 | 88 | 4195 | 26.1 | 881 | 735 | 0 |

**MassDEP Discrete Temperature Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| W2383 | 06/19/13 | 10/02/13 | 5 | 3 | 22.9 | 20.1 | 2 | 2 | 0 | 0 |

**MassDEP Discrete pH Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 & >8.3 | pH Count <6.0 & >8.8 |
|---|---|---|---|---|---|---|---|
| W2383 | 06/19/13 | 10/02/13 | 3 | 6.7 | 7 | 0 | 0 |

**EPA Freshwater Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| EPA_CR01 | 10/23/12 | 10/23/12 | 1 | 16.6 | 16.6 | 0 | 0 | 0 |
| EPA_CR01 | 07/09/13 | 09/25/13 | 2 | 6.4 | 8.5 | 0 | 0 | 0 |
| EPA_CR02 | 10/23/12 | 10/23/12 | 1 | 12.6 | 12.6 | 0 | 0 | 0 |
| EPA_CR02 | 07/09/13 | 09/25/13 | 2 | 2.3 | 4.8 | 1 | 1 | 1 |

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| EPA_CR03 | 10/23/12 | 10/23/12 | 1 | 7.7 | 7.7 | 0 | 0 | 0 |

**EPA Freshwater Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA_CR01 | 10/23/12 | 10/23/12 | 1 | 0 | 13.3 | 13.3 | 0 | 0 | 0 | 0 |
| EPA_CR01 | 07/09/13 | 09/25/13 | 2 | 1 | 27.8 | 21.9 | 1 | 1 | 0 | 0 |
| EPA_CR01 | 04/19/16 | 11/09/16 | 8 | 4 | 29.0 | 17.8 | 3 | 2 | 1 | 0 |
| EPA_CR01 | 04/20/17 | 11/14/17 | 8 | 4 | 26.4 | 18.9 | 4 | 4 | 0 | 0 |
| EPA_CR01 | 04/24/18 | 11/05/18 | 8 | 3 | 28.7 | 18.3 | 2 | 2 | 1 | 0 |
| EPA_CR01 | 04/29/19 | 11/06/19 | 8 | 3 | 26.0 | 17.7 | 3 | 3 | 0 | 0 |
| EPA_CR02 | 10/23/12 | 10/23/12 | 1 | 0 | 11.0 | 11.0 | 0 | 0 | 0 | 0 |
| EPA_CR02 | 07/09/13 | 09/25/13 | 2 | 1 | 24.0 | 18.9 | 1 | 1 | 0 | 0 |
| EPA_CR02 | 04/19/16 | 11/09/16 | 8 | 4 | 24.7 | 15.2 | 2 | 2 | 0 | 0 |
| EPA_CR02 | 04/20/17 | 11/14/17 | 8 | 4 | 22.7 | 16.5 | 3 | 1 | 0 | 0 |
| EPA_CR02 | 04/24/18 | 11/05/18 | 8 | 3 | 23.9 | 15.4 | 1 | 1 | 0 | 0 |
| EPA_CR02 | 04/29/19 | 11/06/19 | 8 | 3 | 21.7 | 15.0 | 3 | 0 | 0 | 0 |
| EPA_CR03 | 10/23/12 | 10/23/12 | 1 | 0 | 12.3 | 12.3 | 0 | 0 | 0 | 0 |
| EPA_CR03 | 04/19/16 | 11/09/16 | 8 | 4 | 24.1 | 13.7 | 1 | 1 | 0 | 0 |
| EPA_CR03 | 04/20/17 | 11/14/17 | 8 | 4 | 21.2 | 15.4 | 3 | 0 | 0 | 0 |
| EPA_CR03 | 04/24/18 | 11/05/18 | 8 | 3 | 22.2 | 14.3 | 1 | 1 | 0 | 0 |
| EPA_CR03 | 04/29/19 | 11/06/19 | 8 | 3 | 19.7 | 14.1 | 0 | 0 | 0 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_CR01 | 07/09/13 | 09/25/13 | 2 | 6.9 | 9.0 | 1 | 1 |
| EPA_CR02 | 10/23/12 | 10/23/12 | 1 | 7.5 | 7.5 | 0 | 0 |
| EPA_CR02 | 07/09/13 | 09/25/13 | 2 | 6.4 | 7.3 | 1 | 0 |
| EPA_CR03 | 10/23/12 | 10/23/12 | 1 | 6.9 | 6.9 | 0 | 0 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**MassDEP Nutrient Enrichment Indicator Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | Delta DO Max (mg/L) | Delta DO Avg (mg/L) | DO Sat Max (%) | pH Max (SU) | Count Algal Obsv. | Dense/V. Dense Film/Fila. Algae |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W0621 | 2015 | -- | -- | -- | -- | -- | -- | -- | -- | 2 | 0 |

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | Delta DO Max (mg/L) | Delta DO Avg (mg/L) | DO Sat Max (%) | pH Max (SU) | Count Algal Obsv. | Dense/V. Dense Film/Fila. Algae |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W0622 | 2013 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |
| W0622 | 2015 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |
| W1531 | 2015 | -- | -- | -- | -- | -- | -- | -- | -- | 2 | 0 |
| W2383 | 2013 | 4 | 0.092 | 0.200 | 0.136 | 1.8 | 0.7 | 74.2 | 7.0 | 8 | 0 |

**EPA Freshwater Nutrient Enrichment Indicator Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | DO Sat Max (%) | pH Max (SU) |
|---|---|---|---|---|---|---|---|
| EPA_CR01 | 2012 | -- | -- | -- | -- | 158.1 | -- |
| EPA_CR01 | 2013 | -- | -- | -- | -- | 108.0 | 9.0 |
| EPA_CR01 | 2016 | 5 | 0.068 | 0.240 | 0.152 | -- | -- |
| EPA_CR01 | 2017 | 5 | 0.040 | 0.200 | 0.093 | -- | -- |
| EPA_CR01 | 2018 | 5 | 0.026 | 0.130 | 0.081 | -- | -- |
| EPA_CR01 | 2019 | 5 | 0.003 | 0.250 | 0.140 | -- | -- |
| EPA_CR02 | 2012 | -- | -- | -- | -- | 114.7 | 7.5 |
| EPA_CR02 | 2013 | -- | -- | -- | -- | 88.0 | 7.3 |
| EPA_CR02 | 2016 | 5 | 0.130 | 0.210 | 0.164 | -- | -- |
| EPA_CR02 | 2017 | 5 | 0.100 | 0.250 | 0.174 | -- | -- |
| EPA_CR02 | 2018 | 5 | 0.120 | 0.450 | 0.252 | -- | -- |
| EPA_CR02 | 2019 | 5 | 0.005 | 0.400 | 0.263 | -- | -- |
| EPA_CR03 | 2012 | -- | -- | -- | -- | 71.8 | 6.9 |
| EPA_CR03 | 2016 | 5 | 0.130 | 0.320 | 0.214 | -- | -- |
| EPA_CR03 | 2017 | 5 | 0.150 | 0.350 | 0.276 | -- | -- |
| EPA_CR03 | 2018 | 5 | 0.210 | 1.500 | 0.570 | -- | -- |
| EPA_CR03 | 2019 | 5 | 0.005 | 0.700 | 0.355 | -- | -- |

**EPA Summer Seasonal Total Nitrogen Data (2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Total nitrogen data collected May-Sept]

| Station Code | Start Date | End Date | Seasonal TN Count | Seasonal TN Min (mg/L) | Seasonal TN Max (mg/L) | Seasonal TN Avg (mg/L) |
|---|---|---|---|---|---|---|
| EPA_CR01 | 05/17/16 | 09/13/16 | 5 | 0.4 | 1.4 | 0.8 |
| EPA_CR01 | 05/31/17 | 09/14/17 | 5 | 0.4 | 2.1 | 1.0 |
| EPA_CR01 | 05/09/18 | 09/19/18 | 5 | 0.4 | 1.6 | 0.9 |
| EPA_CR01 | 05/13/19 | 09/24/19 | 5 | 0.6 | 1.4 | 0.9 |
| EPA_CR02 | 05/17/16 | 09/13/16 | 5 | 0.6 | 2.5 | 1.6 |
| EPA_CR02 | 05/31/17 | 09/14/17 | 5 | 1.5 | 2.0 | 1.6 |
| EPA_CR02 | 05/09/18 | 09/19/18 | 5 | 0.7 | 1.9 | 1.2 |
| EPA_CR02 | 05/13/19 | 09/24/19 | 5 | 0.6 | 1.2 | 0.9 |
| EPA_CR03 | 05/17/16 | 09/13/16 | 5 | 0.5 | 1.5 | 0.9 |
| EPA_CR03 | 05/31/17 | 09/14/17 | 5 | 0.5 | 1.2 | 0.8 |
| EPA_CR03 | 05/09/18 | 09/19/18 | 5 | 0.5 | 0.9 | 0.7 |
| EPA_CR03 | 05/13/19 | 09/24/19 | 5 | 0.4 | 0.6 | 0.5 |

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

**MassDEP Clean Metals Water Column Data (2011-2018), Acute Criteria Violations.** (MassDEP Undated 8) (MassDEP Undated 5)

[CMC= Criterion Maximum Concentration, TU= Toxic Unit]

| Station Code | Data Year | Metals Count | As CMC TU >1 | Cd CMC TU >1 | Cr III CMC TU >1 | Cu CMC TU >1 | Pb CMC TU >1 | Ni CMC TU >1 | Ag CMC TU >1 | Zn CMC TU >1 |
|---|---|---|---|---|---|---|---|---|---|---|
| W2383 | 2013 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**MassDEP Clean Metals Water Column Data (2011-2018), Chronic Criteria Violations.** (MassDEP Undated 8) (MassDEP Undated 5)

[CCC= Criterion Continuous Concentration, TU= Toxic Unit]

| Station Code | Data Year | Metals Count | As CCC TU >1 | Cd CCC TU >1 | Cr III CCC TU >1 | Cu CCC TU >1 | Pb CCC TU >1 | Ni CCC TU >1 | Se CCC TU >1 | Zn CCC TU >1 |
|---|---|---|---|---|---|---|---|---|---|---|
| W2383 | 2013 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**MassDEP Clean Metals Water Column Data (2011-2018), Selected TU Calculations.** (MassDEP Undated 8) (MassDEP Undated 5)

[CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

| Station Code | Sample Date | Cd CMC TU | Cd CCC TU | Cu CMC TU | Cu CCC TU | Pb CMC TU | Pb CCC TU |
|---|---|---|---|---|---|---|---|
| W2383 | 06/04/13 | 0.2 | 0.5 | 0.2 | 0.23 | 0.0 | 0.8 |
| W2383 | 07/16/13 | 0.1 | 0.2 | 0.1 | 0.13 | 0.0 | 0.1 |
| W2383 | 08/26/13 | 0.1 | 0.3 | 0.1 | 0.17 | 0.0 | 0.1 |

**MassDEP Dissolved Aluminum Water Column Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[Since only dissolved aluminum data were available, these data were compared to the default freshwater criteria for total recoverable aluminum (TRA), presented in Appendix E of MassDEP's 2022 CALM. As dissolved Al is a fraction of TRA, an exceedance count of 0 does not rule out violations of the TRA criteria. CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

| Station Code | Data Year | Dissolved Al Count | Al Min (mg/L) | Al Max (mg/L) | Al Avg (mg/L) | Al CMC TU Max | Al CCC TU Max | Al CMC TU >1 | Al CCC TU >1 |
|---|---|---|---|---|---|---|---|---|---|
| W2383 | 2013 | 3 | 0.008 | 0.025 | 0.015 | 0.1 | 0.1 | 0 | 0 |

**MassDEP Total Ammonia Nitrogen (TAN) Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[TAN= NH3 + NH4+]

| Station Code | Data Year | TAN Count | TAN Min (mg/L) | TAN Max (mg/L) | TAN Avg (mg/L) | Count TAN >Chronic | Count TAN >Acute |
|---|---|---|---|---|---|---|---|
| W2383 | 2013 | 3 | 0.090 | 0.740 | 0.467 | 0 | 0 |

**MassDEP Chloride Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Chloride Count | Chloride Min (mg/L) | Chloride Max (mg/L) | Chloride Avg (mg/L) | Count Chloride >230 | Count Chloride >860 |
|---|---|---|---|---|---|---|---|
| W2383 | 2013 | 3 | 28 | 39 | 35 | 0 | 0 |

**MassDEP Discrete Specific Conductance Data (2011-2018) Compared to Estimated Chloride Criteria.** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W2383 | 06/19/13 | 10/02/13 | 3 | 196 | 308 | 0 | 0 | 0 | 0 | 0 | 0 |

**EPA Freshwater Total Ammonia Nitrogen (TAN) Data (2017 & 2019).** (EPA 2020) (MassDEP Undated 3)

[Toxicity evaluations made using site- and date-specific temperature plus site-specific max pH measurements from 2012 & 2013; TAN= $NH3 + NH_4^+$]

| Station Code | Start Date | End Date | TAN Count | TAN Min (mg/L) | TAN Max (mg/L) | TAN Avg (mg/L) | Count TAN >Chronic* | Count TAN >Acute |
|---|---|---|---|---|---|---|---|---|
| EPA_CR01 | 11/14/17 | 11/14/17 | 1 | 0.40 | 0.40 | 0.40 | 1 | 0 |
| EPA_CR01 | 04/29/19 | 11/06/19 | 8 | 0.07 | 0.33 | 0.17 | 3 | 0 |
| EPA_CR02 | 11/14/17 | 11/14/17 | 1 | 0.21 | 0.21 | 0.21 | 0 | 0 |
| EPA_CR02 | 04/29/19 | 11/06/19 | 8 | 0.07 | 0.37 | 0.18 | 0 | 0 |
| EPA_CR03 | 11/14/17 | 11/14/17 | 1 | 0.18 | 0.18 | 0.18 | 0 | 0 |
| EPA_CR03 | 04/29/19 | 11/06/19 | 8 | 0.07 | 0.41 | 0.16 | 0 | 0 |

* Note: there were insufficient pH data available to calculate site specific criteria. Any apparent exceedances are to be taken as "screening level" information only.

**EPA Discrete Specific Conductance Data (2012-2013, 2016-2019) Compared to Estimated Chloride Criteria.** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_CR01 | 10/23/12 | 10/23/12 | 1 | 217 | 217 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR01 | 07/09/13 | 09/25/13 | 2 | 242 | 279 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR01 | 04/19/16 | 11/09/16 | 8 | 156 | 285 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR01 | 04/20/17 | 11/14/17 | 8 | 192 | 294 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR01 | 04/24/18 | 11/05/18 | 8 | 175 | 408 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR01 | 04/29/19 | 11/06/19 | 8 | 155 | 256 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR02 | 10/23/12 | 10/23/12 | 1 | 248 | 248 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR02 | 07/09/13 | 09/25/13 | 2 | 143 | 389 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR02 | 04/19/16 | 11/09/16 | 7 | 244 | 318 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR02 | 04/20/17 | 11/14/17 | 8 | 219 | 303 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR02 | 04/24/18 | 11/05/18 | 8 | 190 | 282 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR02 | 04/29/19 | 11/06/19 | 8 | 168 | 314 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR03 | 10/23/12 | 10/23/12 | 1 | 211 | 211 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR03 | 04/19/16 | 11/09/16 | 8 | 227 | 380 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR03 | 04/20/17 | 11/14/17 | 8 | 130 | 312 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR03 | 04/24/18 | 11/05/18 | 8 | 197 | 300 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR03 | 04/29/19 | 11/06/19 | 8 | 174 | 530 | 0 | 0 | 0 | 0 | 0 | 0 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH, therefore the Fish Consumption Use for Clear Run Brook (MA53-13), is Not Assessed. | |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | YES |
| **2022 Use Attainment Summary** | |
| MassDEP staff recorded aesthetics observations at four sites along Clear Run Brook between the summers of 2013 and 2015 as follows: Miller Street crossing nearest Fieldwood Avenue, Seekonk (W1531) (2015), ~1750 feet downstream Miller Street, Seekonk (W2383) (2013), Miller Street crossing (nearest the Rehoboth town line), Seekonk (W0621) (2015), and Providence Street, Rehoboth (W0622) (2013). There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DWM-WPP field sampling crews during the surveys at most stations (n=22). The Aesthetics Use for Clear Run Brook is assessed as Fully Supporting but an Alert is being identified for notes of moderate turbidity during three of four site visits in the middle of the AU, at Miller Street crossing (nearest the Rehoboth town line), Seekonk (W0621) during the summer of 2015. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W0621 | MassDEP | Water Quality | Clear Run Brook | [Miller Street crossing (nearest the Rehoboth town line), Seekonk] | 41.805818 | -71.297692 |
| W0622 | MassDEP | Water Quality | Clear Run Brook | [Providence Street, Rehoboth] | 41.810221 | -71.291692 |
| W1531 | MassDEP | Water Quality | Clear Run Brook | [Miller Street crossing nearest Fieldwood Avenue, Seekonk] | 41.802721 | -71.309281 |
| W2383 | MassDEP | Water Quality | Clear Run Brook | [approximately 1750 feet downstream/southeast from Miller Street, Seekonk] | 41.800693 | -71.304341 |

### *Aesthetic Observations*

**Aesthetics Summary Statements for MassDEP Stations (2011-2018)** (MassDEP Undated 5)

| Station Code | Waterbody | Data Year | Field Sheet Count | Aesthetics Summary Statement |
|---|---|---|---|---|
| W0621 | Clear Run Brook | 2015 | 4 | The Aesthetics use for Clear Run Brook is assessed as Fully Supporting based on observations (generally no odors, deposits, or growths) by MassDEP staff during field surveys at station W0621 in summer 2015. However, the use is identified with an Alert status since the water was moderately turbid on 3 of 4 site visits. |

| Station Code | Waterbody | Data Year | Field Sheet Count | Aesthetics Summary Statement |
|---|---|---|---|---|
| W0622 | Clear Run Brook | 2013 | 2 | MassDEP aesthetics observations for station W0622 on Clear Run Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |
| W0622 | Clear Run Brook | 2015 | 4 | MassDEP aesthetics observations for station W0622 on Clear Run Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2015. |
| W1531 | Clear Run Brook | 2015 | 4 | MassDEP aesthetics observations for station W1531 on Clear Run Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2015. |
| W2383 | Clear Run Brook | 2013 | 8 | MassDEP aesthetics observations for station W2383/MAP2-363 on Clear Run Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. |

**Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018)** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Field Sheet Count | Field Sheet Count w/ Film & Filamentous Algae Observations | Dense/ Very Dense Film/ Filamentous Algae |
|---|---|---|---|---|
| W0621 | 2015 | 4 | 2 | 0 |
| W0622 | 2013 | 2 | 1 | 0 |
| W0622 | 2015 | 4 | 1 | 0 |
| W1531 | 2015 | 4 | 2 | 0 |
| W2383 | 2013 | 8 | 8 | 0 |

**MassDEP Aesthetics Observations (2011-2018)** (MassDEP Undated 8)

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W0621 | Clear Run Brook | 2015 | Color | None | 4 | 4 |
| W0621 | Clear Run Brook | 2015 | Objectionable Deposits | Not Applicable (N/A) | 4 | 4 |
| W0621 | Clear Run Brook | 2015 | Odor | None | 3 | 4 |
| W0621 | Clear Run Brook | 2015 | Odor | Other | 1 | 4 |
| W0621 | Clear Run Brook | 2015 | Scum | Not Applicable (N/A) | 4 | 4 |
| W0621 | Clear Run Brook | 2015 | Turbidity | Moderately Turbid | 3 | 4 |
| W0621 | Clear Run Brook | 2015 | Turbidity | Slightly Turbid | 1 | 4 |
| W0622 | Clear Run Brook | 2013 | Color | Light Yellow/Tan | 1 | 2 |
| W0622 | Clear Run Brook | 2013 | Color | None | 1 | 2 |
| W0622 | Clear Run Brook | 2013 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W0622 | Clear Run Brook | 2013 | Odor | None | 2 | 2 |
| W0622 | Clear Run Brook | 2013 | Scum | Not Applicable (N/A) | 2 | 2 |
| W0622 | Clear Run Brook | 2013 | Turbidity | Moderately Turbid | 1 | 2 |

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W0622 | Clear Run Brook | 2013 | Turbidity | Unobservable | 1 | 2 |
| W0622 | Clear Run Brook | 2015 | Color | None | 4 | 4 |
| W0622 | Clear Run Brook | 2015 | Objectionable Deposits | Not Applicable (N/A) | 4 | 4 |
| W0622 | Clear Run Brook | 2015 | Odor | None | 4 | 4 |
| W0622 | Clear Run Brook | 2015 | Scum | Not Applicable (N/A) | 4 | 4 |
| W0622 | Clear Run Brook | 2015 | Turbidity | Moderately Turbid | 1 | 4 |
| W0622 | Clear Run Brook | 2015 | Turbidity | Slightly Turbid | 3 | 4 |
| W1531 | Clear Run Brook | 2015 | Color | None | 4 | 4 |
| W1531 | Clear Run Brook | 2015 | Objectionable Deposits | Not Applicable (N/A) | 4 | 4 |
| W1531 | Clear Run Brook | 2015 | Odor | None | 4 | 4 |
| W1531 | Clear Run Brook | 2015 | Scum | Not Applicable (N/A) | 4 | 4 |
| W1531 | Clear Run Brook | 2015 | Turbidity | Moderately Turbid | 1 | 4 |
| W1531 | Clear Run Brook | 2015 | Turbidity | Slightly Turbid | 2 | 4 |
| W1531 | Clear Run Brook | 2015 | Turbidity | Unobservable | 1 | 4 |
| W2383 | Clear Run Brook | 2013 | Color | Light Yellow/Tan | 2 | 8 |
| W2383 | Clear Run Brook | 2013 | Color | None | 6 | 8 |
| W2383 | Clear Run Brook | 2013 | Objectionable Deposits | No | 7 | 8 |
| W2383 | Clear Run Brook | 2013 | Objectionable Deposits | Yes | 1 | 8 |
| W2383 | Clear Run Brook | 2013 | Odor | None | 8 | 8 |
| W2383 | Clear Run Brook | 2013 | Scum | No | 8 | 8 |
| W2383 | Clear Run Brook | 2013 | Turbidity | None | 7 | 8 |
| W2383 | Clear Run Brook | 2013 | Turbidity | Slightly Turbid | 1 | 8 |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | YES |

**2022 Use Attainment Summary**

*E. coli* (and occasionally *Enterococcus*) bacteria data were collected throughout the AU at the following sampling stations (data years): MassDEP 4-5 times per year in 2013 & 2015 at four sites along Clear Run Brook between the summers of 2013 and 2015 as follows: Miller Street crossing nearest Fieldwood Avenue, Seekonk (W1531) (2015), ~1750 feet downstream Miller Street, Seekonk (W2383) (2013), Miller Street crossing (nearest the Rehoboth town line), Seekonk (W0621) (2015), and Providence Street, Rehoboth (W0622) (2013). EPA 1-7 times per year in 2012, 2013, 2016-2019 at Miller Street crossing below pond nearest Fieldwood Avenue, Seekonk (EPA_CR01), Miller Street crossing (nearest the Rehoboth town line), Seekonk (EPA_CR02), and Providence Street, Rehoboth (EPA_CR03). Data analysis of these single and multi-year, low and moderate frequency *E. coli* datasets indicated generally poor water quality conditions (elevated bacteria) at the majority of sample stations as 100% of intervals (in most single year datasets) and 56-100% in four years (in most multi-year datasets) had GMs > 126 cfu/100ml, and two to three samples each year exceeded the 410 cfu/100ml STV in many of the sample years. The Primary Contact Recreational Use of Clear Run Brook will continue to be assessed as Not Supporting with the *E. coli* and Fecal coliform impairments being carried forward. An Alert is also being identified due to moderate turbidity during three of four site visits in the middle of the AU, at Miller Street crossing (nearest the Rehoboth town line), Seekonk (W0621) during the summer of 2015. The available *Enterococcus* data were too limited to assess the Primary Contact Recreational Use for this AU according to the CALM "Use Attainment Impairment Decision Schema".

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_CR01 | Environmental Protection Agency | Water Quality | Clear Run Brook | Clear Run Brook @ Miller Street crossing below pond nearest Fieldwood Avenue, Seekonk | 41.802679 | -71.309187 |
| EPA_CR02 | Environmental Protection Agency | Water Quality | Clear Run Brook | Clear Run Brook @ Miller Street crossing (nearest the Rehoboth town line), Seekonk | 41.805811 | -71.297687 |
| EPA_CR03 | Environmental Protection Agency | Water Quality | Clear Run Brook | Clear Run Brook @ Providence Street, Rehoboth | 41.810224 | -71.291907 |
| W0621 | MassDEP | Water Quality | Clear Run Brook | [Miller Street crossing (nearest the Rehoboth town line), Seekonk] | 41.805818 | -71.297692 |
| W0622 | MassDEP | Water Quality | Clear Run Brook | [Providence Street, Rehoboth] | 41.810221 | -71.291692 |
| W1531 | MassDEP | Water Quality | Clear Run Brook | [Miller Street crossing nearest Fieldwood Avenue, Seekonk] | 41.802721 | -71.309281 |
| W2383 | MassDEP | Water Quality | Clear Run Brook | [approximately 1750 feet downstream/southeast from Miller Street, Seekonk] | 41.800693 | -71.304341 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3) (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_CR01 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 202 | 202 | 202 |
| EPA_CR01 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 24 | 189 | 67 |
| EPA_CR01 | Environmental Protection Agency | E. coli | 04/19/16 | 10/12/16 | 7 | 4 | 114 | 24 |
| EPA_CR01 | Environmental Protection Agency | Enterococci | 04/19/16 | 04/19/16 | 1 | 10 | 10 | 10 |
| EPA_CR01 | Environmental Protection Agency | E. coli | 04/20/17 | 10/12/17 | 7 | 4 | 384 | 48 |
| EPA_CR01 | Environmental Protection Agency | E. coli | 04/24/18 | 10/18/18 | 7 | 4 | 384 | 26 |
| EPA_CR01 | Environmental Protection Agency | E. coli | 05/13/19 | 10/22/19 | 6 | 8 | 2747 | 203 |
| EPA_CR02 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 154 | 154 | 154 |
| EPA_CR02 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 526 | 1302 | 828 |
| EPA_CR02 | Environmental Protection Agency | E. coli | 04/19/16 | 10/12/16 | 7 | 22 | 839 | 231 |
| EPA_CR02 | Environmental Protection Agency | Enterococci | 04/19/16 | 04/19/16 | 1 | 10 | 10 | 10 |
| EPA_CR02 | Environmental Protection Agency | E. coli | 04/20/17 | 10/12/17 | 7 | 75 | 1741 | 344 |
| EPA_CR02 | Environmental Protection Agency | E. coli | 04/24/18 | 10/18/18 | 7 | 34 | 3266 | 243 |
| EPA_CR02 | Environmental Protection Agency | E. coli | 05/13/19 | 10/22/19 | 6 | 108 | 7945 | 594 |

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_CR03 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 12 | 12 | 12 |
| EPA_CR03 | Environmental Protection Agency | E. coli | 04/19/16 | 10/12/16 | 7 | 59 | 717 | 215 |
| EPA_CR03 | Environmental Protection Agency | Enterococci | 04/19/16 | 04/19/16 | 1 | 41 | 41 | 41 |
| EPA_CR03 | Environmental Protection Agency | E. coli | 04/20/17 | 10/12/17 | 7 | 25 | 362 | 92 |
| EPA_CR03 | Environmental Protection Agency | E. coli | 04/24/18 | 10/18/18 | 7 | 21 | 1549 | 195 |
| EPA_CR03 | Environmental Protection Agency | E. coli | 05/13/19 | 10/22/19 | 6 | 110 | 9678 | 528 |
| W0621 | MassDEP | E. coli | 05/07/15 | 07/21/15 | 4 | 47 | 24196 | 1095 |
| W0622 | MassDEP | E. coli | 05/06/13 | 09/09/13 | 2 | 432 | 512 | 470 |
| W0622 | MassDEP | E. coli | 05/07/15 | 07/21/15 | 4 | 44 | 24196 | 516 |
| W1531 | MassDEP | E. coli | 05/07/15 | 07/21/15 | 4 | 2 | 4880 | 182 |
| W2383 | MassDEP | E. coli | 05/30/13 | 09/23/13 | 5 | 110 | 404 | 231 |

## EPA_CR01 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 202 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 67 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 24 |
| #GMI | 6 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

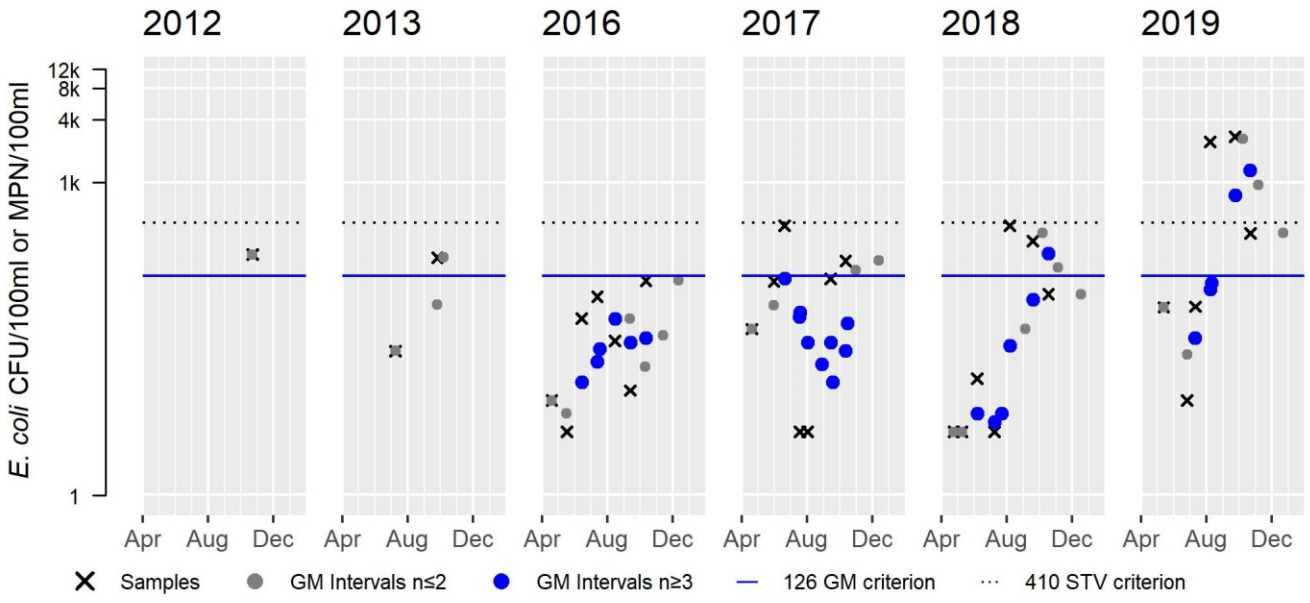
| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 48 |
| #GMI | 9 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 26 |
| #GMI | 6 |
| #GMI Ex | 1 |
| %GMI Ex | 17 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 6 |
| SeasGM | 203 |
| #GMI | 5 |
| #GMI Ex | 2 |
| %GMI Ex | 40 |
| n>STV | 2 |
| %n>STV | 33 |

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

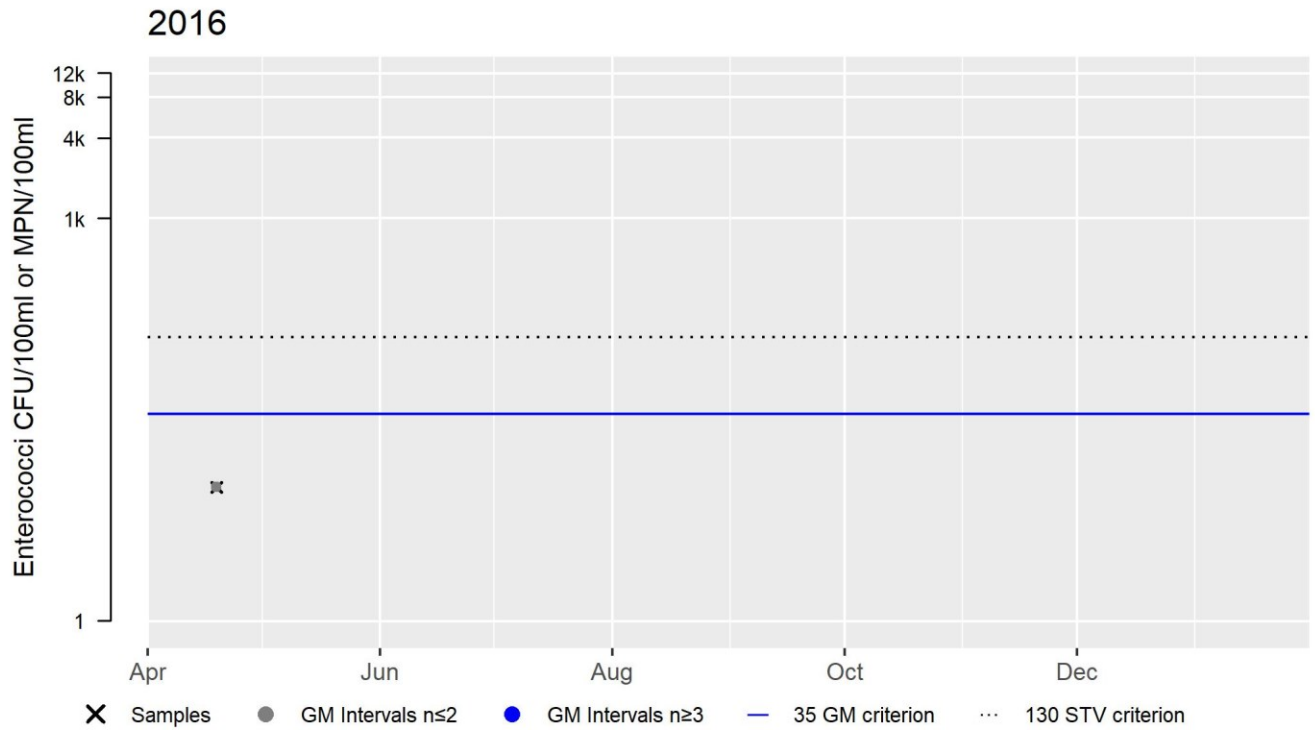
| *Variable* | Cumulative %GMI Ex (all years) | Cumulative %GMI Ex (last 5 years) |
|---|---|---|
| *Result* | 12 | 12 |



## EPA_CR01 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 10 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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



## EPA_CR02 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 154 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 828 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 2 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 231 |
| #GMI | 6 |
| #GMI Ex | 5 |
| %GMI Ex | 83 |
| n>STV | 3 |
| %n>STV | 43 |

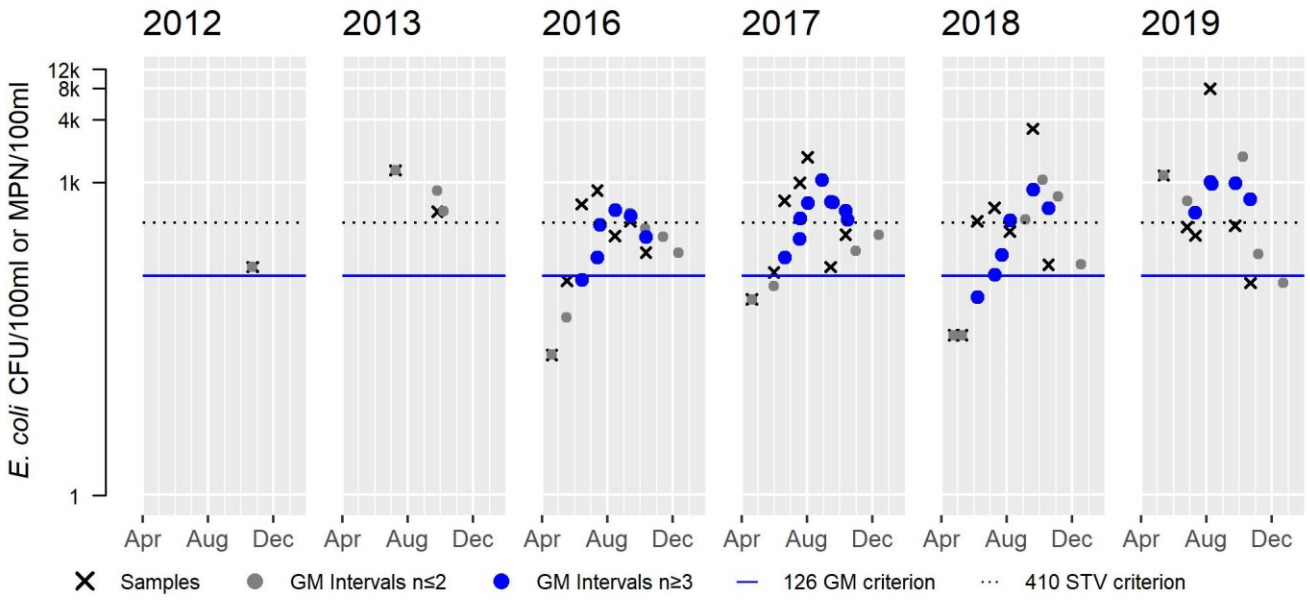
| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 344 |
| #GMI | 9 |
| #GMI Ex | 9 |
| %GMI Ex | 100 |
| n>STV | 3 |
| %n>STV | 43 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 243 |
| #GMI | 6 |
| #GMI Ex | 5 |
| %GMI Ex | 83 |
| n>STV | 3 |
| %n>STV | 43 |

| Var | Res |
|---|---|
| Samples | 6 |
| SeasGM | 594 |
| #GMI | 5 |
| #GMI Ex | 5 |
| %GMI Ex | 100 |
| n>STV | 2 |
| %n>STV | 33 |

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

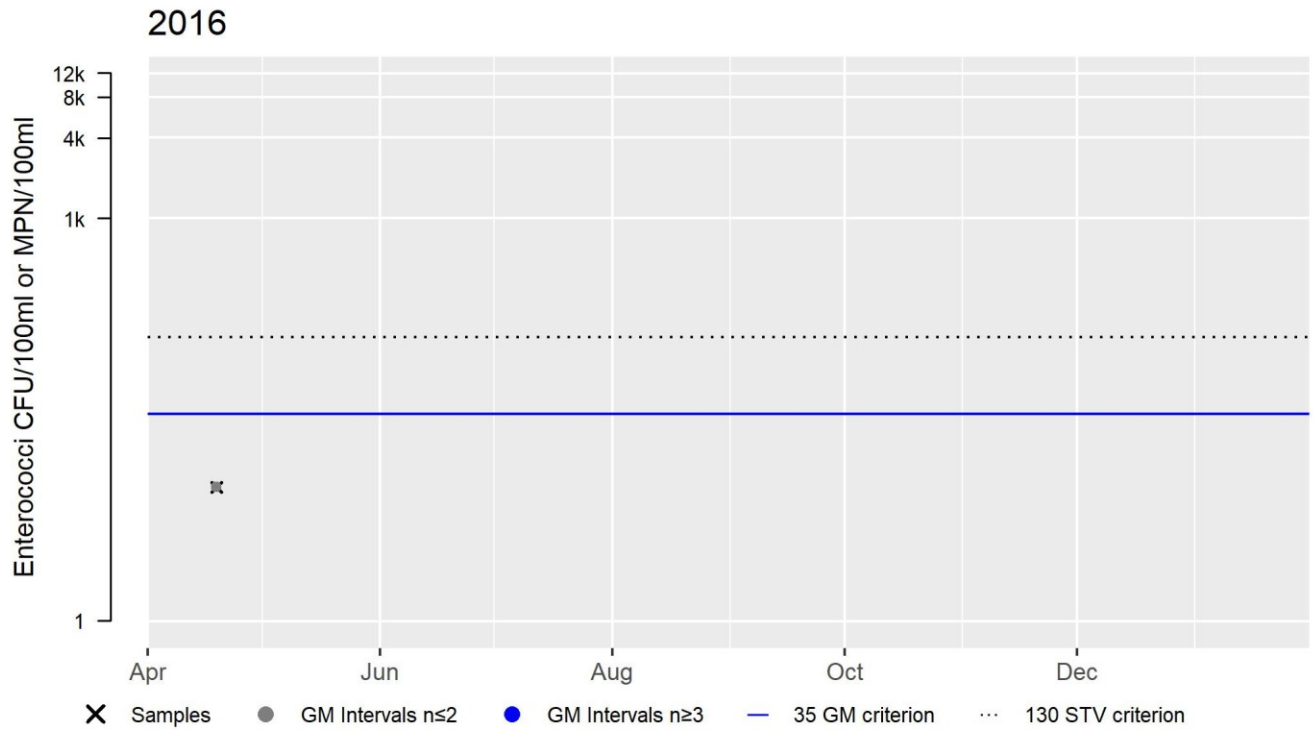
| *Variable* | Cumulative %GMI Ex (all years) | Cumulative %GMI Ex (last 5 years) |
|---|---|---|
| *Result* | 92 | 92 |



## EPA_CR02 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 10 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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



## EPA_CR03 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 12 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 215 |
| #GMI | 6 |
| #GMI Ex | 6 |
| %GMI Ex | 100 |
| n>STV | 2 |
| %n>STV | 29 |

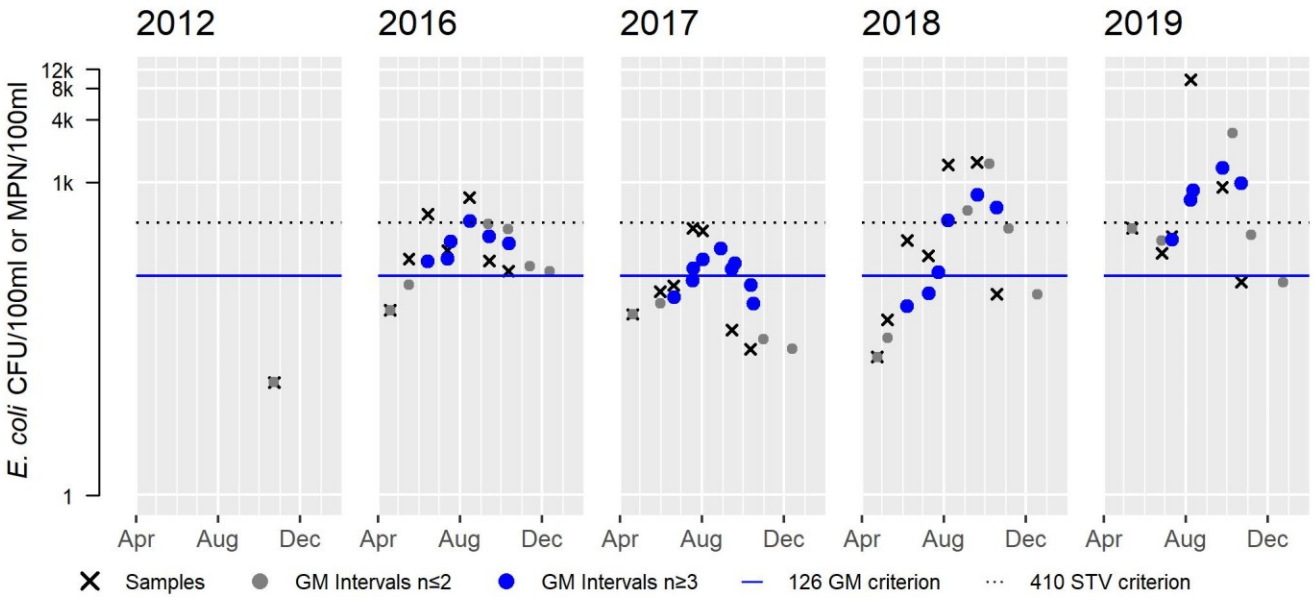
| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 92 |
| #GMI | 9 |
| #GMI Ex | 5 |
| %GMI Ex | 56 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 195 |
| #GMI | 6 |
| #GMI Ex | 4 |
| %GMI Ex | 67 |
| n>STV | 2 |
| %n>STV | 29 |

| Var | Res |
|---|---|
| Samples | 6 |
| SeasGM | 528 |
| #GMI | 5 |
| #GMI Ex | 5 |
| %GMI Ex | 100 |
| n>STV | 2 |
| %n>STV | 33 |

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

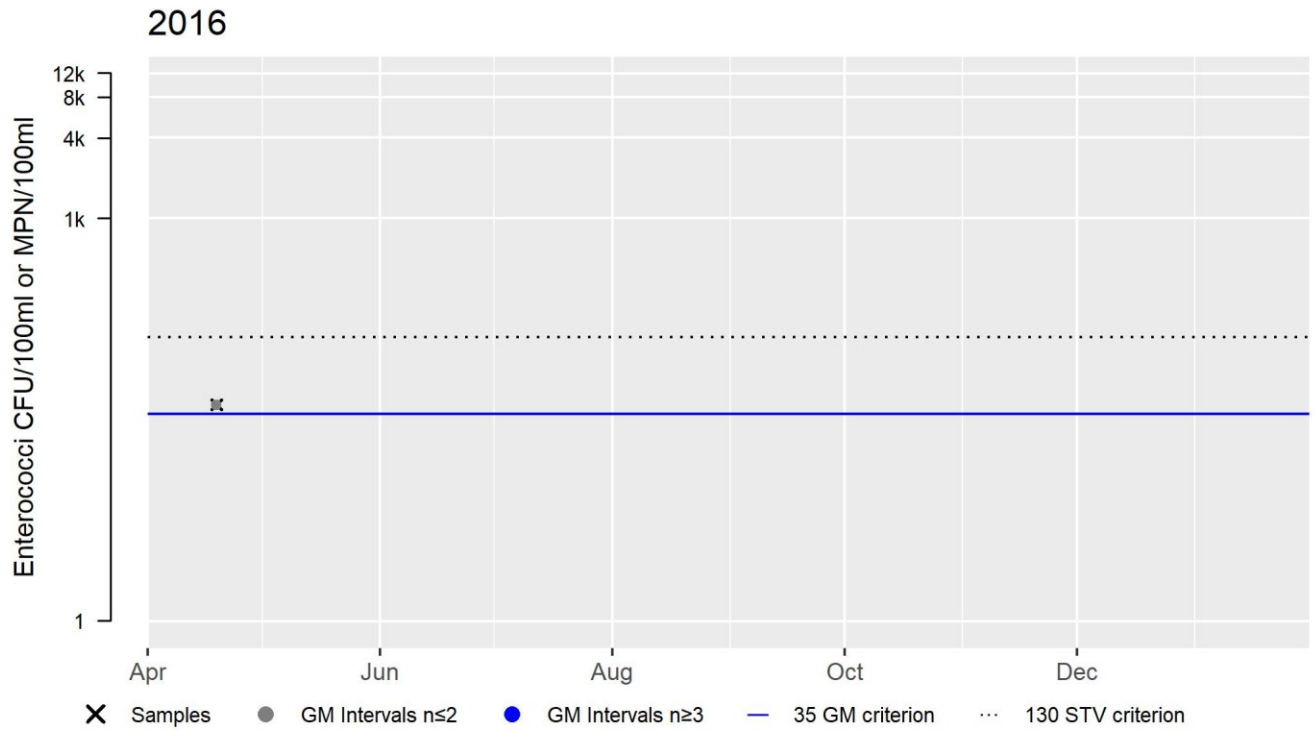
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 77 |



## EPA_CR03 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 41 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

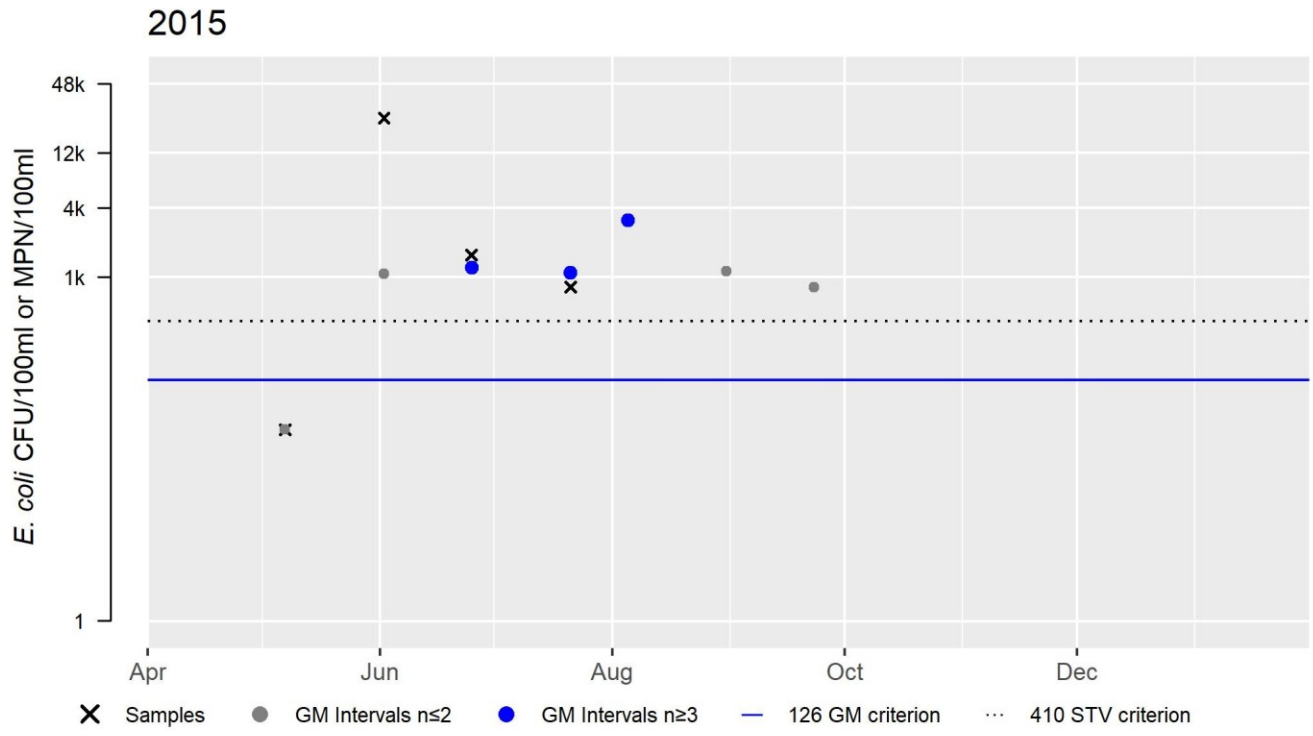
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



## W0621 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 4 |
| SeasGM | 1095 |
| #GMI | 3 |
| #GMI Ex | 3 |
| %GMI Ex | 100 |
| n>STV | 3 |
| %n>STV | 75 |

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



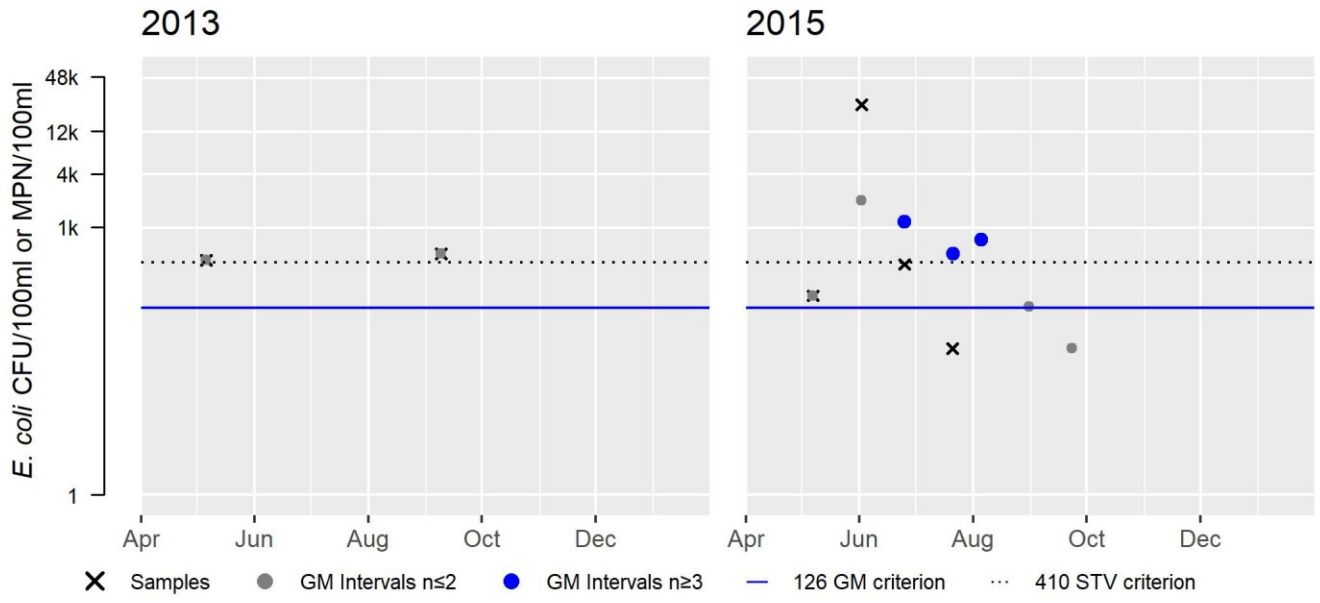
## W0622 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 470 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 2 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 4 |
| SeasGM | 516 |
| #GMI | 3 |
| #GMI Ex | 3 |
| %GMI Ex | 100 |
| n>STV | 1 |
| %n>STV | 25 |

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

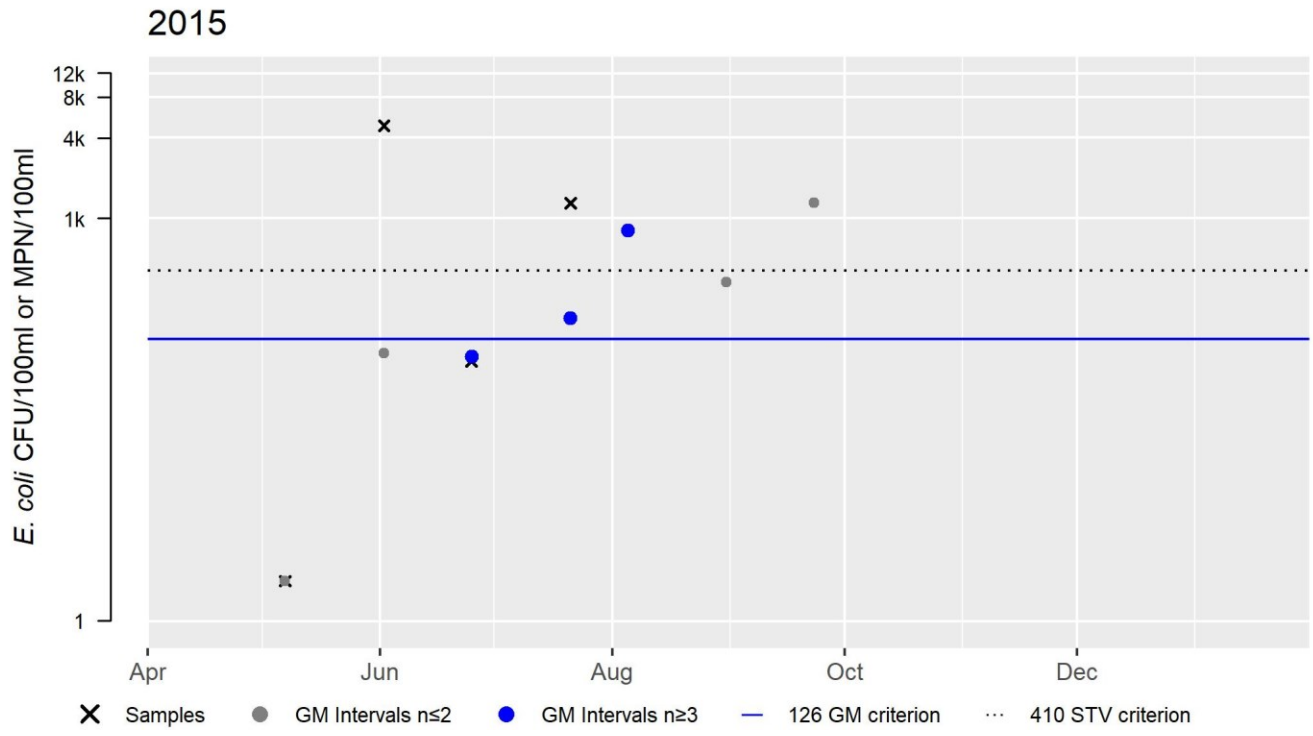
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 100 |



## W1531 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 4 |
| SeasGM | 182 |
| #GMI | 3 |
| #GMI Ex | 2 |
| %GMI Ex | 67 |
| n>STV | 2 |
| %n>STV | 50 |

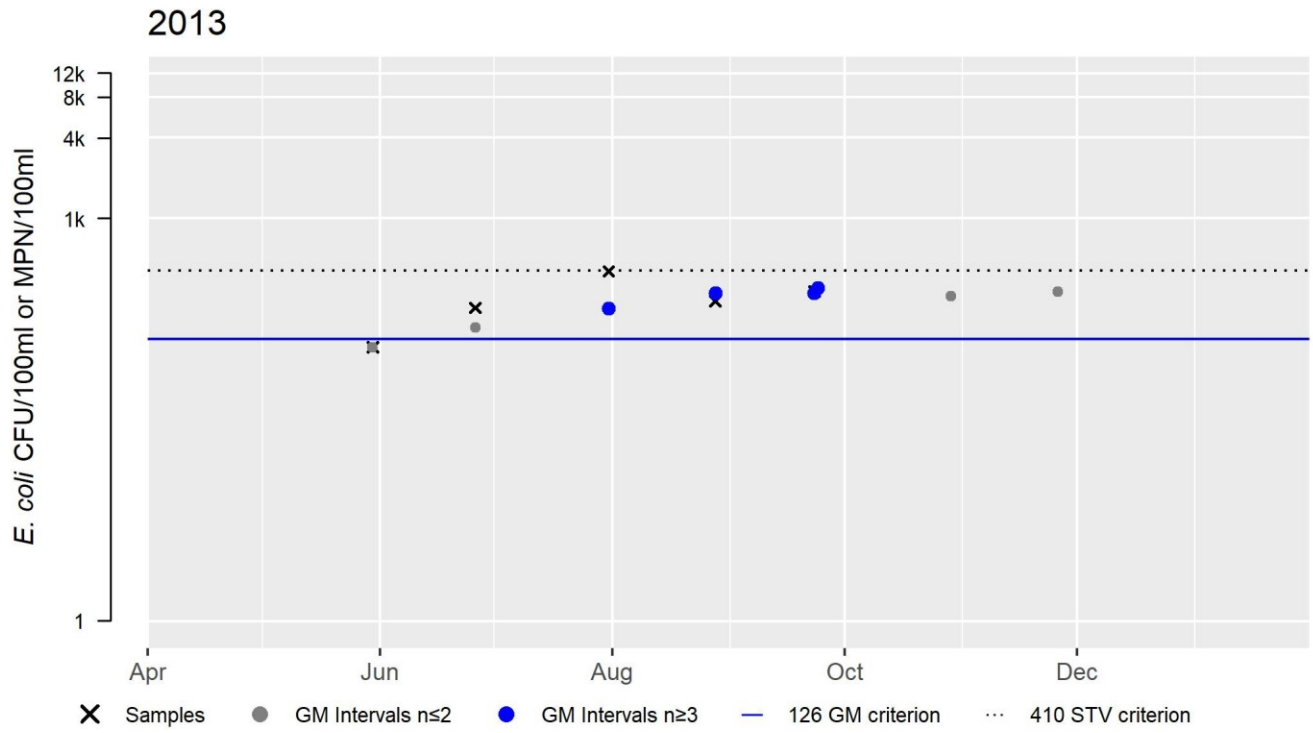
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



W2383 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 5 |
| SeasGM | 231 |
| #GMI | 4 |
| #GMI Ex | 4 |
| %GMI Ex | 100 |
| n>STV | 0 |
| %n>STV | 0 |

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




**MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019** (MassDEP Undated 1)

| **Summary** |
|---|
| Prior to 2011, BST work was conducted along the Clear Run Brook AU (MA53-13), with a max dry weather *E. coli* count of 1,986MPN in the middle of the AU at Miller Street. Additional BST work was conducted in 2013 and 2015 at 3 sites along Clear Run Brook, with *E. coli* counts ranging 2 to 24,196MPN. The highest counts were recorded in the middle and downstream end of the AU (Providence Street). It was noted that there is heavy agricultural land-use upstream of Providence Street, which may explain the elevated counts at this location. |

## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|
| Not Supporting | YES |
| **2022 Use Attainment Summary** | |

*E. coli* bacteria data were collected throughout the AU at the following sampling stations (data years): MassDEP 4-5 times per year in 2013 & 2015 at four sites along Clear Run Brook between the summers of 2013 and 2015 as follows: Miller Street crossing nearest Fieldwood Avenue, Seekonk (W1531) (2015), ~1750 feet downstream Miller Street, Seekonk (W2383) (2013), Miller Street crossing (nearest the Rehoboth town line), Seekonk (W0621) (2015), and Providence Street, Rehoboth (W0622) (2013). EPA 1-7 times per year in 2012, 2013, 2016-2019 at Miller Street crossing below pond nearest Fieldwood Avenue, Seekonk (EPA_CR01), Miller Street crossing (nearest the Rehoboth town line), Seekonk (EPA_CR02), and Providence Street, Rehoboth (EPA_CR03). Data analysis of these single and multi-year, low and moderate frequency *E. coli* datasets indicated generally good water quality conditions at the upstream and downstream ends of the AU; however, analysis of the data collected in the middle of the AU at Miller Street by MassDEP (W0621) and EPA (CR02) indicated 100% of intervals had GMs >630 cfu/100ml for the single year dataset and for the multi-year dataset 30% and 67% of intervals had GMs >630 cfu/100ml in two years, and 26% of the cumulative intervals had GMs >630 cfu/100ml. The Secondary Contact Recreational Use for Clear Run Brook is assessed as Not Supporting based on the elevated *E. coli* bacteria counts in the brook at Miller Street. An Alert is also being identified due to moderate turbidity during three of four site visits in the middle of the AU, at Miller Street crossing (nearest the Rehoboth town line), Seekonk (W0621) during the summer of 2015.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_CR01 | Environmental Protection Agency | Water Quality | Clear Run Brook | Clear Run Brook @ Miller Street crossing below pond nearest Fieldwood Avenue, Seekonk | 41.802679 | -71.309187 |
| EPA_CR02 | Environmental Protection Agency | Water Quality | Clear Run Brook | Clear Run Brook @ Miller Street crossing (nearest the Rehoboth town line), Seekonk | 41.805811 | -71.297687 |
| EPA_CR03 | Environmental Protection Agency | Water Quality | Clear Run Brook | Clear Run Brook @ Providence Street, Rehoboth | 41.810224 | -71.291907 |
| W0621 | MassDEP | Water Quality | Clear Run Brook | [Miller Street crossing (nearest the Rehoboth town line), Seekonk] | 41.805818 | -71.297692 |
| W0622 | MassDEP | Water Quality | Clear Run Brook | [Providence Street, Rehoboth] | 41.810221 | -71.291692 |
| W1531 | MassDEP | Water Quality | Clear Run Brook | [Miller Street crossing nearest Fieldwood Avenue, Seekonk] | 41.802721 | -71.309281 |
| W2383 | MassDEP | Water Quality | Clear Run Brook | [approximately 1750 feet downstream/southeast from Miller Street, Seekonk] | 41.800693 | -71.304341 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3) (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_CR01 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 202 | 202 | 202 |
| EPA_CR01 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 24 | 189 | 67 |

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_CR01 | Environmental Protection Agency | E. coli | 04/19/16 | 11/09/16 | 8 | 4 | 152 | 30 |
| EPA_CR01 | Environmental Protection Agency | E. coli | 04/20/17 | 11/14/17 | 8 | 4 | 2318 | 77 |
| EPA_CR01 | Environmental Protection Agency | E. coli | 04/24/18 | 11/05/18 | 8 | 4 | 432 | 37 |
| EPA_CR01 | Environmental Protection Agency | E. coli | 05/13/19 | 11/06/19 | 7 | 8 | 2747 | 174 |
| EPA_CR02 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 154 | 154 | 154 |
| EPA_CR02 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 526 | 1302 | 828 |
| EPA_CR02 | Environmental Protection Agency | E. coli | 04/19/16 | 11/09/16 | 8 | 22 | 839 | 188 |
| EPA_CR02 | Environmental Protection Agency | E. coli | 04/20/17 | 11/14/17 | 8 | 75 | 1741 | 379 |
| EPA_CR02 | Environmental Protection Agency | E. coli | 04/24/18 | 11/05/18 | 8 | 34 | 3266 | 240 |
| EPA_CR02 | Environmental Protection Agency | E. coli | 05/13/19 | 11/06/19 | 7 | 108 | 7945 | 639 |
| EPA_CR03 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 12 | 12 | 12 |
| EPA_CR03 | Environmental Protection Agency | E. coli | 04/19/16 | 11/09/16 | 8 | 43 | 717 | 176 |
| EPA_CR03 | Environmental Protection Agency | E. coli | 04/20/17 | 11/14/17 | 8 | 25 | 749 | 120 |
| EPA_CR03 | Environmental Protection Agency | E. coli | 04/24/18 | 11/05/18 | 8 | 21 | 1549 | 196 |
| EPA_CR03 | Environmental Protection Agency | E. coli | 05/13/19 | 11/06/19 | 7 | 110 | 9678 | 486 |
| W0621 | MassDEP | E. coli | 05/07/15 | 07/21/15 | 4 | 47 | 24196 | 1095 |
| W0622 | MassDEP | E. coli | 05/06/13 | 09/09/13 | 2 | 432 | 512 | 470 |
| W0622 | MassDEP | E. coli | 05/07/15 | 07/21/15 | 4 | 44 | 24196 | 516 |
| W1531 | MassDEP | E. coli | 05/07/15 | 07/21/15 | 4 | 2 | 4880 | 182 |
| W2383 | MassDEP | E. coli | 05/30/13 | 09/23/13 | 5 | 110 | 404 | 231 |

## EPA_CR01 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 202 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 67 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 30 |
| #GMI | 8 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

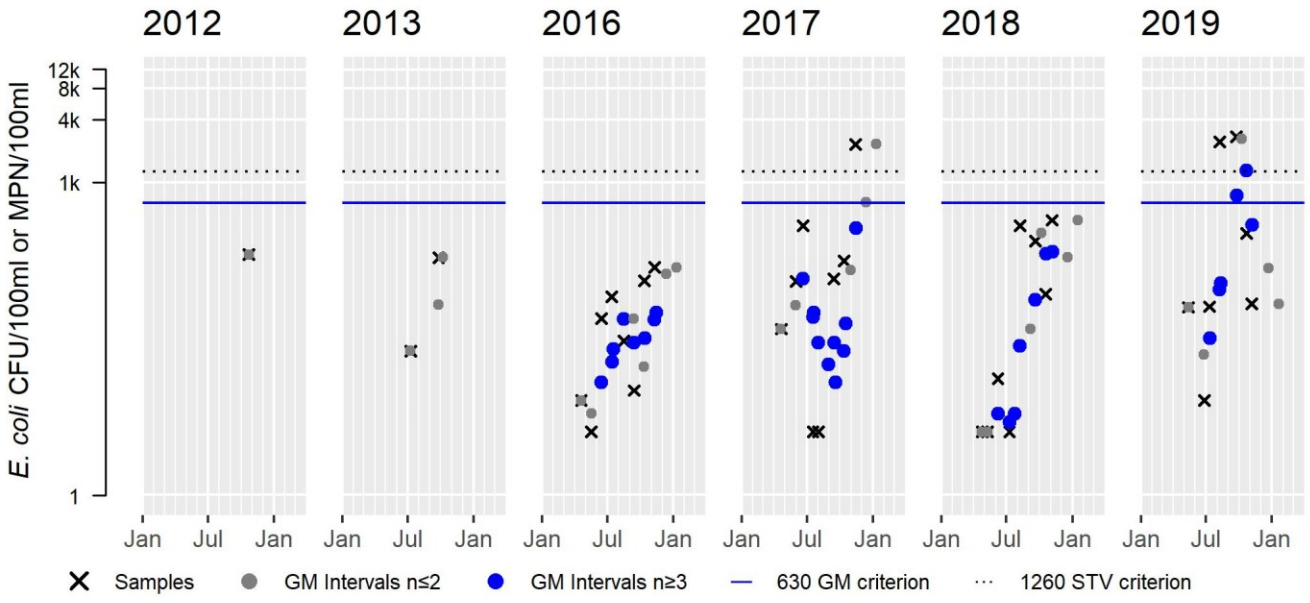
| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 77 |
| #GMI | 10 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 12 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 37 |
| #GMI | 7 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 174 |
| #GMI | 6 |
| #GMI Ex | 2 |
| %GMI Ex | 33 |
| n>STV | 2 |
| %n>STV | 29 |

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

| *Variable* | Cumulative %GMI Ex (all years) | Cumulative %GMI Ex (last 5 years) |
|---|---|---|
| *Result* | 6 | 6 |



## EPA_CR02 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 154 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 828 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 188 |
| #GMI | 8 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

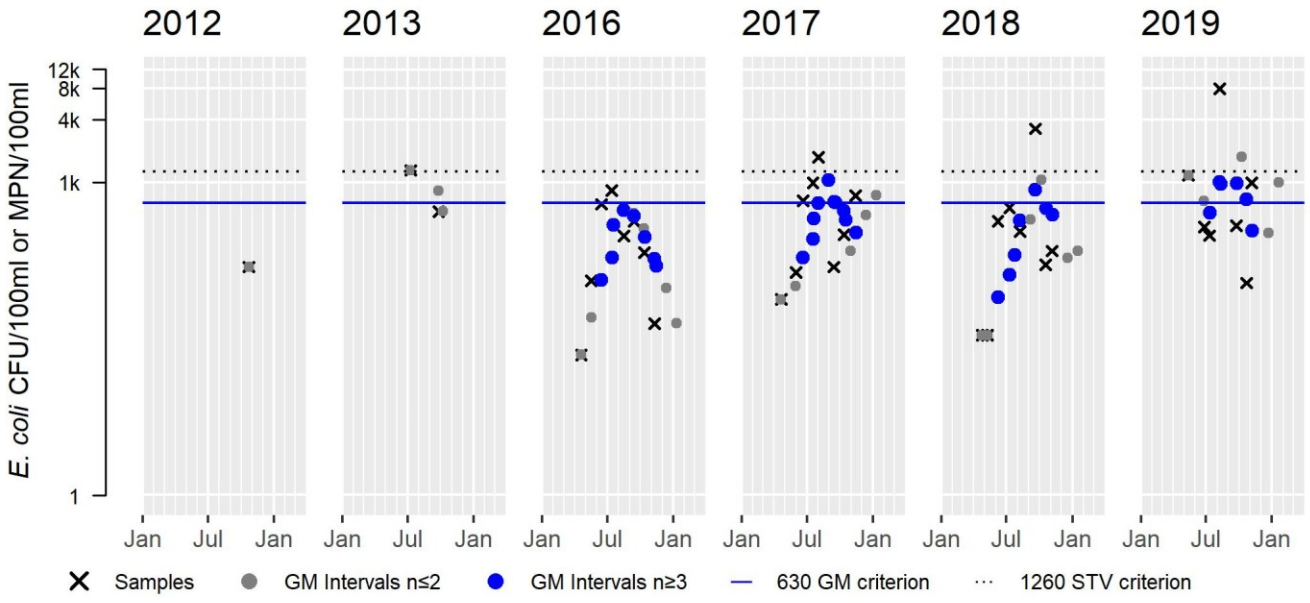
| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 379 |
| #GMI | 10 |
| #GMI Ex | 3 |
| %GMI Ex | 30 |
| n>STV | 1 |
| %n>STV | 12 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 240 |
| #GMI | 7 |
| #GMI Ex | 1 |
| %GMI Ex | 14 |
| n>STV | 1 |
| %n>STV | 12 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 639 |
| #GMI | 6 |
| #GMI Ex | 4 |
| %GMI Ex | 67 |
| n>STV | 1 |
| %n>STV | 14 |

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

| *Variable* | Cumulative %GMI Ex (all years) | Cumulative %GMI Ex (last 5 years) |
|---|---|---|
| *Result* | 26 | 26 |



## EPA_CR03 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 12 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 176 |
| #GMI | 8 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

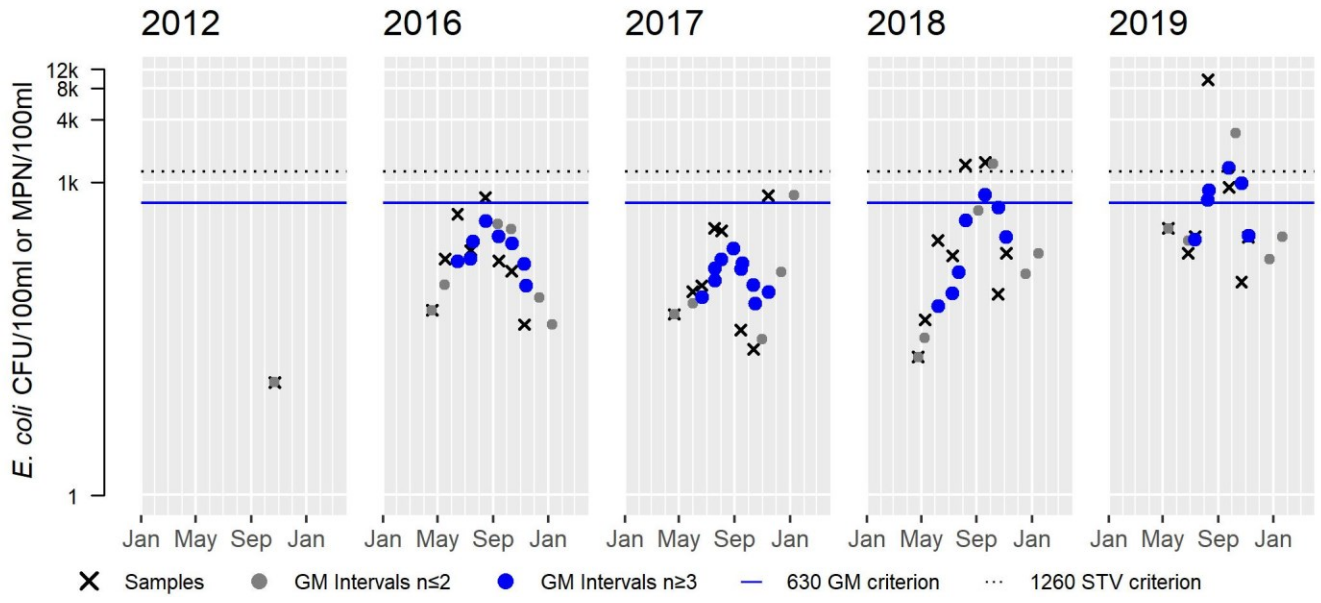
| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 120 |
| #GMI | 10 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 196 |
| #GMI | 7 |
| #GMI Ex | 1 |
| %GMI Ex | 14 |
| n>STV | 2 |
| %n>STV | 25 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 486 |
| #GMI | 6 |
| #GMI Ex | 4 |
| %GMI Ex | 67 |
| n>STV | 1 |
| %n>STV | 14 |

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

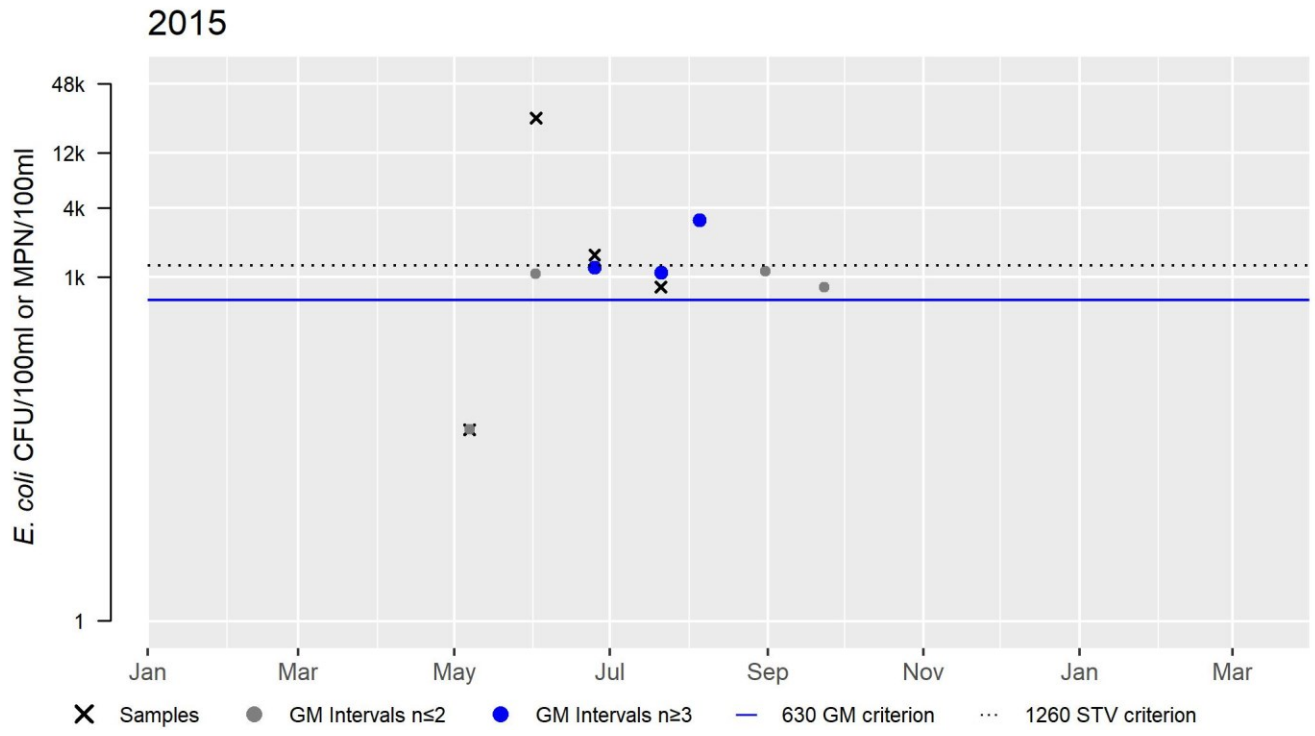
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 16 |



## W0621 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 4 |
| SeasGM | 1095 |
| #GMI | 3 |
| #GMI Ex | 3 |
| %GMI Ex | 100 |
| n>STV | 2 |
| %n>STV | 50 |

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



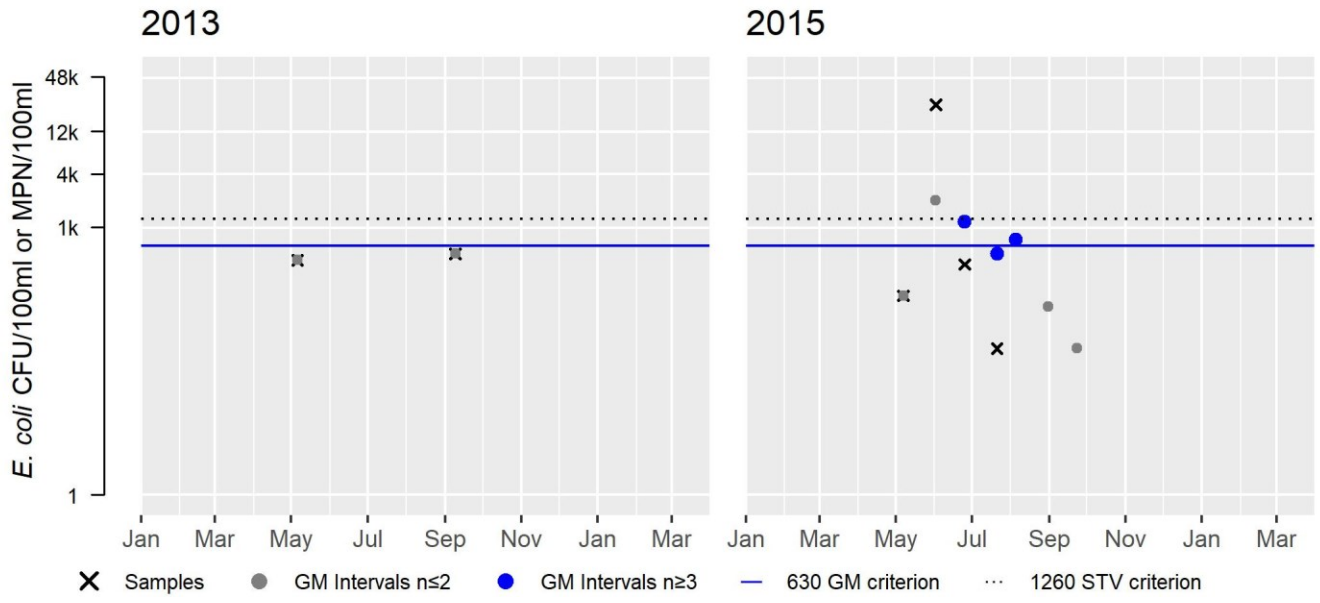
## W0622 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 470 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 4 |
| SeasGM | 516 |
| #GMI | 3 |
| #GMI Ex | 2 |
| %GMI Ex | 67 |
| n>STV | 1 |
| %n>STV | 25 |

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

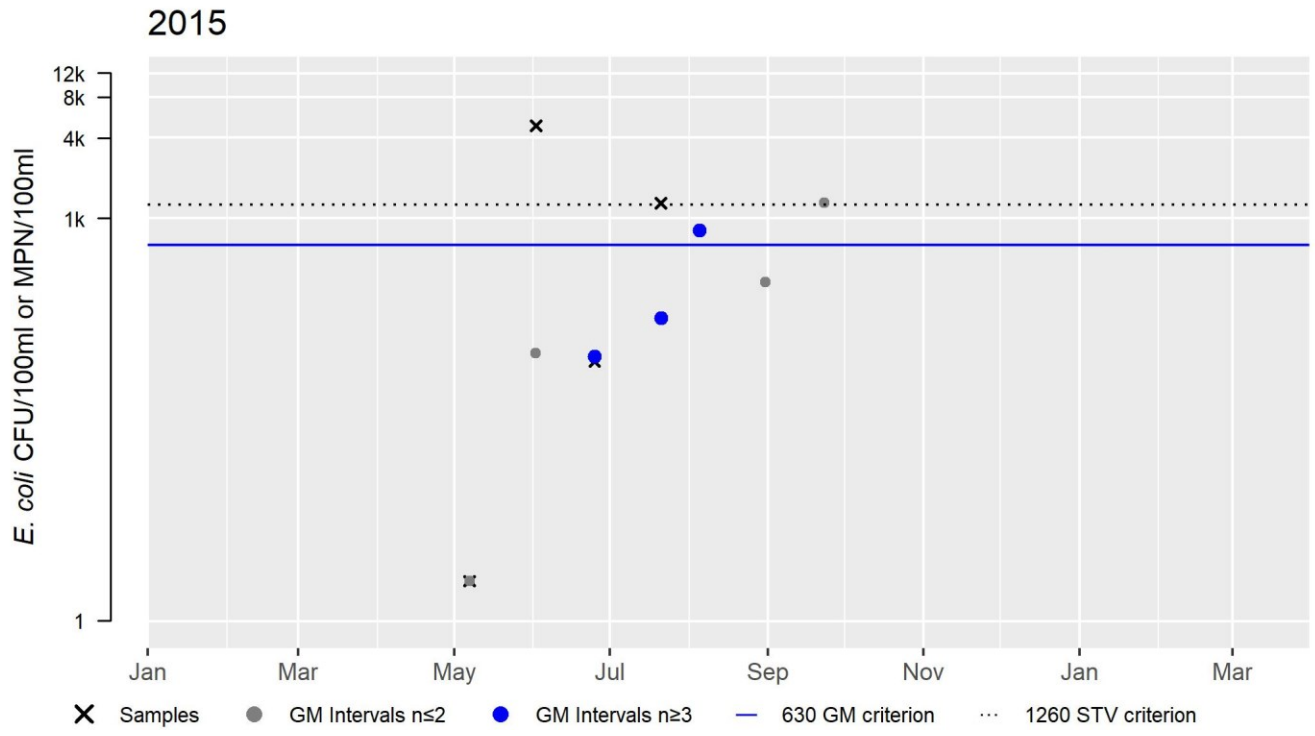
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 67 |



## W1531 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 4 |
| SeasGM | 182 |
| #GMI | 3 |
| #GMI Ex | 1 |
| %GMI Ex | 33 |
| n>STV | 2 |
| %n>STV | 50 |

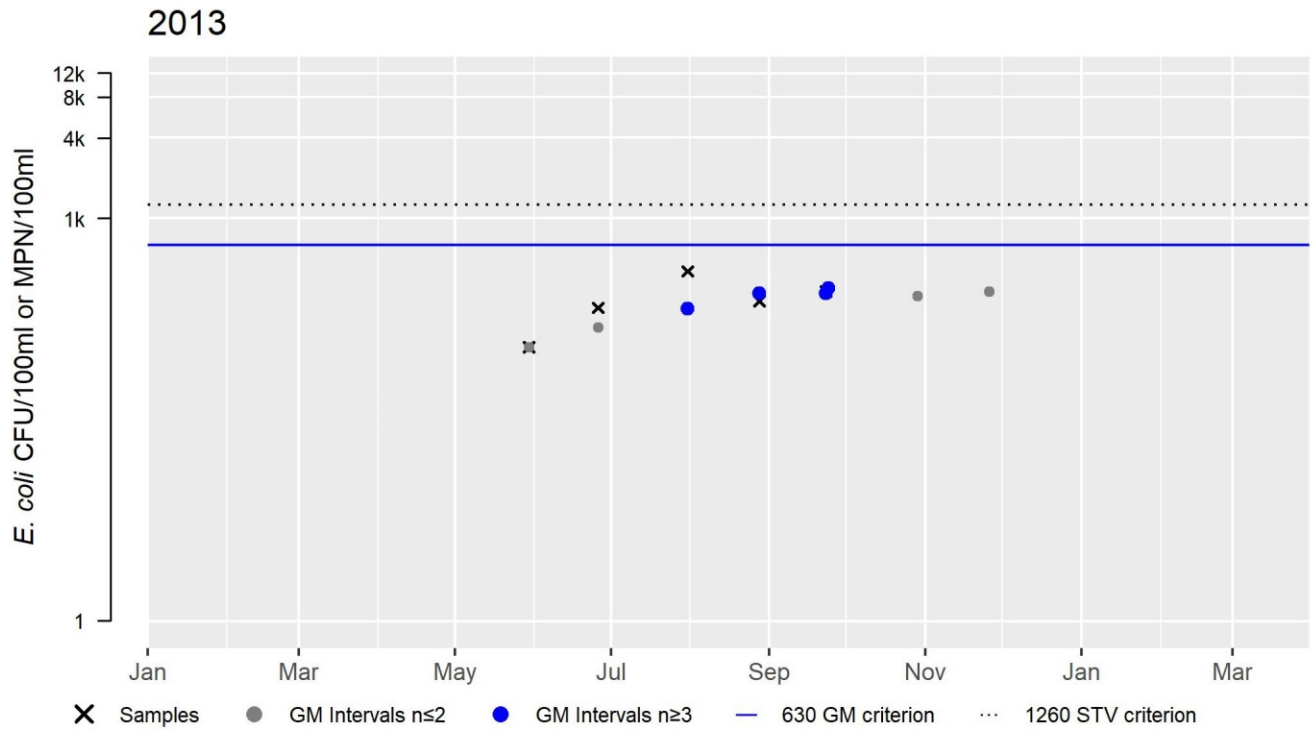
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



## W2383 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 5 |
| SeasGM | 231 |
| #GMI | 4 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

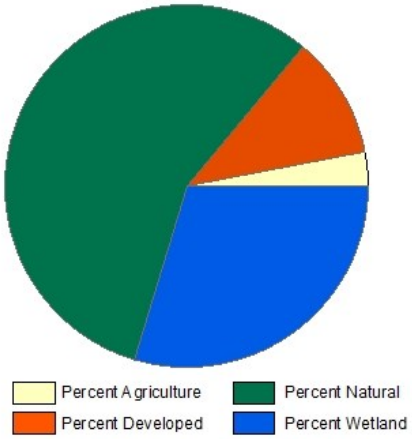


# East Branch Palmer River (MA53-08)

| | |
|---|---|
| **Location:** | Headwaters, near Stevens Corner Cemetery, Rehoboth to confluence with West Branch Palmer River (forming Palmer River), Rehoboth. |
| **AU Type:** | RIVER |
| **AU Size:** | 7.2 MILES |
| **Classification/Qualifier:** | B |

**East Branch Palmer River - MA53-08**

Watershed Area: 13.46 square miles




| Landuse Type | Entire Basin | 5km Radius Proximal Subbasin | 100m Stream Buffer | Proximal Stream Buffer |
|---|---|---|---|---|
| Land Use Area (square miles) | 13.46 | 8.45 | 2.8 | 1.68 |
| Agriculture | 3% | 2.6% | 3.3% | 3.3% |
| Developed | 10.9% | 10.1% | 9.5% | 10.5% |
| Natural | 56.5% | 55.2% | 46.3% | 45.9% |
| Wetland | 29.6% | 32% | 41% | 40.3% |
| Impervious Cover | 4.3% | | | |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 2 | 5 | Escherichia Coli (E. Coli) | | Added |
| 2 | 5 | Lead | | Added |

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

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | YES |

| **2022 Use Attainment Summary** |
|---|
| MassDEP biologists sampled the East Branch Palmer River near Williams St., Rehoboth during the summer of 2013 as part of the MAP2 monitoring project. Survey results can be briefly summarized as follows: the benthic sample (B0856) IBI score was indicative of satisfactory conditions (56) although it is noted that the high gradient Central Hills IBI was used to make the comparison, the fish sample collected in September 2013 (SampleID 5081) was 50% fluvial species (tessellated darter) and 24% of the sample was comprised of intolerant/moderately tolerant macrohabitat generalists, the water quality sampling data (W2398) (included both deployed probes & discrete sampling) were generally indicative of good water quality conditions--minimum DO 6.4mg/L, max temperature 29.1°C with 3 exceedances of the 7-DADM chronic criteria (27.7°C) and a max 24hr rolling avg of 27.1°C, pH ranged 5.7-6.5SU (n=3, once <6.0SU). There was no indication of nutrient enrichment issues: seasonal average total phosphorus concentration 0.039mg/L (n=5), max DO saturation 88.1%, max diel DO shift 1.4mg/L, and there were no observations of dense/very dense filamentous algae. The maximum specific conductance was low (96µS/cm, n=3) with a maximum chloride concentration of 18mg/L (n=5); total ammonia nitrogen concentrations were low (max 0.1mg/L, n=5) with no toxicity estimated. There were no acute or chronic metals criteria exceedances except for lead which exceeded chronic criteria (TUs 1.1, 1.6, 2.9). EPA conducted some very limited discrete water quality monitoring at three sites along the lower half of the river in Rehoboth at Winthrop St. (EPA_EB38), Moulton St. (EPA_EB40) & further west on Winthrop St. (EPA_EB39) in 2012 & 2013 (three surveys total). Data were usually indicative of good water quality (a summary incorporating data from all stations follows): max temperature 23.4°C (n=9); minimum DO 4.1mg/L (n=9) (all except two measurements >5mg/L) with max DO saturation of 88.1%, and pH 6.6-7.2SU (n=9). Specific conductance was all low (max 161µS/cm n=9). DMF biologists assigned a passage score of "10" (no possible passage) to the Village Dam (NATID# MA02467), upstream of Bay State Rd, Rehoboth. The targeted fish species are river herring and American eel. Since the population score at the Dam was noted to be "0" (no run present), an impairment decision will not be made for this AU based on diadromous fish passage at this time. The Aquatic Life Use of East Branch Palmer River (MA53-08) will be assessed as Not Supporting due to the chronic lead criteria exceedances in all three samples collected in May, June, and July 2013. The previous Alert regarding obstruction to fish passage at the Village Dam, will be carried forward. |

## *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| 5081 | MassDEP | Fish Community | East Branch Palmer River | ~1600 ft US/N of Williams St xing, adj to cedar brook school | 41.86478 | -71.22919 |
| B0856 | MassDEP | Benthic | East Branch (Palmer River)/ | [approximately 490 meters upstream/north from Williams Street, Rehoboth, MA] | 41.864782 | -71.229186 |
| W2398 | MassDEP | Water Quality | East Branch (Palmer River) | [approximately 1600 feet upstream/north from Williams Street, Rehoboth] | 41.864782 | -71.229186 |

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_EB38 | Environmental Protection Agency | Water Quality | East Branch Palmer R | East Branch Palmer River mainstem @ Rt.44, Rehoboth | 41.859784 | -71.229204 |
| EPA_EB39 | Environmental Protection Agency | Water Quality | East Branch Palmer R | East Branch Palmer River mainstem @ Rt.44, Rehoboth | 41.846528 | -71.253522 |
| EPA_EB40 | Environmental Protection Agency | Water Quality | East Branch Palmer R | East Branch Palmer River mainstem @ Rt.118 Moulton Street, Rehoboth | 41.842427 | -71.242212 |

## *Biological Monitoring Information*

### Benthic Macroinvertebrate Data

**MassDEP Benthic Macroinvertebrate Data (2011-2017).** (MassDEP Undated 4)

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

| Station Code | Collection Date | Collection Method | Index Type | Organism Count | Index Score | Index Biological Condition Class |
|---|---|---|---|---|---|---|
| B0856 | 07/11/13 | RBP kicknet | Central_Hills_300ct_SE | 289 | 56 | S |

### Fish Community Data and DELTS

**Fish Community Data (2012-2019) Provided by MassDFG.** (MassDFG 2020) (MassDEP Undated 2)

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

[Species List: AE = American Eel, RP = Redfin Pickerel, SL = Sea Lamprey, TD = Tesselated Darter, YB = Yellow Bullhead]

| Sample ID | Sample Date | Method | Sample Type | Gradient | Total Taxa | Total Ind | Cold Ind % | Fluvial Taxa | Fluvial Ind % | Intol Ind % | I/MT MG Taxa | I/MT MG Ind % | Notables | CFR | Species List |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5081 | 09/19/13 | NS | TP | | 5 | 94 | 0% | 1 | 50% | 0% | 1 | 24% | No | No | AE, RP, SL, TD, YB, |

### Habitat and Flow Data (anthropogenic alterations)

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

| Assessment Summary |
|---|
| DMF biologists note a structure causing passage limitation to diadromous fish at the downstream end of the East Branch Palmer River AU. The Village Dam (NATID# MA02467) (with no associated fishway) located just upstream of Bay State Road in Rehoboth, was given a passage score of "10" on a 0-10 scale, indicating that the dam allows no possible passage of the targeted fish species, river herring and American eel. The population score was noted to be "0" (no run present). It was further noted by DMF biologists that improvement of this structure is a low priority, due to less than 1 acre of habitat being available in this tributary. Since the population score at the Village Dam was noted to be 0, an impairment decision will not be made for East Branch Palmer River (Assessment Unit MA53-08) based on diadromous fish passage information, at this time. |

## *Physico-chemical Water Quality Information*

### DO, pH, Temperature

**MassDEP Short-term Continuous Dissolved Oxygen Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[Note: Most deploys 3-5 days in length; Day Count= total # of days over all deploys; XDADMin= 3-5 Day Average of the Daily Minima, XDADA= 3-5 Day Average of the Daily Average, CW= Coldwater, WW= Warmwater]

| Station Code | Data Year | Deploys Count | Day Count | DO Min (mg/L) | Min XDADMin (mg/L) | Min XDADA (mg/L) | Delta DO Max (mg/L) | Count CW XDADMin <6.0 | Count CW 1Day Min <5.0 | Count WW Early Life Stages XDADA <6.5 | Count WW Early Life Stages 1Day Min <5.0 | Count WW Other Life Stages XDADMin <5.0 | Count WW Other Life Stages 1Day Min <4.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W2398 | 2013 | 2 | 8 | 6.4 | 7 | 7.4 | 1.4 | 0 | 0 | 0 | 0 | 0 | 0 |

**MassDEP Discrete Dissolved Oxygen Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| W2398 | 05/08/13 | 09/04/13 | 3 | 6.5 | 7.3 | 0 | 0 | 0 |

**MassDEP Long-term Continuous Temperature Data (Summer Index 2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Start Date | End Date | Index Count | 7day Count | Max Daily Mean (°C) | Max Temp (°C) | Max 7DADM (°C) | Max 7DADA (°C) | Count CWTier1 7DADM >20 | Count CWTier1 Daily Mean >23.5 | Count CWTier2 7DADA >21 | Count CWTier2 Daily Mean >24.1 | Count WW 7DADM >27.7 | Count WW Daily Mean >28.3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W2398 | 06/01/13 | 09/03/13 | 95 | 92 | 26.8 | 29.1 | 28.3 | 26.0 | 80 | 19 | 49 | 16 | 3 | 0 |

**MassDEP Short-term Continuous Temperature Data (Summer Index 2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[Summer Index is June 1 – Sept 15; Most Deploys 3-5 Days in Length; Day Count= total # of days over all deploys; Max Daily Mean= Maximum 24-Hour Average, XDADM= 3-5 Day Average of the Daily Maxima, XDADA= 3-5 Day Average of the Daily Average, CW= Coldwater, WW= Warmwater]

| Station Code | Data Year | Deploys Count | Day Count | Max Daily Mean (°C) | Max Temp (°C) | Max XDADM (°C) | Max XDADA (°C) | Count CWTier1 XDADM >20 | Count CWTier1 Daily Mean >23.5 | Count CWTier2 XDADA >21 | Count CWTier2 Daily Mean >24.1 | Count WW XDADM >27.7 | Count WW Daily Mean >28.3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W2398 | 2013 | 2 | 8 | 21.8 | 23.8 | 23.3 | 21.6 | 1 | 0 | 1 | 0 | 0 | 0 |

**24-hour Rolling Average Calculations for MassDEP Short- and Long-term Continuous Temperature Data (Summer Index 2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Start Date | End Date | Count Days Deployed | 24hr Rolling Count | Max 24hr Avg Rolling Temp (°C) | Count CWTier1 24hr Avg Rolling >23.5 °C | Count CWTier2 24hr Avg Rolling >24.1 °C | Count WW 24hr Avg Rolling >28.3°C |
|---|---|---|---|---|---|---|---|---|
| W2398 | 06/01/13 | 09/04/13 | 96 | 4587 | 27.1 | 936 | 752 | 0 |
| W2398 | 06/06/13 | 08/13/13 | 68 | 384 | 21.8 | 0 | 0 | 0 |

**MassDEP Discrete Temperature Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)
[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| W2398 | 05/08/13 | 09/04/13 | 5 | 4 | 25.9 | 20.3 | 3 | 1 | 0 | 0 |

**MassDEP Discrete pH Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 & >8.3 | pH Count <6.0 & >8.8 |
|---|---|---|---|---|---|---|---|
| W2398 | 05/08/13 | 09/04/13 | 3 | 5.7 | 6.5 | 2 | 1 |

**EPA Freshwater Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)
[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| EPA_EB38 | 10/23/12 | 10/23/12 | 1 | 9.1 | 9.1 | 0 | 0 | 0 |
| EPA_EB38 | 07/09/13 | 09/25/13 | 2 | 4.1 | 6.1 | 1 | 1 | 0 |
| EPA_EB39 | 10/23/12 | 10/23/12 | 1 | 9.5 | 9.5 | 0 | 0 | 0 |
| EPA_EB39 | 07/09/13 | 09/25/13 | 2 | 5.4 | 7.1 | 0 | 0 | 0 |
| EPA_EB40 | 10/23/12 | 10/23/12 | 1 | 9.5 | 9.5 | 0 | 0 | 0 |
| EPA_EB40 | 07/09/13 | 09/25/13 | 2 | 4.7 | 7.1 | 1 | 1 | 0 |

**EPA Freshwater Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA_EB38 | 10/23/12 | 10/23/12 | 1 | 0 | 11.6 | 11.6 | 0 | 0 | 0 | 0 |
| EPA_EB38 | 07/09/13 | 09/25/13 | 2 | 1 | 22.2 | 17.4 | 1 | 1 | 0 | 0 |
| EPA_EB39 | 10/23/12 | 10/23/12 | 1 | 0 | 11.6 | 11.6 | 0 | 0 | 0 | 0 |
| EPA_EB39 | 07/09/13 | 09/25/13 | 2 | 1 | 23.4 | 18.0 | 1 | 1 | 0 | 0 |
| EPA_EB40 | 10/23/12 | 10/23/12 | 1 | 0 | 11.5 | 11.5 | 0 | 0 | 0 | 0 |
| EPA_EB40 | 07/09/13 | 09/25/13 | 2 | 1 | 22.1 | 17.1 | 1 | 1 | 0 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_EB38 | 10/23/12 | 10/23/12 | 1 | 7.2 | 7.2 | 0 | 0 |
| EPA_EB38 | 07/09/13 | 09/25/13 | 2 | 6.6 | 6.7 | 0 | 0 |
| EPA_EB39 | 10/23/12 | 10/23/12 | 1 | 7.2 | 7.2 | 0 | 0 |
| EPA_EB39 | 07/09/13 | 09/25/13 | 2 | 6.8 | 6.9 | 0 | 0 |
| EPA_EB40 | 10/23/12 | 10/23/12 | 1 | 7.1 | 7.1 | 0 | 0 |
| EPA_EB40 | 07/09/13 | 09/25/13 | 2 | 6.6 | 6.8 | 0 | 0 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**MassDEP Nutrient Enrichment Indicator Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | Delta DO Max (mg/L) | Delta DO Avg (mg/L) | DO Sat Max (%) | pH Max (SU) | Count Algal Obsv. | Dense/V. Dense Film/Fila. Algae |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W2398 | 2013 | 5 | 0.021 | 0.077 | 0.039 | 1.4 | 0.7 | 89.1 | 6.5 | 7 | 0 |

**EPA Freshwater Nutrient Enrichment Indicator Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)

[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | DO Sat Max (%) | pH Max (SU) |
|---|---|---|---|---|---|---|---|
| EPA_EB38 | 2012 | -- | -- | -- | -- | 83.6 | 7.2 |
| EPA_EB38 | 2013 | -- | -- | -- | -- | 73.2 | 6.7 |
| EPA_EB39 | 2012 | -- | -- | -- | -- | 88.1 | 7.2 |
| EPA_EB39 | 2013 | -- | -- | -- | -- | 82.6 | 6.9 |
| EPA_EB40 | 2012 | -- | -- | -- | -- | 87.5 | 7.1 |
| EPA_EB40 | 2013 | -- | -- | -- | -- | 87.1 | 6.8 |

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

**MassDEP Clean Metals Water Column Data (2011-2018), Acute Criteria Violations.** (MassDEP Undated 8) (MassDEP Undated 5)

[CMC= Criterion Maximum Concentration, TU= Toxic Unit]

| Station Code | Data Year | Metals Count | As CMC TU >1 | Cd CMC TU >1 | Cr III CMC TU >1 | Cu CMC TU >1 | Pb CMC TU >1 | Ni CMC TU >1 | Ag CMC TU >1 | Zn CMC TU >1 |
|---|---|---|---|---|---|---|---|---|---|---|
| W2398 | 2013 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**MassDEP Clean Metals Water Column Data (2011-2018), Chronic Criteria Violations.** (MassDEP Undated 8) (MassDEP Undated 5)

[CCC= Criterion Continuous Concentration, TU= Toxic Unit]

| Station Code | Data Year | Metals Count | As CCC TU >1 | Cd CCC TU >1 | Cr III CCC TU >1 | Cu CCC TU >1 | Pb CCC TU >1 | Ni CCC TU >1 | Se CCC TU >1 | Zn CCC TU >1 |
|---|---|---|---|---|---|---|---|---|---|---|
| W2398 | 2013 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |

**MassDEP Clean Metals Water Column Data (2011-2018), Selected TU Calculations.** (MassDEP Undated 8) (MassDEP Undated 5)

[CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

| Station Code | Sample Date | Cd CMC TU | Cd CCC TU | Cu CMC TU | Cu CCC TU | Pb CMC TU | Pb CCC TU |
|---|---|---|---|---|---|---|---|
| W2398 | 05/06/13 | 0.4 | 0.7 | 0.2 | 0.29 | 0.0 | 1.1 |
| W2398 | 06/19/13 | 0.4 | 0.6 | 0.6 | 0.70 | 0.1 | 2.9 |
| W2398 | 07/29/13 | 0.2 | 0.4 | 0.2 | 0.21 | 0.1 | 1.6 |

**MassDEP Dissolved Aluminum Water Column Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[Since only dissolved aluminum data were available, these data were compared to the default freshwater criteria for total recoverable aluminum (TRA), presented in Appendix E of MassDEP's 2022 CALM. As dissolved Al is a fraction of TRA, an exceedance count of 0 does not rule out violations of the TRA criteria. CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

| Station Code | Data Year | Dissolved Al Count | Al Min (mg/L) | Al Max (mg/L) | Al Avg (mg/L) | Al CMC TU Max | Al CCC TU Max | Al CMC TU >1 | Al CCC TU >1 |
|---|---|---|---|---|---|---|---|---|---|
| W2398 | 2013 | 3 | 0.066 | 0.21 | 0.123 | 0.5 | 0.9 | 0 | 0 |

**MassDEP Total Ammonia Nitrogen (TAN) Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[TAN= NH3 + NH4+]

| Station Code | Data Year | TAN Count | TAN Min (mg/L) | TAN Max (mg/L) | TAN Avg (mg/L) | Count TAN >Chronic | Count TAN >Acute |
|---|---|---|---|---|---|---|---|
| W2398 | 2013 | 5 | 0.020 | 0.100 | 0.042 | 0 | 0 |

**MassDEP Chloride Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Chloride Count | Chloride Min (mg/L) | Chloride Max (mg/L) | Chloride Avg (mg/L) | Count Chloride >230 | Count Chloride >860 |
|---|---|---|---|---|---|---|---|
| W2398 | 2013 | 5 | 14 | 18 | 16 | 0 | 0 |

**MassDEP Discrete Specific Conductance Data (2011-2018) Compared to Estimated Chloride Criteria.** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W2398 | 05/08/13 | 09/04/13 | 3 | 51 | 96 | 0 | 0 | 0 | 0 | 0 | 0 |

**EPA Discrete Specific Conductance Data (2012-2013, 2016-2019) Compared to Estimated Chloride Criteria.** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_EB38 | 10/23/12 | 10/23/12 | 1 | 101 | 101 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_EB38 | 07/09/13 | 09/25/13 | 2 | 124 | 139 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_EB39 | 10/23/12 | 10/23/12 | 1 | 108 | 108 | 0 | 0 | 0 | 0 | 0 | 0 |

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_EB39 | 07/09/13 | 09/25/13 | 2 | 151 | 159 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_EB40 | 10/23/12 | 10/23/12 | 1 | 104 | 104 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_EB40 | 07/09/13 | 09/25/13 | 2 | 147 | 161 | 0 | 0 | 0 | 0 | 0 | 0 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH, therefore the Fish Consumption Use for East Branch Palmer River (MA53-08), is Not Assessed. | |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | NO |
| **2022 Use Attainment Summary** | |
| MassDEP staff recorded aesthetics observations of East Branch Palmer River ~1600 ft upstream of Williams St., Rehoboth (W2398) during the summer of 2013. There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded (n=8). The Aesthetics Use for the East Branch Palmer River is assessed as Fully Supporting. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W2398 | MassDEP | Water Quality | East Branch (Palmer River) | [approximately 1600 feet upstream/north from Williams Street, Rehoboth] | 41.864782 | -71.229186 |

### *Aesthetic Observations*

**Aesthetics Summary Statements for MassDEP Stations (2011-2018)** (MassDEP Undated 5)

| Station Code | Waterbody | Data Year | Field Sheet Count | Aesthetics Summary Statement |
|---|---|---|---|---|
| W2398 | East Branch (Palmer River) | 2013 | 8 | MassDEP aesthetics observations for station W2398/MAP2-407 on East Branch Palmer River (MA53-08) can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. |

**Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018)** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Field Sheet Count | Field Sheet Count w/ Film & Filamentous Algae Observations | Dense/ Very Dense Film/ Filamentous Algae |
|---|---|---|---|---|
| W2398 | 2013 | 8 | 7 | 0 |

**MassDEP Aesthetics Observations (2011-2018)** (MassDEP Undated 8)

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W2398 | East Branch (Palmer River) | 2013 | Color | Dark Tan | 1 | 8 |
| W2398 | East Branch (Palmer River) | 2013 | Color | Light Yellow/Tan | 4 | 8 |
| W2398 | East Branch (Palmer River) | 2013 | Color | None | 1 | 8 |
| W2398 | East Branch (Palmer River) | 2013 | Color | Reddish | 2 | 8 |
| W2398 | East Branch (Palmer River) | 2013 | Objectionable Deposits | No | 8 | 8 |
| W2398 | East Branch (Palmer River) | 2013 | Odor | Fishy | 1 | 8 |
| W2398 | East Branch (Palmer River) | 2013 | Odor | None | 7 | 8 |
| W2398 | East Branch (Palmer River) | 2013 | Scum | No | 8 | 8 |
| W2398 | East Branch (Palmer River) | 2013 | Turbidity | None | 7 | 8 |
| W2398 | East Branch (Palmer River) | 2013 | Turbidity | Slightly Turbid | 1 | 8 |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria samples were collected in the East Branch Palmer River at the following sampling stations (data years) from up to downstream as follows: MassDEP 5 times per year - upstream of Williams Street (W2398) (2013) and EPA 1-2 times per year – Winthrop St. (EPA_EB38), Moulton St. (EPA_EB40) & further west on Winthrop St. (EPA_EB39) (2012, 2013). Analysis of single year limited frequency MassDEP data indicated 100% of intervals had GMs >126 cfu/100ml, and two of the samples exceeded the 410 cfu/100ml STV. The seasonal GM was 588cfu/100ml. The EPA bacteria data are too limited to assess the Primary Contact Recreational Use for this AU according to the CALM "Use Attainment Impairment Decision Schema". The Primary Contact Recreational Use for East Branch Palmer River is assessed as Not Supporting because of elevated *E. coli* bacteria which is being added as an impairment. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_EB38 | Environmental Protection Agency | Water Quality | East Branch Palmer R | East Branch Palmer River mainstem @ Rt.44, Rehoboth | 41.859784 | -71.229204 |
| EPA_EB39 | Environmental Protection Agency | Water Quality | East Branch Palmer R | East Branch Palmer River mainstem @ Rt.44, Rehoboth | 41.846528 | -71.253522 |
| EPA_EB40 | Environmental Protection Agency | Water Quality | East Branch Palmer R | East Branch Palmer River mainstem @ Rt.118 Moulton Street, Rehoboth | 41.842427 | -71.242212 |
| W2398 | MassDEP | Water Quality | East Branch (Palmer River) | [approximately 1600 feet upstream/north from Williams Street, Rehoboth] | 41.864782 | -71.229186 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3) (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_EB38 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 48 | 48 | 48 |
| EPA_EB38 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 100 | 202 | 142 |
| EPA_EB39 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 16 | 16 | 16 |
| EPA_EB39 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 39 | 92 | 60 |
| EPA_EB40 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 4 | 4 | 4 |
| EPA_EB40 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 148 | 223 | 182 |
| W2398 | MassDEP | E. coli | 05/09/13 | 09/04/13 | 5 | 41 | 24196 | 588 |

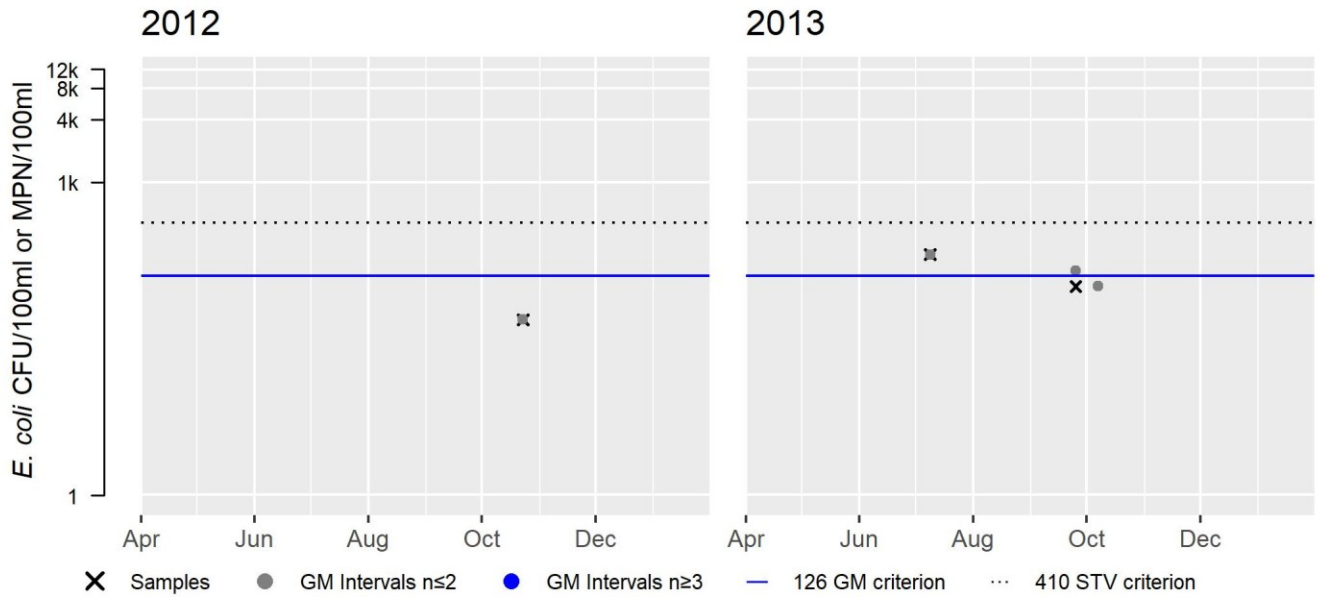
## EPA_EB38 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 48 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 142 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



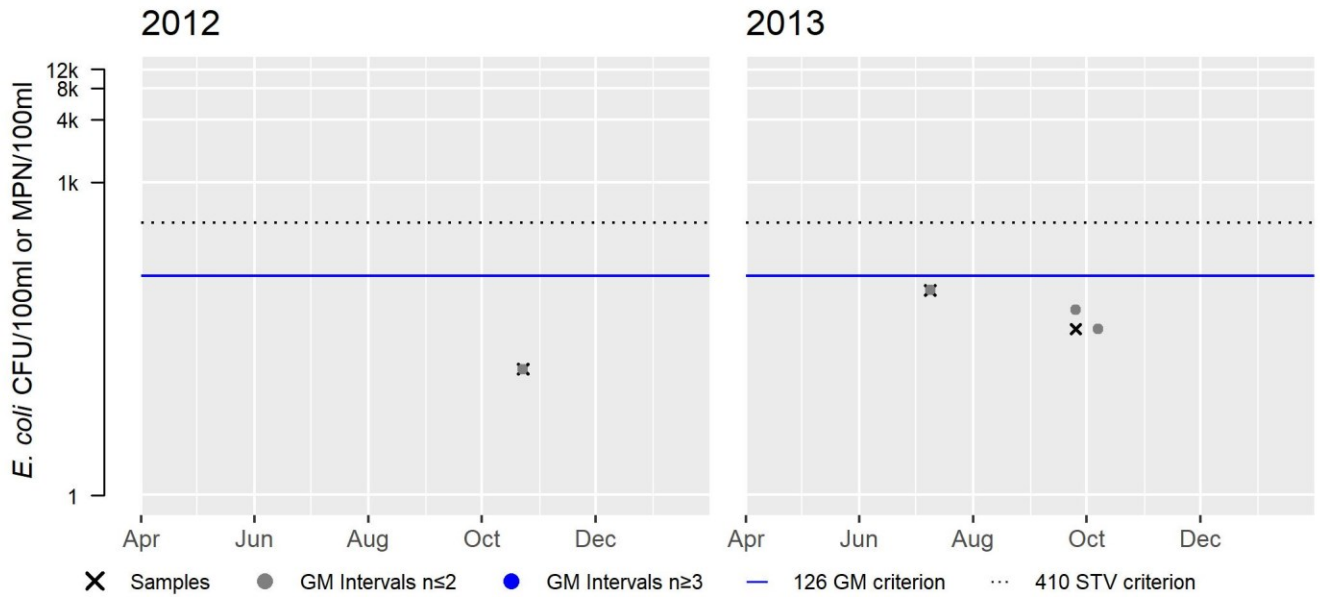
## EPA_EB39 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

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

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 60 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



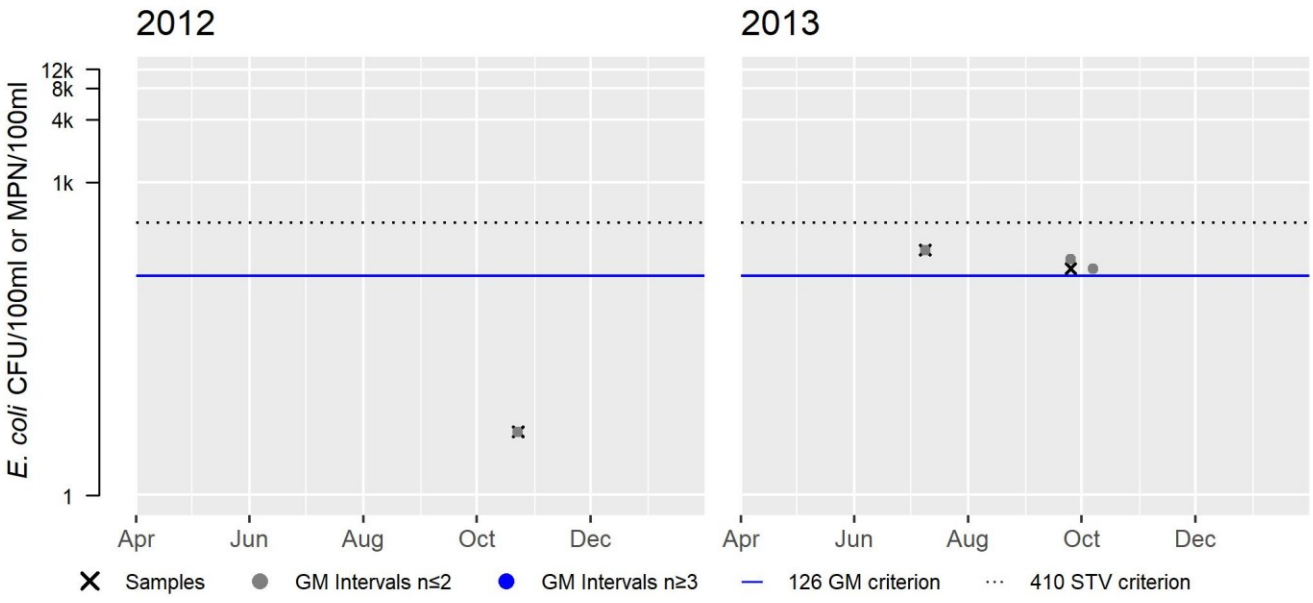
## EPA_EB40 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 4 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 182 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

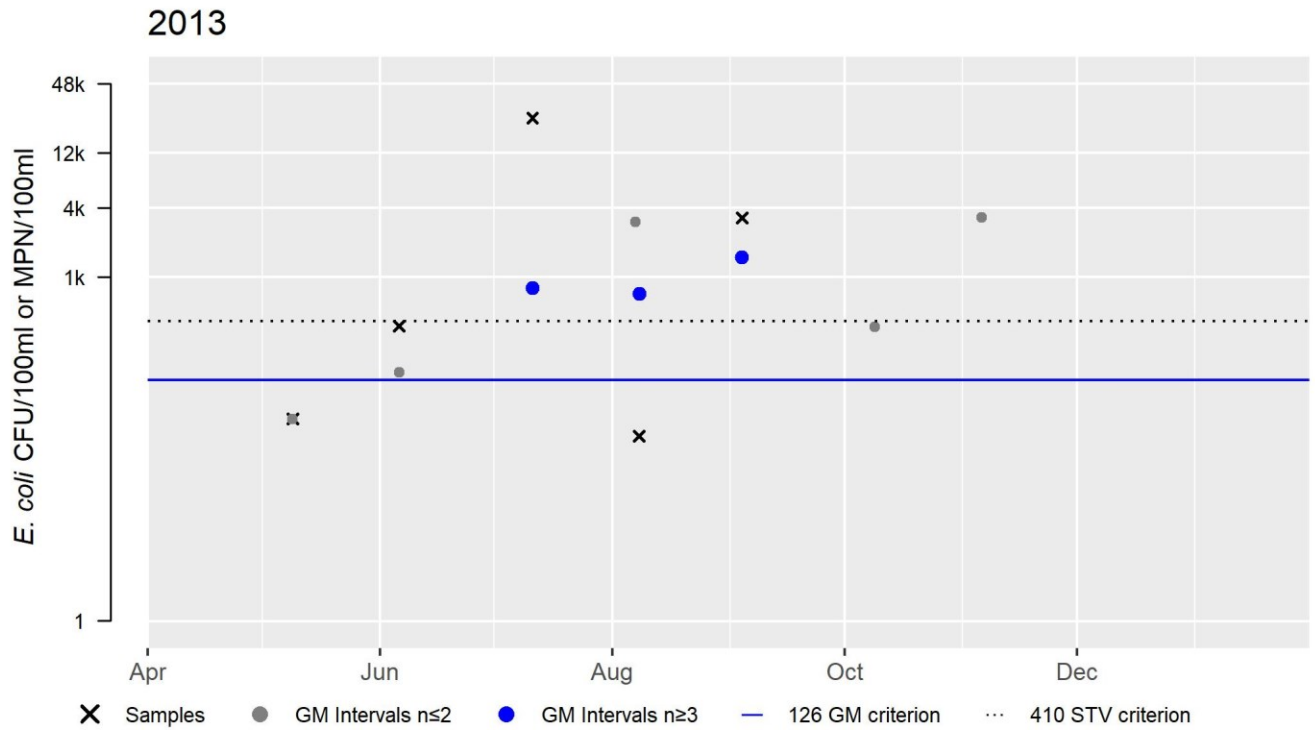
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



W2398 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 5 |
| SeasGM | 588 |
| #GMI | 3 |
| #GMI Ex | 3 |
| %GMI Ex | 100 |
| n>STV | 2 |
| %n>STV | 40 |

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




## Secondary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |

**2022 Use Attainment Summary**

*E. coli* bacteria samples were collected in the East Branch Palmer River at the following sampling stations (data years) from up to downstream as follows: MassDEP 5 times per year - upstream of Williams Street (W2398) (2013) and EPA 1-2 times per year – Winthrop St. (EPA_EB38), Moulton St. (EPA_EB40) & further west on Winthrop St. (EPA_EB39) (2012, 2013). Analysis of single year limited frequency MassDEP data indicated 100% of intervals had GMs >630 cfu/100ml, and two of the samples exceeded the 1260 cfu/100ml STV. The seasonal GM was 588cfu/100ml. The EPA bacteria data are too limited to assess the Secondary Contact Recreational Use for this AU according to the CALM "Use Attainment Impairment Decision Schema". The Secondary Contact Recreational Use for East Branch Palmer River is assessed as Not Supporting because of elevated *E. coli* bacteria which is being added as an impairment.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_EB38 | Environmental Protection Agency | Water Quality | East Branch Palmer R | East Branch Palmer River mainstem @ Rt.44, Rehoboth | 41.859784 | -71.229204 |
| EPA_EB39 | Environmental Protection Agency | Water Quality | East Branch Palmer R | East Branch Palmer River mainstem @ Rt.44, Rehoboth | 41.846528 | -71.253522 |
| EPA_EB40 | Environmental Protection Agency | Water Quality | East Branch Palmer R | East Branch Palmer River mainstem @ Rt.118 Moulton Street, Rehoboth | 41.842427 | -71.242212 |
| W2398 | MassDEP | Water Quality | East Branch (Palmer River) | [approximately 1600 feet upstream/north from Williams Street, Rehoboth] | 41.864782 | -71.229186 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3) (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_EB38 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 48 | 48 | 48 |
| EPA_EB38 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 100 | 202 | 142 |
| EPA_EB39 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 16 | 16 | 16 |
| EPA_EB39 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 39 | 92 | 60 |
| EPA_EB40 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 4 | 4 | 4 |
| EPA_EB40 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 148 | 223 | 182 |
| W2398 | MassDEP | E. coli | 05/09/13 | 09/04/13 | 5 | 41 | 24196 | 588 |

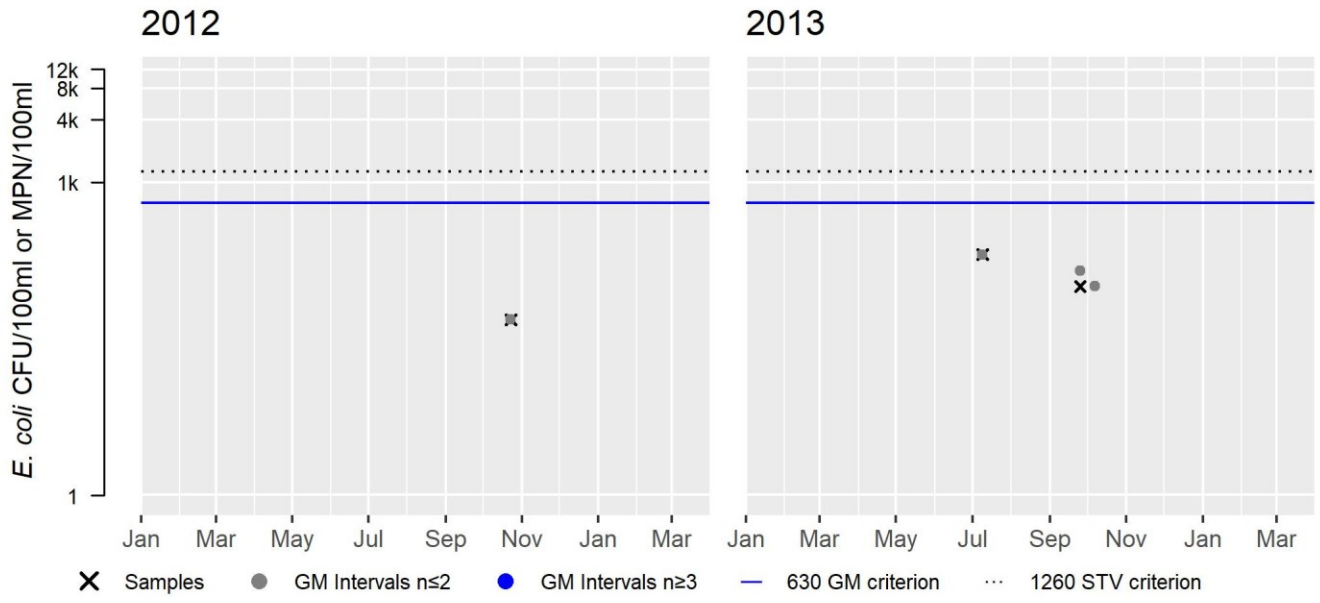
## EPA_EB38 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 48 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 142 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



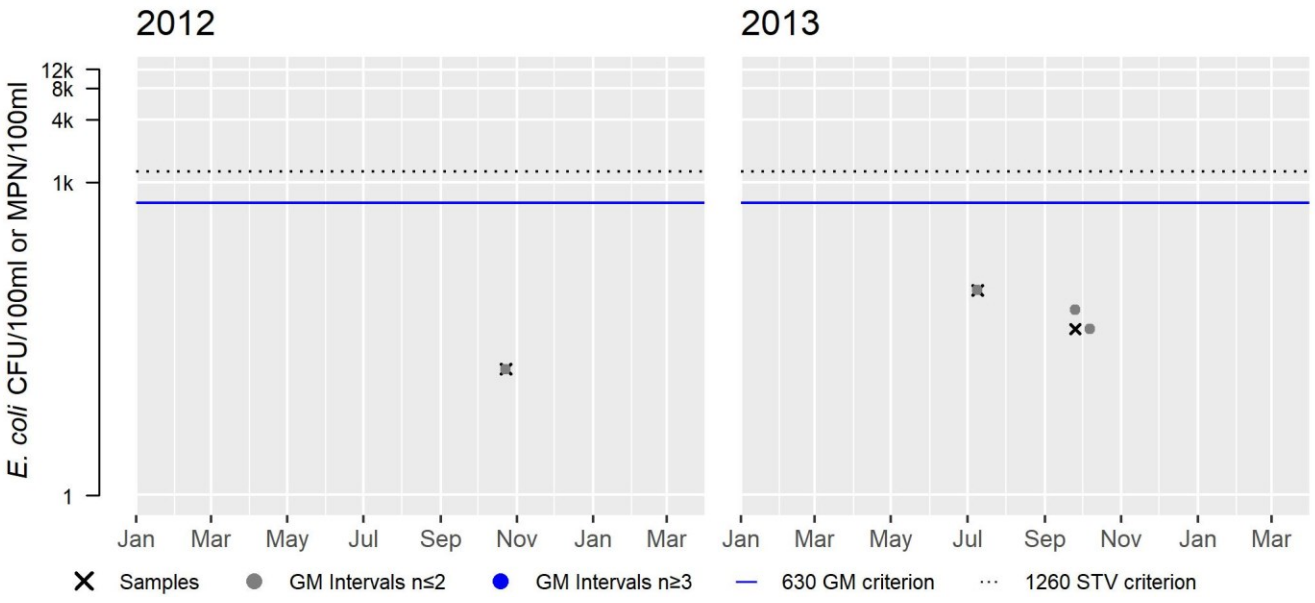
## EPA_EB39 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

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

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 60 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



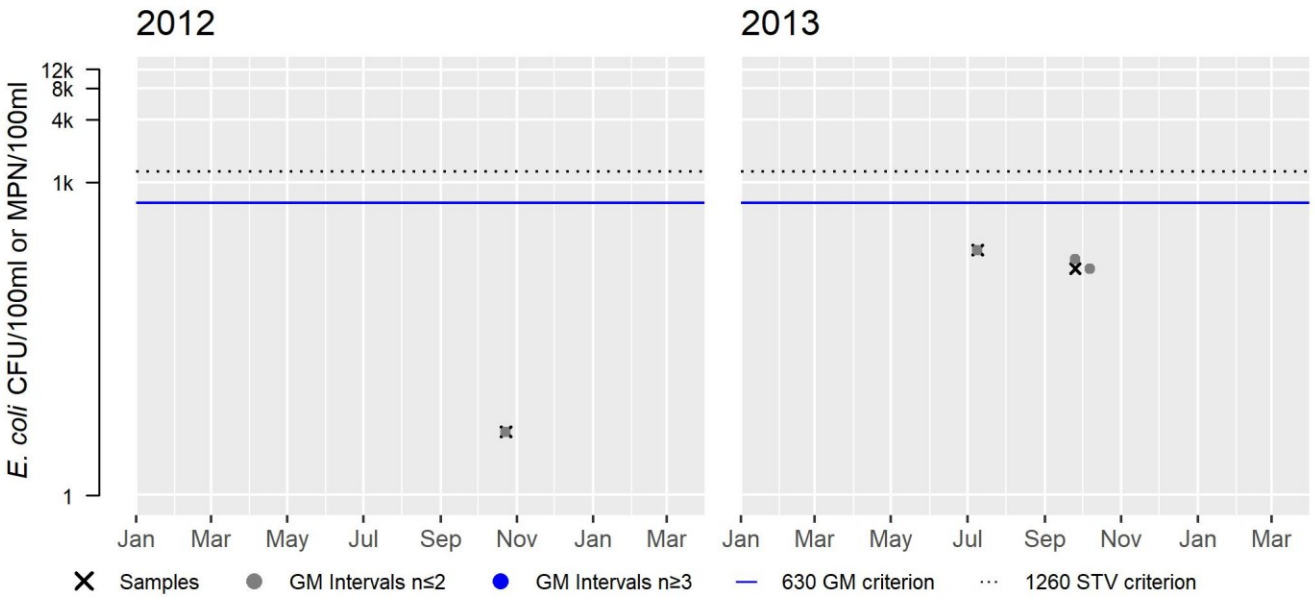
## EPA_EB40 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 4 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 182 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

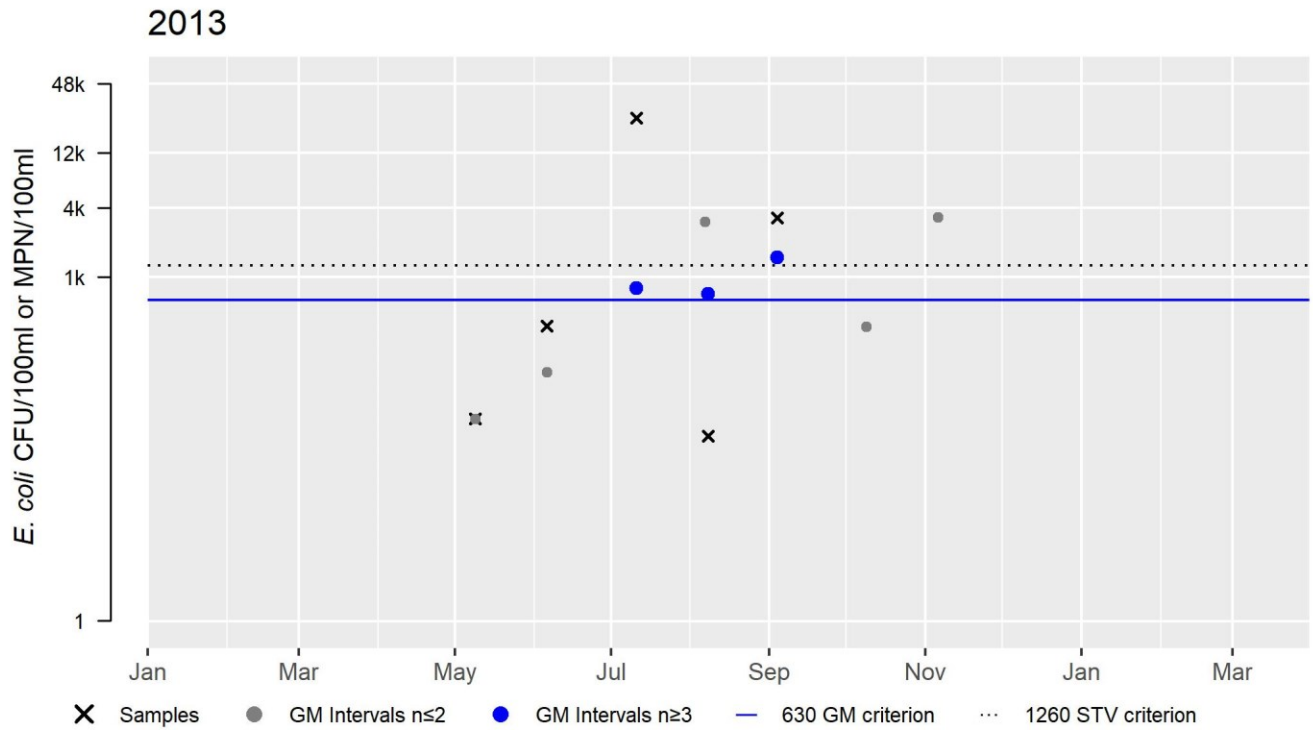
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



## W2398 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 5 |
| SeasGM | 588 |
| #GMI | 3 |
| #GMI Ex | 3 |
| %GMI Ex | 100 |
| n>STV | 2 |
| %n>STV | 40 |

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

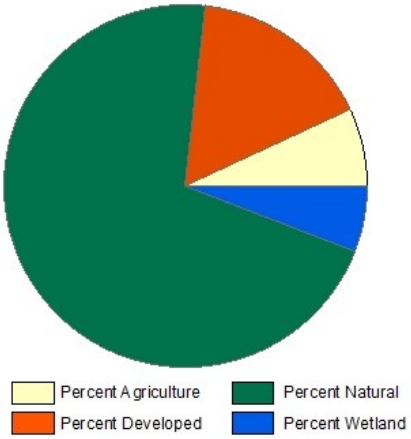


# Fullers Brook (MA53-12)

| | |
|---|---|
| **Location:** | Headwaters in wetland north of Jacobs Street, Seekonk to confluence with Palmer River, Rehoboth. |
| **AU Type:** | RIVER |
| **AU Size:** | 1.7 MILES |
| **Classification/Qualifier:** | B |

**Fullers Brook - MA53-12**

Watershed Area: 1.89 square miles




| Landuse Type | Entire Basin | 5km Radius Proximal Subbasin | 100m Stream Buffer | Proximal Stream Buffer |
|---|---|---|---|---|
| Land Use Area (square miles) | 1.89 | 1.89 | 0.5 | 0.5 |
| Agriculture | 6.9% | 6.9% | 3.8% | 3.8% |
| Developed | 16.4% | 16.4% | 10.7% | 10.7% |
| Natural | 70.8% | 70.8% | 74.9% | 74.9% |
| Wetland | 5.9% | 5.9% | 10.5% | 10.5% |
| Impervious Cover | 6.7% | | | |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 4a | 4a | Escherichia Coli (E. Coli) | 35089 | Unchanged |

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

## Recommendations

| 2022 Recommendations |
|---|
| ALU: Due to very low pH and DO measurements noted at Jacob Street in 2012 & 2013, additional water quality monitoring should be conducted in Fullers Brook to clarify if these measurements are a result of natural conditions. |

# Designated Use Attainment Decisions

## Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | YES |

**2022 Use Attainment Summary**

EPA conducted discrete water quality monitoring throughout the Fullers Brook AU in Rehoboth, at Jacob St. (EPA_FB19), Winthrop St. Rt.44 (EPA_FB17) and Trim St (EPA_FB20), during the summer of 2012 and 2013. Most of the data was indicative of good water quality conditions (a summary incorporating data from all stations follows): pH ranged from 5.4-7.3SU (n=6) (with 2 out of 6 measurements (both at EPA_FB19) falling below 6.5SU and also below 6.0SU); maximum temperature 23.3°C (n=2); minimum DO 3.0mg/L (n=6), with 2 out of 6 measurements (both at EPA_FB19) falling below 5.0mg/L; the maximum DO saturation was 89.8% (n=6) and specific conductance was all low with a max of 435µS/cm (n=6). The low pH and DO measurements at the upper end of the AU (at Jacob St.) are judged likely to be a natural condition due to the large amount of wetland (wooded swamp) in the headwaters of the watershed in proximity to Jacob St., as depicted by the MassGIS detailed wetland layer. Although the natural condition determinations (percentage land cover of natural land and wetland) are not quite met for the whole watershed, what is present is proportionally weighted towards the headwaters and thus likely to have a greater impact on the Jacob St. sample station (EPA_FB19). The Aquatic Life Use of Fullers Brook (MA53-12) will continue to be assessed as Fully Supporting based on the EPA water quality data. Alerts are being identified for low DO and pH at the most upstream sampling site (Jacob St.).

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W1956 | MassDEP | Water Quality | Fullers Brook | [Winthrop Street (Route 44), Rehoboth] | 41.835046 | -71.288982 |
| W2472 | MassDEP | Water Quality | Fullers Brook | [Blanding Road, Rehoboth] | 41.836801 | -71.293374 |

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_FB17 | Environmental Protection Agency | Water Quality | Fullers Brook | Fullers Brook @ Rt.44, Rehoboth | 41.835098 | -71.288745 |
| EPA_FB19 | Environmental Protection Agency | Water Quality | Fullers Brook | Fullers Brook @ Jacob Street, Rehoboth | 41.838243 | -71.298625 |
| EPA_FB20 | Environmental Protection Agency | Water Quality | Fullers Brook | Fullers Brook @ Trim Street, Rehoboth | 41.833301 | -71.281618 |

### *Physico-chemical Water Quality Information*

## DO, pH, Temperature

**EPA Freshwater Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| EPA_FB17 | 10/23/12 | 10/23/12 | 1 | 9.4 | 9.4 | 0 | 0 | 0 |
| EPA_FB19 | 10/23/12 | 10/23/12 | 1 | 3.0 | 3.0 | 1 | 1 | 1 |
| EPA_FB19 | 07/09/13 | 07/09/13 | 1 | 3.4 | 3.4 | 1 | 1 | 1 |
| EPA_FB20 | 10/23/12 | 10/23/12 | 1 | 10.0 | 10.0 | 0 | 0 | 0 |
| EPA_FB20 | 07/09/13 | 09/25/13 | 2 | 7.9 | 8.8 | 0 | 0 | 0 |

**EPA Freshwater Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA_FB17 | 10/23/12 | 10/23/12 | 1 | 0 | 10.2 | 10.2 | 0 | 0 | 0 | 0 |
| EPA_FB19 | 10/23/12 | 10/23/12 | 1 | 0 | 11.1 | 11.1 | 0 | 0 | 0 | 0 |
| EPA_FB19 | 07/09/13 | 07/09/13 | 1 | 1 | 23.3 | 23.3 | 1 | 1 | 0 | 0 |
| EPA_FB20 | 10/23/12 | 10/23/12 | 1 | 0 | 10.5 | 10.5 | 0 | 0 | 0 | 0 |
| EPA_FB20 | 07/09/13 | 09/25/13 | 2 | 1 | 18.3 | 14.4 | 0 | 0 | 0 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_FB17 | 10/23/12 | 10/23/12 | 1 | 6.5 | 6.5 | 0 | 0 |
| EPA_FB19 | 10/23/12 | 10/23/12 | 1 | 5.4 | 5.4 | 1 | 1 |
| EPA_FB19 | 07/09/13 | 07/09/13 | 1 | 5.4 | 5.4 | 1 | 1 |
| EPA_FB20 | 10/23/12 | 10/23/12 | 1 | 6.5 | 6.5 | 0 | 0 |
| EPA_FB20 | 07/09/13 | 09/25/13 | 2 | 6.3 | 7.3 | 1 | 0 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**MassDEP Nutrient Enrichment Indicator Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | Delta DO Max (mg/L) | Delta DO Avg (mg/L) | DO Sat Max (%) | pH Max (SU) | Count Algal Obsv. | Dense/V. Dense Film/Fila. Algae |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W1956 | 2014 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |
| W2472 | 2014 | -- | -- | -- | -- | -- | -- | -- | -- | 2 | 0 |
| W2472 | 2015 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |

**EPA Freshwater Nutrient Enrichment Indicator Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | DO Sat Max (%) | pH Max (SU) |
|---|---|---|---|---|---|---|---|
| EPA_FB17 | 2012 | -- | -- | -- | -- | 85.6 | 6.5 |
| EPA_FB19 | 2012 | -- | -- | -- | -- | 27.5 | 5.4 |
| EPA_FB19 | 2013 | -- | -- | -- | -- | 39.3 | 5.4 |
| EPA_FB20 | 2012 | -- | -- | -- | -- | 89.9 | 6.5 |
| EPA_FB20 | 2013 | -- | -- | -- | -- | 89.1 | 7.3 |

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

**EPA Discrete Specific Conductance Data (2012-2013, 2016-2019) Compared to Estimated Chloride Criteria.** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_FB17 | 10/23/12 | 10/23/12 | 1 | 231 | 231 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_FB19 | 10/23/12 | 10/23/12 | 1 | 99 | 99 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_FB19 | 07/09/13 | 07/09/13 | 1 | 69 | 69 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_FB20 | 10/23/12 | 10/23/12 | 1 | 312 | 312 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_FB20 | 07/09/13 | 09/25/13 | 2 | 367 | 435 | 0 | 0 | 0 | 0 | 0 | 0 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH, therefore the Fish Consumption Use for Fullers Brook (MA53-12), is Not Assessed. | |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | NO |
| **2022 Use Attainment Summary** | |
| MassDEP staff recorded observations related to aesthetics at two sites (data years) in Fullers Brook as follows: Blanding Road (W2472) (2014 & 2015) and Winthrop Street (Route 44) (W1956) (2014 & 2015) in Rehoboth. There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crew at either site. The Aesthetics Use for Fullers Brook will continue to be assessed as Fully Supporting. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W1956 | MassDEP | Water Quality | Fullers Brook | [Winthrop Street (Route 44), Rehoboth] | 41.835046 | -71.288982 |
| W2472 | MassDEP | Water Quality | Fullers Brook | [Blanding Road, Rehoboth] | 41.836801 | -71.293374 |

### *Aesthetic Observations*

**Aesthetics Summary Statements for MassDEP Stations (2011-2018)** (MassDEP Undated 5)

| Station Code | Waterbody | Data Year | Field Sheet Count | Aesthetics Summary Statement |
|---|---|---|---|---|
| W1956 | Fullers Brook | 2014 | 2 | MassDEP aesthetics observations for station W1956 on Fullers Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2014. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |
| W1956 | Fullers Brook | 2015 | 1 | MassDEP aesthetics observations for station W1956 on Fullers Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2015. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=1). |
| W2472 | Fullers Brook | 2014 | 2 | MassDEP aesthetics observations for station W2472 on Fullers Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2014. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |
| W2472 | Fullers Brook | 2015 | 1 | MassDEP aesthetics observations for station W2472 on Fullers Brook can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2015. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=1). |

**Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018)** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Field Sheet Count | Field Sheet Count w/ Film & Filamentous Algae Observations | Dense/ Very Dense Film/ Filamentous Algae |
|---|---|---|---|---|
| W1956 | 2014 | 2 | 1 | 0 |
| W1956 | 2015 | 1 | 0 | 0 |
| W2472 | 2014 | 2 | 2 | 0 |
| W2472 | 2015 | 1 | 1 | 0 |

**MassDEP Aesthetics Observations (2011-2018)** (MassDEP Undated 8)

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W1956 | Fullers Brook | 2014 | Color | None | 2 | 2 |
| W1956 | Fullers Brook | 2014 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W1956 | Fullers Brook | 2014 | Odor | None | 2 | 2 |
| W1956 | Fullers Brook | 2014 | Scum | Not Applicable (N/A) | 2 | 2 |
| W1956 | Fullers Brook | 2014 | Turbidity | Highly Turbid | 1 | 2 |
| W1956 | Fullers Brook | 2014 | Turbidity | Moderately Turbid | 1 | 2 |
| W1956 | Fullers Brook | 2015 | Color | Light Yellow/Tan | 1 | 1 |
| W1956 | Fullers Brook | 2015 | Objectionable Deposits | Not Applicable (N/A) | 1 | 1 |

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W1956 | Fullers Brook | 2015 | Odor | None | 1 | 1 |
| W1956 | Fullers Brook | 2015 | Scum | Not Applicable (N/A) | 1 | 1 |
| W1956 | Fullers Brook | 2015 | Turbidity | Slightly Turbid | 1 | 1 |
| W2472 | Fullers Brook | 2014 | Color | Light Yellow/Tan | 1 | 2 |
| W2472 | Fullers Brook | 2014 | Color | None | 1 | 2 |
| W2472 | Fullers Brook | 2014 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W2472 | Fullers Brook | 2014 | Odor | Musty (Basement) | 1 | 2 |
| W2472 | Fullers Brook | 2014 | Odor | None | 1 | 2 |
| W2472 | Fullers Brook | 2014 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2472 | Fullers Brook | 2014 | Turbidity | Slightly Turbid | 2 | 2 |
| W2472 | Fullers Brook | 2015 | Color | Light Yellow/Tan | 1 | 1 |
| W2472 | Fullers Brook | 2015 | Objectionable Deposits | Not Applicable (N/A) | 1 | 1 |
| W2472 | Fullers Brook | 2015 | Odor | None | 1 | 1 |
| W2472 | Fullers Brook | 2015 | Scum | Not Applicable (N/A) | 1 | 1 |
| W2472 | Fullers Brook | 2015 | Turbidity | Slightly Turbid | 1 | 1 |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria data were collected throughout Fullers Brook at the following sampling stations (data years): MassDEP 1-2 times per year - Blanding Road (W2472) (2014 & 2015) and Winthrop Street (Route 44) (W1956) (2014 & 2015) in Rehoboth and EPA 1-2 times per year – at Jacob St. (EPA_FB19), Winthrop St. Rt.44 (EPA_FB17) and Trim St (EPA_FB20) (2012 & 2013). These most recent data are too limited to assess the Primary Contact Recreational Use for Fullers Brook according to the CALM "Use Attainment Impairment Decision Schema"; consequently, the Primary Contact Recreational Use will continue to be assessed as Not Supporting with the *E. coli* impairment being carried forward. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_FB17 | Environmental Protection Agency | Water Quality | Fullers Brook | Fullers Brook @ Rt.44, Rehoboth | 41.835098 | -71.288745 |
| EPA_FB19 | Environmental Protection Agency | Water Quality | Fullers Brook | Fullers Brook @ Jacob Street, Rehoboth | 41.838243 | -71.298625 |
| EPA_FB20 | Environmental Protection Agency | Water Quality | Fullers Brook | Fullers Brook @ Trim Street, Rehoboth | 41.833301 | -71.281618 |
| W1956 | MassDEP | Water Quality | Fullers Brook | [Winthrop Street (Route 44), Rehoboth] | 41.835046 | -71.288982 |
| W2472 | MassDEP | Water Quality | Fullers Brook | [Blanding Road, Rehoboth] | 41.836801 | -71.293374 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3) (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_FB17 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 64 | 64 | 64 |
| EPA_FB17 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 606 | 1844 | 1057 |
| EPA_FB19 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 8 | 8 | 8 |
| EPA_FB19 | Environmental Protection Agency | E. coli | 07/09/13 | 07/09/13 | 1 | 20 | 20 | 20 |
| EPA_FB20 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 34 | 34 | 34 |
| EPA_FB20 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 236 | 255 | 245 |
| W1956 | MassDEP | E. coli | 06/24/14 | 07/15/14 | 2 | 687 | 727 | 707 |
| W1956 | MassDEP | E. coli | 05/14/15 | 05/14/15 | 1 | 52 | 52 | 52 |
| W2472 | MassDEP | E. coli | 06/24/14 | 07/15/14 | 2 | 548 | 921 | 710 |
| W2472 | MassDEP | E. coli | 05/14/15 | 05/14/15 | 1 | 5 | 5 | 5 |

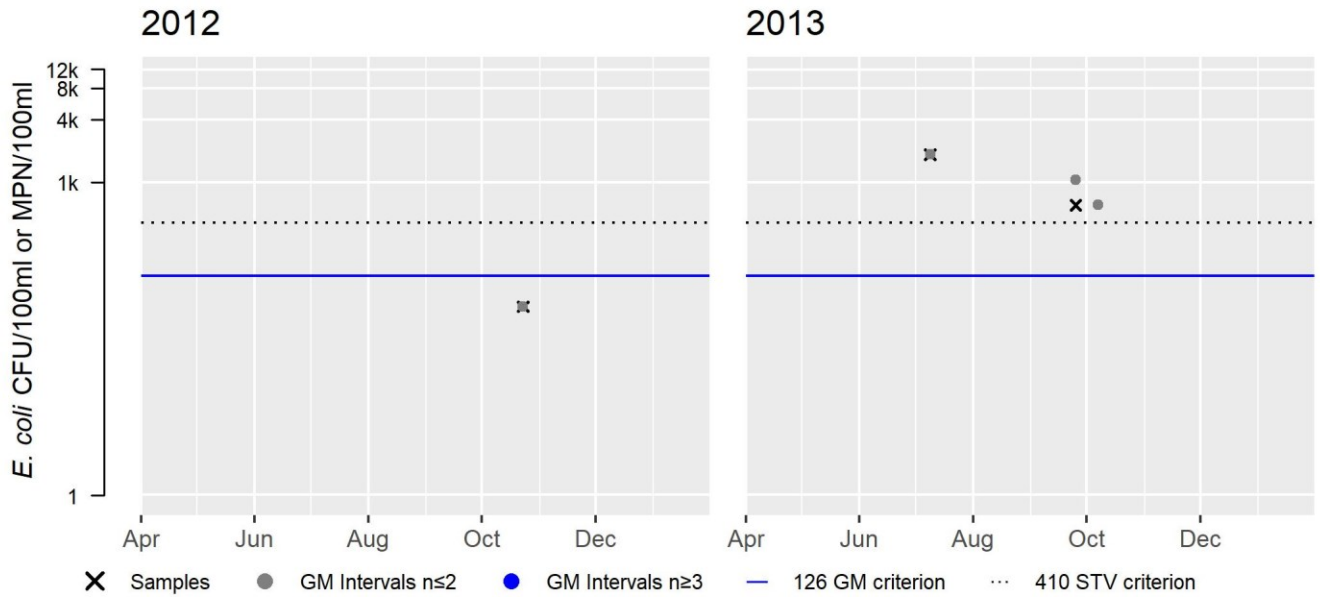
## EPA_FB17 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 64 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 1057 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 2 |
| %n>STV | 100 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



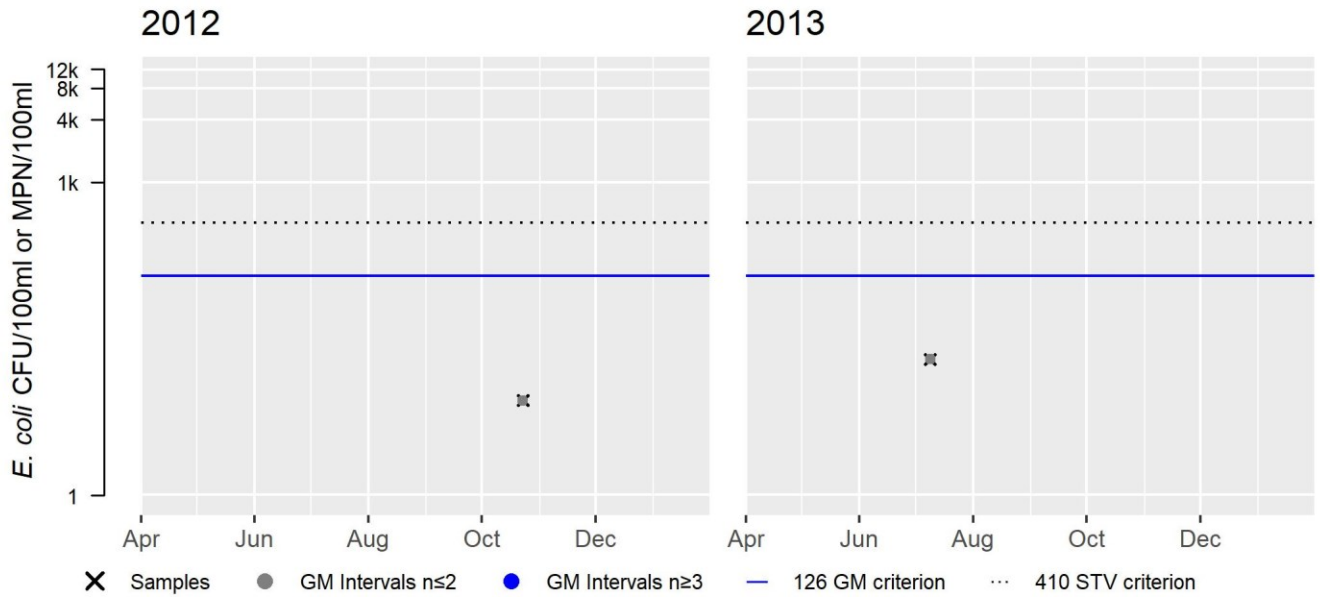
## EPA_FB19 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 8 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 20 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



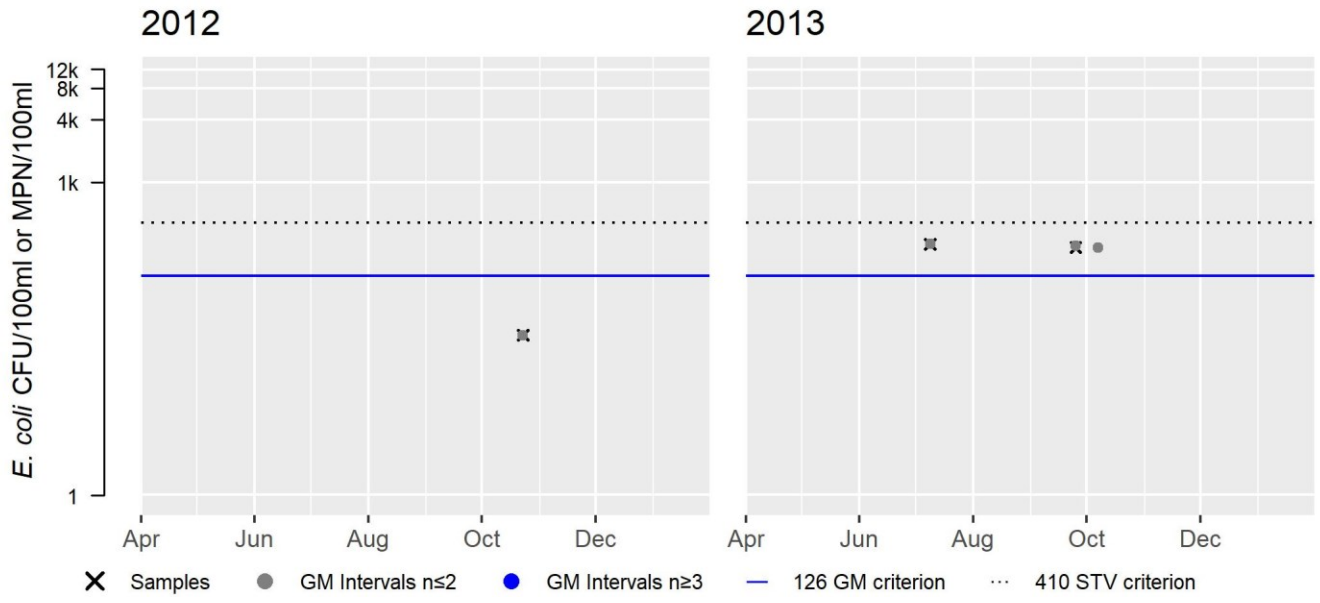
## EPA_FB20 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 34 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 245 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



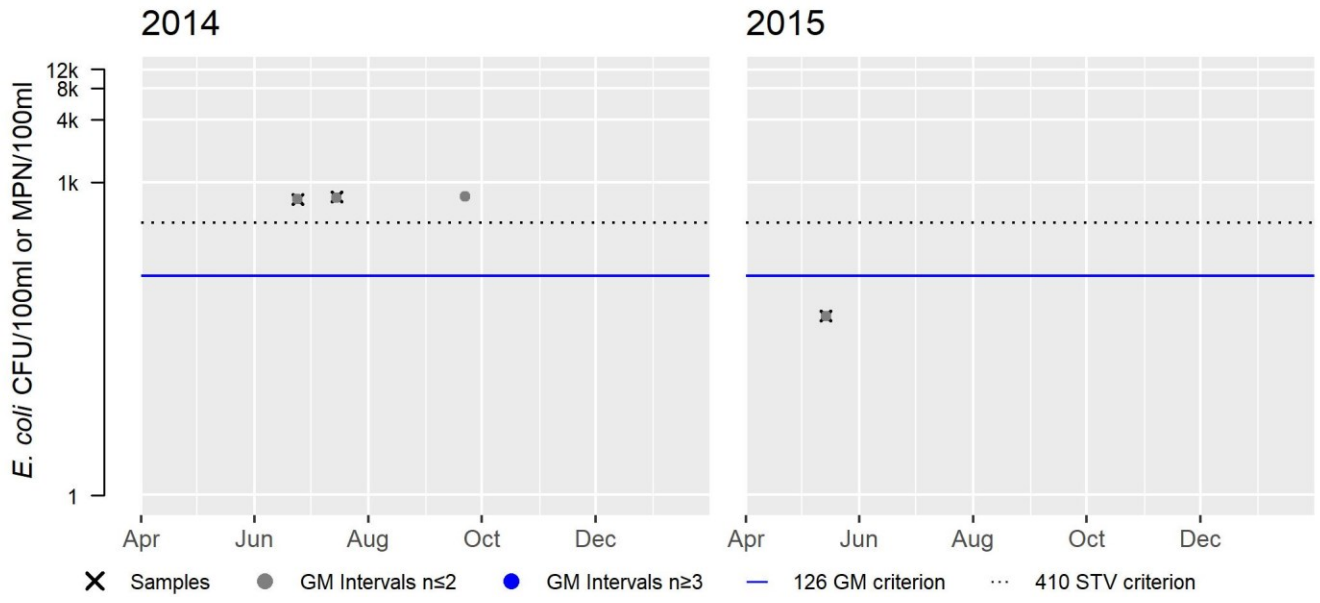
## W1956 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 707 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 2 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 52 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



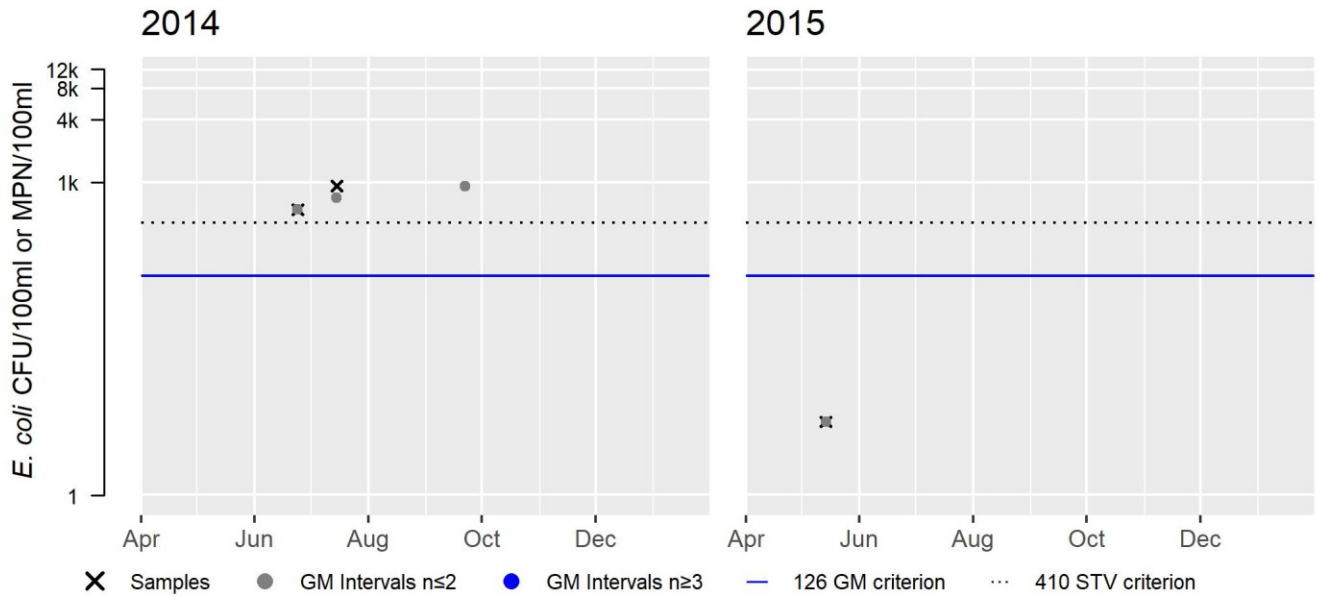
W2472 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 710 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 2 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 5 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |




**MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019** (MassDEP Undated 1)

| **Summary** |
|---|
| BST work was conducted between 2014 and 2015 at 2 sites along the Fullers Brook AU (MA53-12) and an additional unnamed tributary site; with *E. coli* counts ranging 5 to 1,300MPN. It was concluded that there is no evidence of human sources in the Fullers Brook watershed. |

## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |

*E. coli* bacteria data were collected throughout Fullers Brook at the following sampling stations (data years): MassDEP 1-2 times per year - Blanding Road (W2472) (2014 & 2015) and Winthrop Street (Route 44) (W1956) (2014 & 2015) in Rehoboth and EPA 1-2 times per year – at Jacob St. (EPA_FB19), Winthrop St. Rt.44 (EPA_FB17) and Trim St (EPA_FB20) (2012 & 2013). These most recent data are too limited to assess the Secondary Contact Recreational Use for Fullers Brook according to the CALM "Use Attainment Impairment Decision Schema"; consequently, the Secondary Contact Recreational Use will continue to be assessed as Not Supporting with the *E. coli* impairment being carried forward.

## *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_FB17 | Environmental Protection Agency | Water Quality | Fullers Brook | Fullers Brook @ Rt.44, Rehoboth | 41.835098 | -71.288745 |
| EPA_FB19 | Environmental Protection Agency | Water Quality | Fullers Brook | Fullers Brook @ Jacob Street, Rehoboth | 41.838243 | -71.298625 |
| EPA_FB20 | Environmental Protection Agency | Water Quality | Fullers Brook | Fullers Brook @ Trim Street, Rehoboth | 41.833301 | -71.281618 |
| W1956 | MassDEP | Water Quality | Fullers Brook | [Winthrop Street (Route 44), Rehoboth] | 41.835046 | -71.288982 |
| W2472 | MassDEP | Water Quality | Fullers Brook | [Blanding Road, Rehoboth] | 41.836801 | -71.293374 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3) (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_FB17 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 64 | 64 | 64 |
| EPA_FB17 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 606 | 1844 | 1057 |
| EPA_FB19 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 8 | 8 | 8 |
| EPA_FB19 | Environmental Protection Agency | E. coli | 07/09/13 | 07/09/13 | 1 | 20 | 20 | 20 |
| EPA_FB20 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 34 | 34 | 34 |
| EPA_FB20 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 236 | 255 | 245 |
| W1956 | MassDEP | E. coli | 06/24/14 | 07/15/14 | 2 | 687 | 727 | 707 |
| W1956 | MassDEP | E. coli | 05/14/15 | 05/14/15 | 1 | 52 | 52 | 52 |
| W2472 | MassDEP | E. coli | 06/24/14 | 07/15/14 | 2 | 548 | 921 | 710 |
| W2472 | MassDEP | E. coli | 05/14/15 | 05/14/15 | 1 | 5 | 5 | 5 |

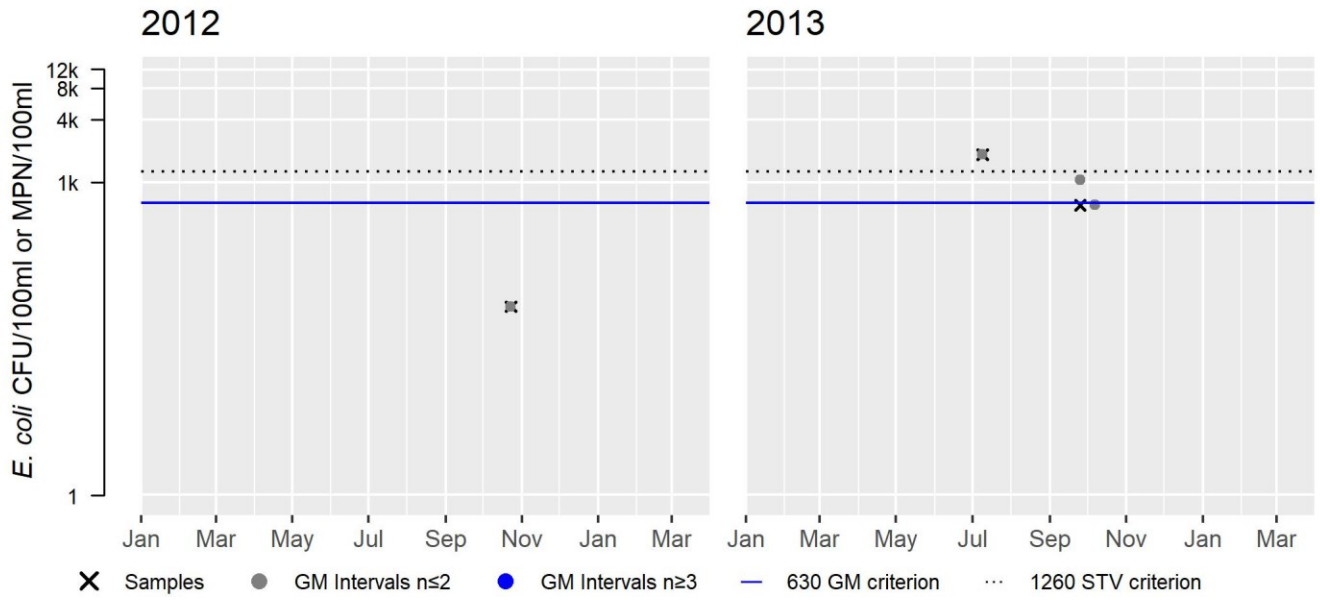
## EPA_FB17 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 64 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 1057 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



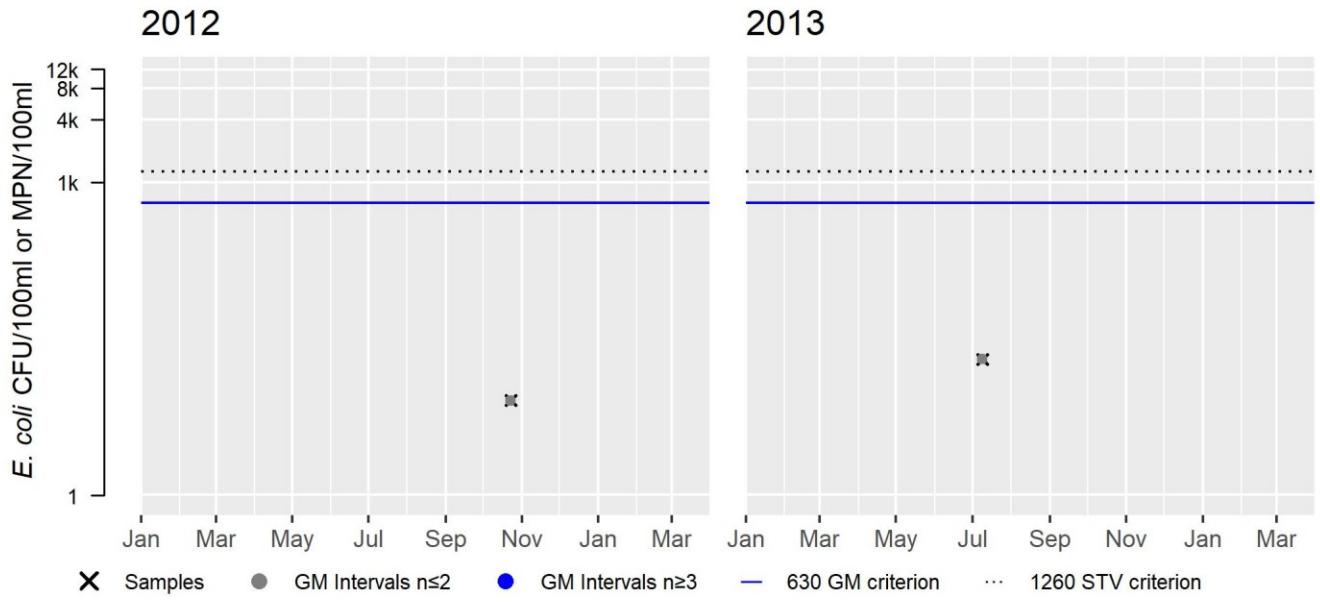
## EPA_FB19 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 8 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 20 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



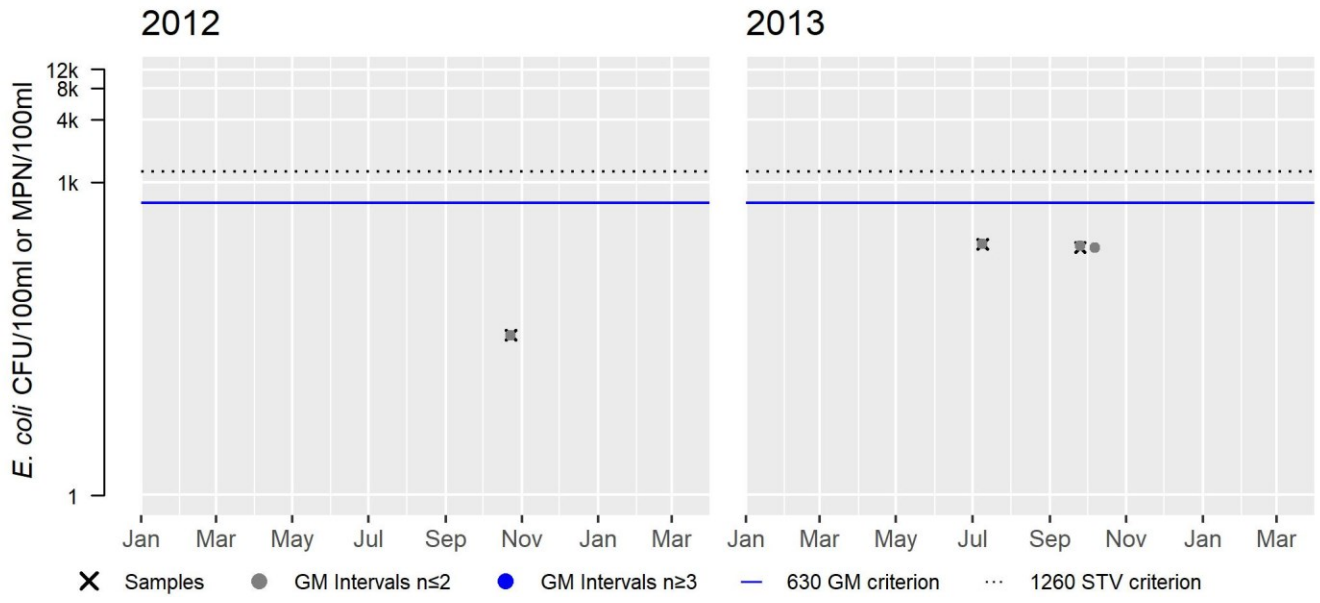
## EPA_FB20 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 34 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 245 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



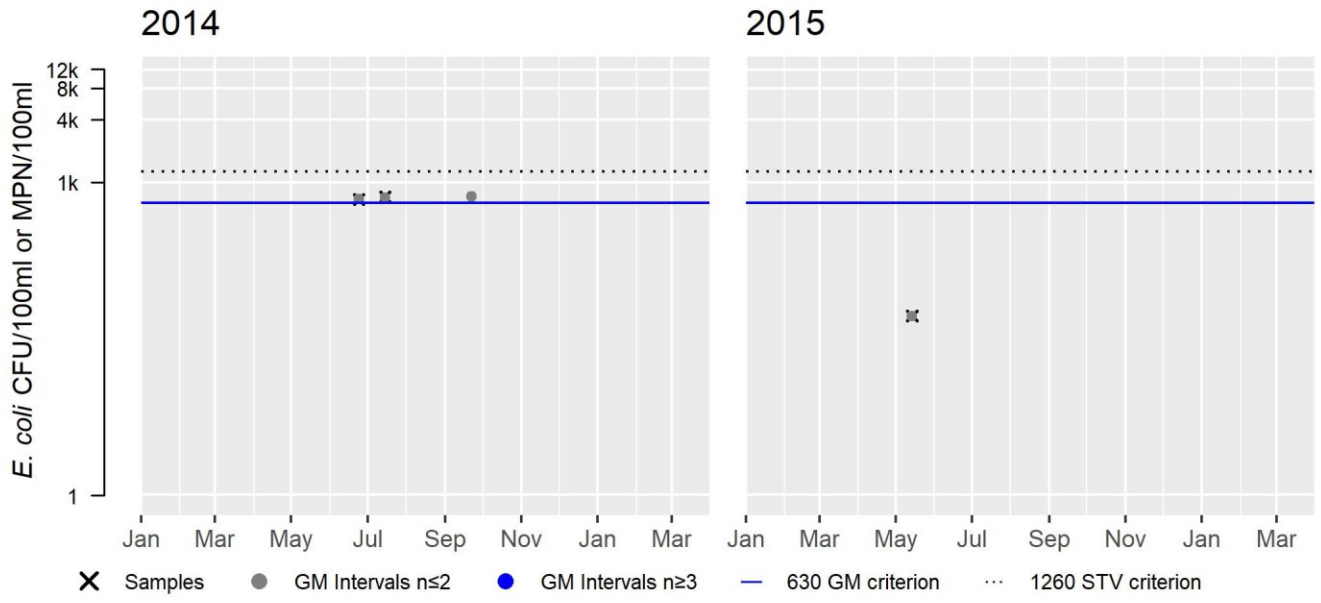
## W1956 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 707 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 52 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



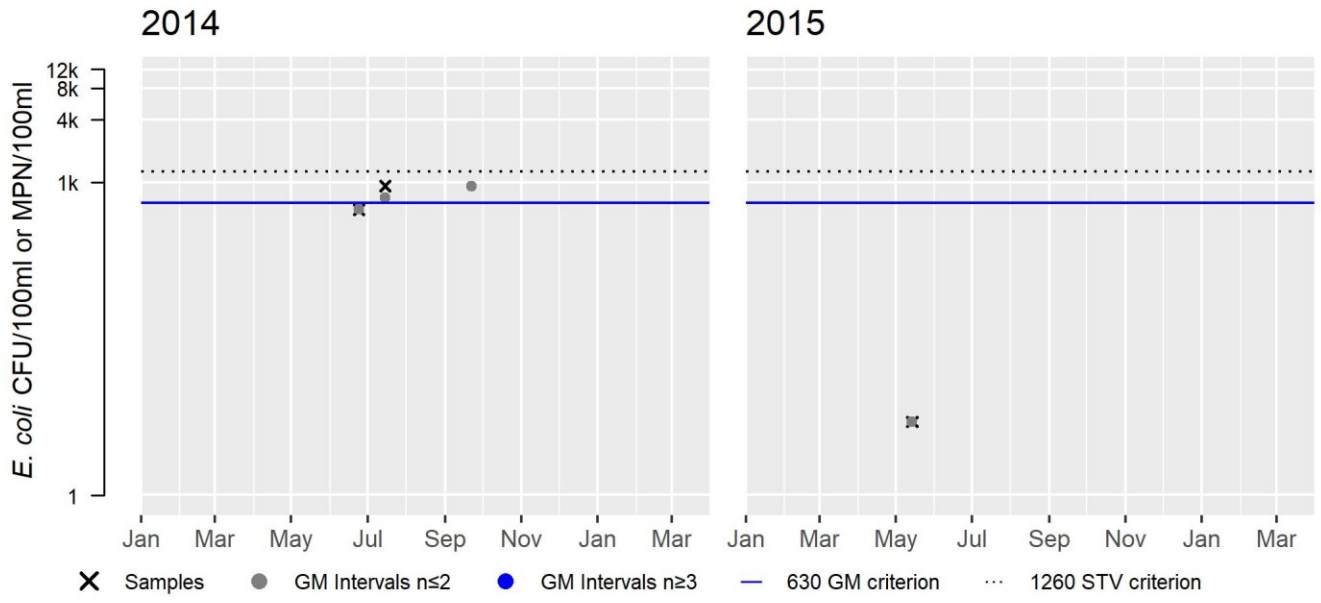
## W2472 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 710 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 5 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |

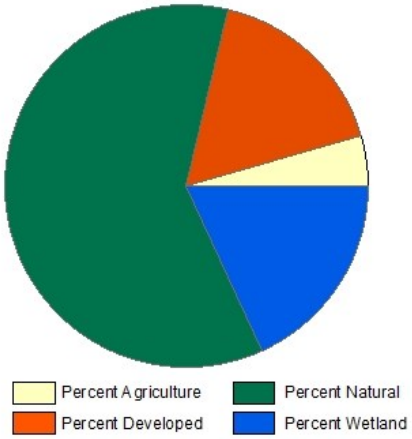


# Oak Swamp Brook (MA53-15)

| | |
|---|---|
| **Location:** | Headwaters in Oak Swamp east of School Street, Rehoboth to confluence with Rocky Run, Rehoboth. |
| **AU Type:** | RIVER |
| **AU Size:** | 3 MILES |
| **Classification/Qualifier:** | B |

**Oak Swamp Brook - MA53-15**

Watershed Area: 2.27 square miles




| Landuse Type | Entire Basin | 5km Radius Proximal Subbasin | 100m Stream Buffer | Proximal Stream Buffer |
|---|---|---|---|---|
| Land Use Area (square miles) | 2.27 | 2.27 | 0.69 | 0.69 |
| Agriculture | 4.5% | 4.5% | 1.7% | 1.7% |
| Developed | 16.8% | 16.8% | 7.6% | 7.6% |
| Natural | 60.5% | 60.4% | 52.9% | 52.8% |
| Wetland | 18.2% | 18.3% | 37.8% | 37.9% |
| Impervious Cover | 4.6% | | | |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 4a | 4a | Escherichia Coli (E. Coli) | 35091 | Unchanged |

| Impairment | Source (Confirmed Y/N) | Fish, other Aquatic Life and Wildlife | Fish Consumption | Aesthetic | Primary Contact Recreation | Secondary Contact Recreation |
|---|---|---|---|---|---|---|
| Escherichia Coli (E. Coli) | Agriculture (N) | | | | X | |
| Escherichia Coli (E. Coli) | On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (N) | | | | X | |
| Escherichia Coli (E. Coli) | Source Unknown (N) | | | | X | |
| Escherichia Coli (E. Coli) | Waterfowl (N) | | | | X | |

## Designated Use Attainment Decisions

## Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | NO |

**2022 Use Attainment Summary**

EPA conducted discrete water quality monitoring of Oak Swamp Brook in Rehoboth, at Brook St. (EPA_OS28) and Providence St. (EPA_OS27), during the summer of 2012 and 2013. Data was generally indicative of good water quality conditions (a summary incorporating data from both stations follows): pH ranged from 5.3-7.4SU (n=6) (with 3 out of 6 measurements falling below 6.5SU and twice below 6.0SU (both times at EPA_OS28); maximum temperature 21.6$^{o}$C (n=2); minimum DO 3.5mg/L (n=6), with 1 out of 6 measurements (also at EPA_OS28) falling below 5.0mg/L; the maximum DO saturation was 101.6% and specific conductance was all low with a max of 183µS/cm (n=6). The low pH and DO measurements in the middle of the AU (at Brook St.) are judged likely to be a natural condition due to the large amount of wetland (mostly wooded swamp and shrub swamp) throughout the watershed (especially in the vicinity of Brook St) as depicted by the MassGIS detailed wetland layer and the proximal stream buffer for this very small watershed (2.27 sq Miles) is >90% "natural land".
The Aquatic Life Use of Oak Swamp Brook (MA53-15) is assessed as Fully Supporting based on EPA's limited water quality data.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_OS27 | Environmental Protection Agency | Water Quality | Oak Swamp Brook | Oak Swamp Brook @ Providence Street, Rehoboth | 41.794734 | -71.252673 |
| EPA_OS28 | Environmental Protection Agency | Water Quality | Oak Swamp Brook | Oak Swamp Brook @ Brook Street, Rehoboth | 41.806704 | -71.252942 |

### *Physico-chemical Water Quality Information*

## DO, pH, Temperature

**EPA Freshwater Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)
[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| EPA_OS27 | 10/23/12 | 10/23/12 | 1 | 5.9 | 5.9 | 0 | 0 | 0 |
| EPA_OS27 | 07/09/13 | 09/25/13 | 2 | 7.7 | 8.6 | 0 | 0 | 0 |
| EPA_OS28 | 10/23/12 | 10/23/12 | 1 | 5.9 | 5.9 | 0 | 0 | 0 |
| EPA_OS28 | 07/09/13 | 09/25/13 | 2 | 3.5 | 7.0 | 1 | 1 | 1 |

**EPA Freshwater Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA_OS27 | 10/23/12 | 10/23/12 | 1 | 0 | 10.7 | 10.7 | 0 | 0 | 0 | 0 |
| EPA_OS27 | 07/09/13 | 09/25/13 | 2 | 1 | 20.3 | 15.7 | 1 | 0 | 0 | 0 |
| EPA_OS28 | 10/23/12 | 10/23/12 | 1 | 0 | 9.8 | 9.8 | 0 | 0 | 0 | 0 |
| EPA_OS28 | 07/09/13 | 09/25/13 | 2 | 1 | 21.6 | 18.0 | 1 | 0 | 0 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_OS27 | 10/23/12 | 10/23/12 | 1 | 6.6 | 6.6 | 0 | 0 |
| EPA_OS27 | 07/09/13 | 09/25/13 | 2 | 6.1 | 7.4 | 1 | 0 |
| EPA_OS28 | 10/23/12 | 10/23/12 | 1 | 5.6 | 5.6 | 1 | 1 |
| EPA_OS28 | 07/09/13 | 09/25/13 | 2 | 5.3 | 7.3 | 1 | 1 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**EPA Freshwater Nutrient Enrichment Indicator Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | DO Sat Max (%) | pH Max (SU) |
|---|---|---|---|---|---|---|---|
| EPA_OS27 | 2012 | -- | -- | -- | -- | 51.9 | 6.6 |
| EPA_OS27 | 2013 | -- | -- | -- | -- | 86.9 | 7.4 |
| EPA_OS28 | 2012 | -- | -- | -- | -- | 52.4 | 5.6 |
| EPA_OS28 | 2013 | -- | -- | -- | -- | 101.6 | 7.3 |

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

**EPA Discrete Specific Conductance Data (2012-2013, 2016-2019) Compared to Estimated Chloride Criteria.** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_OS27 | 10/23/12 | 10/23/12 | 1 | 122 | 122 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_OS27 | 07/09/13 | 09/25/13 | 2 | 156 | 183 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_OS28 | 10/23/12 | 10/23/12 | 1 | 73 | 73 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_OS28 | 07/09/13 | 09/25/13 | 2 | 6 | 92 | 0 | 0 | 0 | 0 | 0 | 0 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |

| |
|---|
| No site-specific fish consumption advisory has been issued by DPH, therefore the Fish Consumption Use for Oak Swamp Brook (MA53-15), is Not Assessed. |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No data are available to assess the status of the Aesthetic Use for Oak Swamp Brook (MA53-15), so it is Not Assessed. | |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria data were collected on Oak Swamp Brook (MA53-15) at the following sampling stations in Rehoboth (data years): EPA 1-2 times per year – at Brook St. (EPA_OS28) and Providence St. (EPA_OS27), during the summer of 2012 and 2013. These recent data are too limited to assess the Primary Contact Recreational Use for Oak Swamp Brook according to the CALM "Use Attainment Impairment Decision Schema"; consequently, the Primary Contact Recreational Use will continue to be assessed as Not Supporting with the existing *E. coli* impairment being carried forward. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_OS27 | Environmental Protection Agency | Water Quality | Oak Swamp Brook | Oak Swamp Brook @ Providence Street, Rehoboth | 41.794734 | -71.252673 |
| EPA_OS28 | Environmental Protection Agency | Water Quality | Oak Swamp Brook | Oak Swamp Brook @ Brook Street, Rehoboth | 41.806704 | -71.252942 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_OS27 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 86 | 86 | 86 |
| EPA_OS27 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 54 | 233 | 112 |
| EPA_OS28 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 344 | 344 | 344 |
| EPA_OS28 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 324 | 532 | 415 |

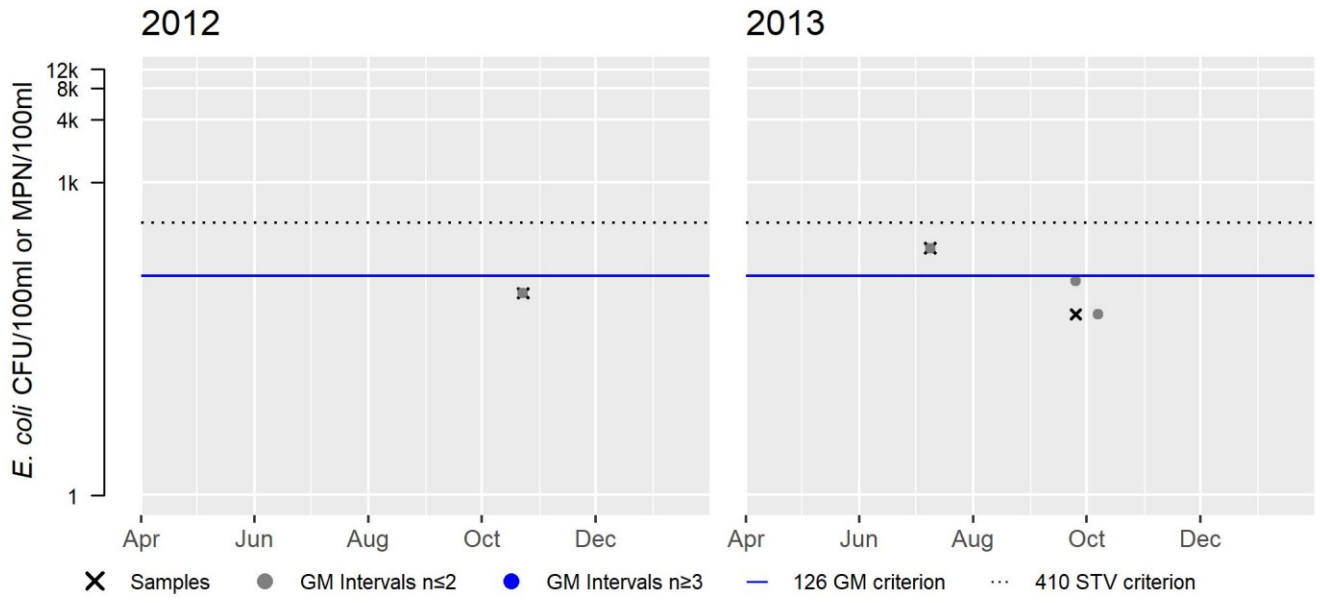
## EPA_OS27 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 86 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 112 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



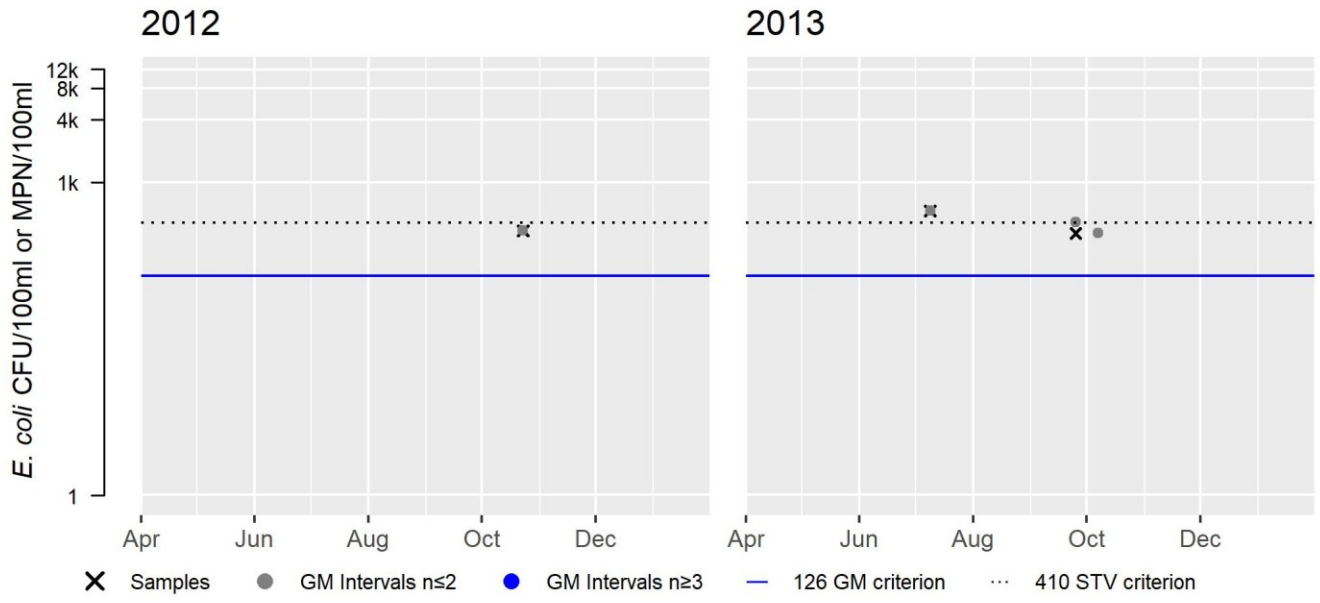
EPA_OS28 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 344 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 415 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |




## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|
| Insufficient Information | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria data were collected on Oak Swamp Brook (MA53-15) at the following sampling stations in Rehoboth (data years): EPA 1-2 times per year – at Brook St. (EPA_OS28) and Providence St. (EPA_OS27), during the summer of 2012 and 2013. These recent data are too limited to assess the Secondary Contact Recreational Use for Oak Swamp Brook according to the CALM "Use Attainment Impairment Decision Schema"; consequently, the Secondary Contact Recreational Use for Oak Swamp Brook is assessed as having Insufficient Information. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_OS27 | Environmental Protection Agency | Water Quality | Oak Swamp Brook | Oak Swamp Brook @ Providence Street, Rehoboth | 41.794734 | -71.252673 |
| EPA_OS28 | Environmental Protection Agency | Water Quality | Oak Swamp Brook | Oak Swamp Brook @ Brook Street, Rehoboth | 41.806704 | -71.252942 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_OS27 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 86 | 86 | 86 |
| EPA_OS27 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 54 | 233 | 112 |
| EPA_OS28 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 344 | 344 | 344 |
| EPA_OS28 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 324 | 532 | 415 |

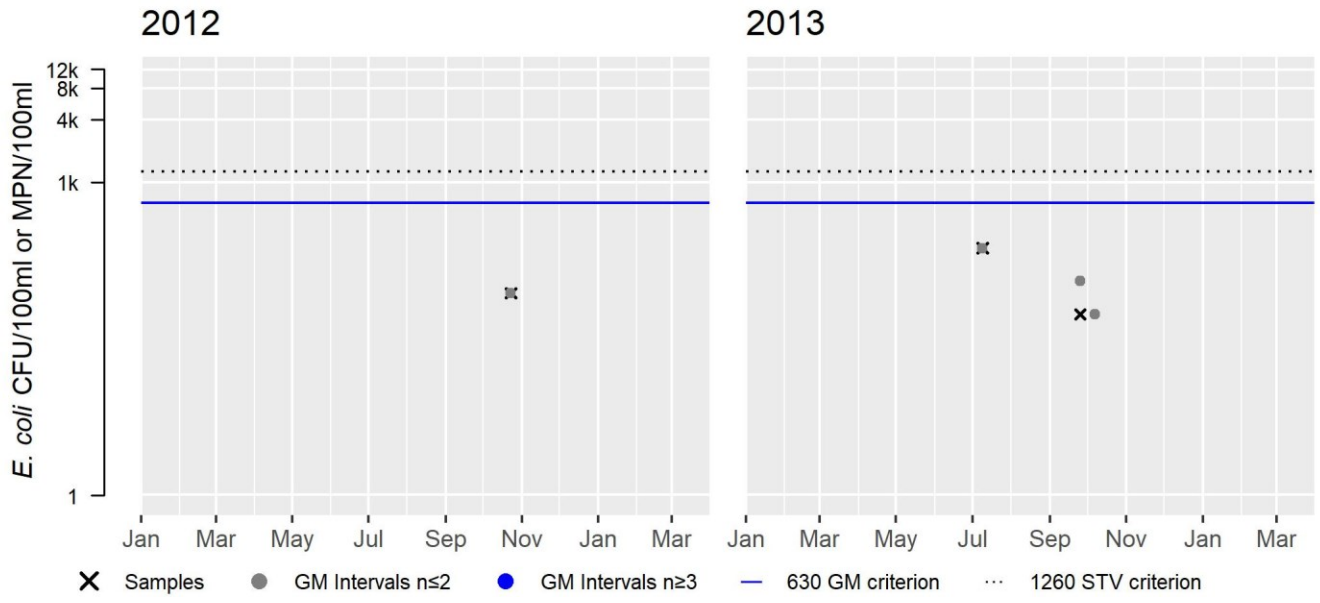
## EPA_OS27 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 86 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 112 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



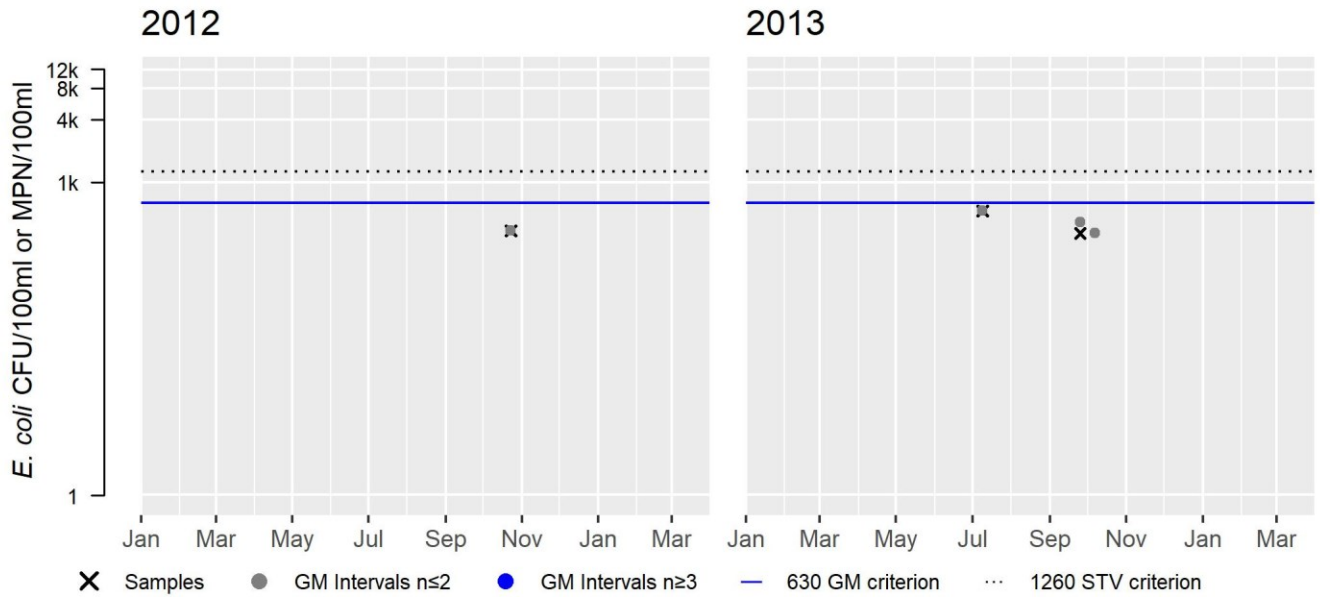
## EPA_OS28 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 344 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 415 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



# Palmer River (MA53-03)

| | |
|---|---|
| **Location:** | From Route 6 bridge, Rehoboth to state line, Swansea, MA/Barrington, RI. |
| **AU Type:** | ESTUARY |
| **AU Size:** | 0.11 SQUARE MILES |
| **Classification/Qualifier:** | SB: SFR |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 4a | 5 | Enterococcus | | Added |
| 4a | 5 | Fecal Coliform | 35085 | Unchanged |

| Impairment | Source (Confirmed Y/N) | Fish, other Aquatic Life and Wildlife | Fish Consumption | Shellfish Harvesting | Aesthetic | Primary Contact Recreation | Secondary Contact Recreation |
|---|---|---|---|---|---|---|---|
| Enterococcus | Agriculture (Y) | | | | | X | X |
| Enterococcus | Discharges from Municipal Separate Storm Sewer Systems (MS4) (N) | | | | | X | X |
| Enterococcus | On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (N) | | | | | X | X |
| Enterococcus | Waterfowl (N) | | | | | X | X |
| Enterococcus | Wildlife other than Waterfowl (N) | | | | | X | X |
| Fecal Coliform | Agriculture (Y) | | | X | | | |
| Fecal Coliform | Discharges from Municipal Separate Storm Sewer Systems (MS4) (N) | | | X | | | |
| Fecal Coliform | On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (N) | | | X | | | |
| Fecal Coliform | Waterfowl (N) | | | X | | | |
| Fecal Coliform | Wildlife other than Waterfowl (N) | | | X | | | |

## Recommendations

| 2022 Recommendations |
|---|
| ALU: Conduct additional water quality monitoring in this Palmer River AU (MA53-03) to better evaluate the Aquatic Life Use with regard to nutrient enrichment issues in this estuarine AU (i.e., document primary producer indicators such as chlorophyll a as well as additional DO data collection). |

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | YES |
| **2022 Use Attainment Summary** | |

EPA staff conducted discrete water quality monitoring along this Palmer River AU (MA53-03) at the Rt. 6 bridge, Rehoboth (EPA_PM29) & Old Providence Rd, Swansea (EPA_PM43), once or twice in 2012-2013 and typically monthly in 2016-2019. The data can be summarized as follows (incorporating data from both stations): maximum temperature 30°C (n=29 measurements during the summer index period with two measurements >29.4°C). The two high temperatures occurred at both sampling locations (EPA_PM29 and PM43) on the same day (August 15th, 2016), after a string of four days when the maximum air temperature was ≥90°C (heat wave conditions). The minimum DO was 5.4mg/L (n=3) and pH ranged from 6.1-7.5SU (n=3, just once measuring <6.5SU). The maximum total suspended solids concentration was 21mg/L (n=64) although average concentrations were low (4.6 to 9.2mg/L). Total ammonia-nitrogen concentrations were generally low (range 0.07 to 0.14mg/L, n=18), but TUs could not be calculated due to a lack of date specific pH and salinity data. The maximum total nitrogen concentration measured was 1.8mg/L but the seasonal average concentrations averaged 0.6 to 0.9mg/L (n=40 five sample average concentrations for both stations 2016 to 2019). According to CALM guidance (MassDEP 2022), total nitrogen concentrations at mid-ebb tide conditions >0.5mg/L in an estuarine area can be indicative of moderately-severely degraded habitat health for the system, however no primary producer biological screening data are available to evaluate or to clarify the existence of a nutrient enrichment problem for this Palmer River AU. The Aquatic Life Use of this Palmer River AU (MA53-03) is assessed as Fully Supporting based on EPA's water quality data but an Alert is being identified for the elevated seasonal average total nitrogen concentrations consistently documented at both the Rt.6 and Old Providence Rd. sampling locations.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_PM29 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River @ Rt. 6 bridge, downstream, Rehoboth | 41.775284 | -71.281005 |
| EPA_PM43 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River @ Old Providence Road, Swansea | 41.772176 | -71.282913 |

### *Biological Monitoring Information*

### Habitat and Flow Data (anthropogenic alterations)

**EPA Discrete Total Suspended Solids Data (2016-2019).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | TSS Count | TSS Max (mg/L) | TSS Avg (mg/L) | TSS Count >25 |
|---|---|---|---|---|---|---|
| EPA_PM29 | 04/19/16 | 11/09/16 | 8 | 15 | 9.2 | 0 |
| EPA_PM29 | 04/20/17 | 11/14/17 | 8 | 11 | 5.4 | 0 |
| EPA_PM29 | 04/24/18 | 11/05/18 | 8 | 21 | 7 | 0 |
| EPA_PM29 | 04/29/19 | 11/06/19 | 8 | 8.8 | 4.6 | 0 |
| EPA_PM43 | 04/19/16 | 11/09/16 | 8 | 12 | 8.9 | 0 |
| EPA_PM43 | 04/20/17 | 11/14/17 | 8 | 19 | 8.7 | 0 |
| EPA_PM43 | 04/24/18 | 11/05/18 | 8 | 11 | 6.7 | 0 |
| EPA_PM43 | 04/29/19 | 11/06/19 | 8 | 10 | 5.8 | 0 |

### *Physico-chemical Water Quality Information*

## DO, pH, Temperature

**EPA Estuarine Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | % Meas. <5.0 | % Meas. <4.0 |
|---|---|---|---|---|---|---|---|
| EPA_PM29 | 10/23/12 | 10/23/12 | 1 | 5.4 | 5.4 | 0 | 0 |
| EPA_PM29 | 07/09/13 | 09/25/13 | 2 | 6.0 | 6.8 | 0 | 0 |

**EPA Estuarine Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer Index is June 1 – Sept 15]

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count >29.4 |
|---|---|---|---|---|---|---|---|
| EPA_PM29 | 10/23/12 | 10/23/12 | 1 | 0 | 14.3 | 14.3 | 0 |
| EPA_PM29 | 07/09/13 | 09/25/13 | 2 | 1 | 28.0 | 22.4 | 0 |
| EPA_PM29 | 04/19/16 | 11/09/16 | 8 | 4 | 30.0 | 18.5 | 1 |
| EPA_PM29 | 04/20/17 | 11/14/17 | 8 | 4 | 25.2 | 18.0 | 0 |
| EPA_PM29 | 04/24/18 | 11/05/18 | 8 | 3 | 28.7 | 17.6 | 0 |
| EPA_PM29 | 04/29/19 | 11/06/19 | 8 | 3 | 26.5 | 17.5 | 0 |
| EPA_PM43 | 04/19/16 | 11/09/16 | 8 | 4 | 29.9 | 18.5 | 1 |
| EPA_PM43 | 04/20/17 | 11/14/17 | 8 | 4 | 25.7 | 18.5 | 0 |
| EPA_PM43 | 04/24/18 | 11/05/18 | 8 | 3 | 29.1 | 18.2 | 0 |
| EPA_PM43 | 04/29/19 | 11/06/19 | 8 | 3 | 26.7 | 17.9 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_PM29 | 10/23/12 | 10/23/12 | 1 | 6.1 | 6.1 | 1 | 0 |
| EPA_PM29 | 07/09/13 | 09/25/13 | 2 | 7.4 | 7.5 | 0 | 0 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**EPA Summer Seasonal Total Nitrogen Data (2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Total nitrogen data collected May-Sept]

| Station Code | Start Date | End Date | Seasonal TN Count | Seasonal TN Min (mg/L) | Seasonal TN Max (mg/L) | Seasonal TN Avg (mg/L) |
|---|---|---|---|---|---|---|
| EPA_PM29 | 05/17/16 | 09/13/16 | 5 | 0.4 | 0.9 | 0.7 |
| EPA_PM29 | 05/31/17 | 09/14/17 | 5 | 0.4 | 0.8 | 0.6 |
| EPA_PM29 | 05/09/18 | 09/19/18 | 5 | 0.5 | 1.8 | 0.8 |
| EPA_PM29 | 05/13/19 | 09/24/19 | 5 | 0.4 | 0.9 | 0.6 |
| EPA_PM43 | 05/17/16 | 09/13/16 | 5 | 0.4 | 0.8 | 0.7 |
| EPA_PM43 | 05/31/17 | 09/14/17 | 5 | 0.4 | 0.9 | 0.7 |
| EPA_PM43 | 05/09/18 | 09/19/18 | 5 | 0.6 | 1.6 | 0.9 |
| EPA_PM43 | 05/13/19 | 09/24/19 | 5 | 0.4 | 0.9 | 0.6 |

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

**EPA Estuarine Total Ammonia Nitrogen (TAN) Data (2017 & 2019).** (EPA 2020) (MassDEP Undated 3)

[TAN= NH3 + $NH_4^+$]

| Station Code | Start Date | End Date | TAN Count | TAN Min (mg/L) | TAN Max (mg/L) | TAN Avg (mg/L) |
|---|---|---|---|---|---|---|
| EPA_PM29 | 11/14/17 | 11/14/17 | 1 | 0.12 | 0.12 | 0.12 |
| EPA_PM29 | 04/29/19 | 11/06/19 | 8 | 0.07 | 0.09 | 0.07 |
| EPA_PM43 | 11/14/17 | 11/14/17 | 1 | 0.14 | 0.14 | 0.14 |
| EPA_PM43 | 04/29/19 | 11/06/19 | 8 | 0.07 | 0.11 | 0.08 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH; therefore this Palmer River AU (MA53-03) is Not Assessed. | |

## Shellfish Harvesting

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | YES |
| **2022 Use Attainment Summary** | |
| Palmer River (MA53-03): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1002 sq mi (92%). The sum of the approved, conditionally approved, and restricted shellfish growing areas represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.1002 sq mi (92%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of prohibited and approved, conditionally approved, and/or restricted. Alert due to prohibited area >= 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment so the Shellfish Harvesting Use is evaluated as not supporting. | |

### *Shellfish Growing Area Classifications*

**MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

| Area Name | Waterbody/Area Description | Classification | Area (Sq. Mi.) | Area (% of AU) |
|---|---|---|---|---|
| MHB5.0 | Palmer River | Prohibited | 0.10016 | 92.2% |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Insufficient Information | NO |
| **2022 Use Attainment Summary** | |
| MassDEP staff recorded aesthetics observations at one site along this Palmer River AU (MA53-03) at Rt.6 (Fall River Avenue), Rehoboth (W2444) in 2013 (n=2). There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity). Too limited data are available to assess the Aesthetics Use for this Palmer River AU (MA53-03) so it is assessed as having Insufficient Information. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W2444 | MassDEP | Water Quality | Palmer River | [Route 6 (Fall River Avenue), Rehoboth] | 41.775454 | -71.281030 |

### *Aesthetic Observations*

**Aesthetics Summary Statements for MassDEP Stations (2011-2018)** (MassDEP Undated 5)

| Station Code | Waterbody | Data Year | Field Sheet Count | Aesthetics Summary Statement |
|---|---|---|---|---|
| W2444 | Palmer River | 2013 | 2 | MassDEP aesthetics observations for station W2444 on Palmer River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |

**Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018)** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Field Sheet Count | Field Sheet Count w/ Film & Filamentous Algae Observations | Dense/ Very Dense Film/ Filamentous Algae |
|---|---|---|---|---|
| W2444 | 2013 | 2 | 0 | 0 |

**MassDEP Aesthetics Observations (2011-2018)** (MassDEP Undated 8)

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W2444 | Palmer River | 2013 | Color | Light Yellow/Tan | 1 | 2 |
| W2444 | Palmer River | 2013 | Color | None | 1 | 2 |
| W2444 | Palmer River | 2013 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W2444 | Palmer River | 2013 | Odor | None | 2 | 2 |
| W2444 | Palmer River | 2013 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2444 | Palmer River | 2013 | Turbidity | Highly Turbid | 1 | 2 |
| W2444 | Palmer River | 2013 | Turbidity | Moderately Turbid | 1 | 2 |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |

*Enterococcus* bacteria samples were collected in the upstream half of this Palmer River AU (MA53-03) at the following sampling stations (data years): MassDEP 1 time per year – Route 6 (Fall River Avenue), Rehoboth (W2444) (2013) and EPA 1-7 times per year - downstream Rt. 6 bridge, Rehoboth (EPA_PM29), and at Old Providence Road, Swansea (EPA_PM43) (2013-2019). Analysis of the *Enterococcus* data (for years where it was sufficient) at Rt.6 (EPA_PM29) and Old Providence Rd (EPA_PM43) indicated 100% of intervals had GMs >35 cfu/100ml in four years (2016-2019) and between two and six samples each year exceed the 130 cfu/100ml STV in all four of the sample years. The seasonal GMs in the last four years ranged from 80 to 572cfu/100ml. MassDEP conducted BST work in this AU in 2013 & 2015, in support of the EPA/RIDEM/MassDEP joint effort under the "National Water Quality Initiative" (NWQI). No human source of bacteria was ever identified, though agricultural land-use was noted in the AU directly upstream (MA53-05), and this potential source was investigated/addressed by the Mass Association of Conservation Districts in partnership with NRCS, under the NWQI from 2014-2018. The Primary Contact Recreational Use for this Palmer River AU (MA53-03) is assessed as Not Supporting and *Enterococcus* bacteria is being added as an impairment.

## *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_PM29 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River @ Rt. 6 bridge, downstream, Rehoboth | 41.775284 | -71.281005 |
| EPA_PM43 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River @ Old Providence Road, Swansea | 41.772176 | -71.282913 |
| W2444 | MassDEP | Water Quality | Palmer River | [Route 6 (Fall River Avenue), Rehoboth] | 41.775454 | -71.281030 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3) (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_PM29 | Environmental Protection Agency | Enterococci | 07/10/13 | 09/25/13 | 2 | 30 | 209 | 79 |
| EPA_PM29 | Environmental Protection Agency | Enterococci | 06/20/14 | 06/20/14 | 1 | 455.5 | 455.5 | 455 |
| EPA_PM29 | Environmental Protection Agency | Enterococci | 07/09/15 | 09/09/15 | 2 | 132 | 2480 | 572 |
| EPA_PM29 | Environmental Protection Agency | Enterococci | 04/19/16 | 10/12/16 | 7 | 16 | 651 | 134 |
| EPA_PM29 | Environmental Protection Agency | Enterococci | 04/20/17 | 10/12/17 | 7 | 10 | 3255 | 226 |
| EPA_PM29 | Environmental Protection Agency | Enterococci | 04/24/18 | 10/18/18 | 7 | 10 | 2755 | 150 |
| EPA_PM29 | Environmental Protection Agency | Enterococci | 04/29/19 | 10/22/19 | 7 | 31 | 1396 | 279 |
| EPA_PM43 | Environmental Protection Agency | Enterococci | 07/10/13 | 07/10/13 | 1 | 110 | 110 | 110 |
| EPA_PM43 | Environmental Protection Agency | Enterococci | 06/20/14 | 06/20/14 | 1 | 285 | 285 | 285 |
| EPA_PM43 | Environmental Protection Agency | Enterococci | 07/09/15 | 09/09/15 | 2 | 41 | 1940 | 282 |

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_PM43 | Environmental Protection Agency | Enterococci | 04/19/16 | 10/12/16 | 7 | 20 | 922 | 80 |
| EPA_PM43 | Environmental Protection Agency | Enterococci | 04/20/17 | 10/12/17 | 7 | 41 | 1476 | 163 |
| EPA_PM43 | Environmental Protection Agency | Enterococci | 04/24/18 | 10/18/18 | 7 | 10 | 2755 | 208 |
| EPA_PM43 | Environmental Protection Agency | Enterococci | 04/29/19 | 10/22/19 | 7 | 41 | 323 | 127 |
| W2444 | MassDEP | Enterococci | 07/10/13 | 07/10/13 | 1 | 209 | 209 | 209 |

## EPA_PM29 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 79 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 455 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 572 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 2 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 134 |
| #GMI | 6 |
| #GMI Ex | 6 |
| %GMI Ex | 100 |
| n>STV | 3 |
| %n>STV | 43 |

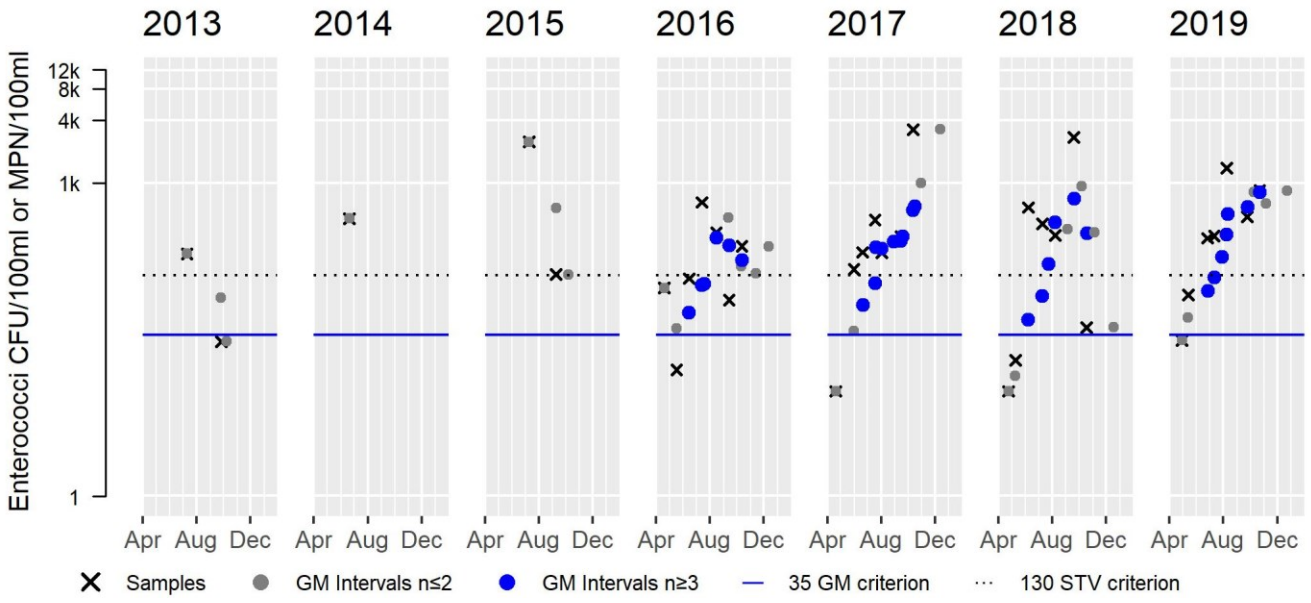
| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 226 |
| #GMI | 9 |
| #GMI Ex | 9 |
| %GMI Ex | 100 |
| n>STV | 6 |
| %n>STV | 86 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 150 |
| #GMI | 6 |
| #GMI Ex | 6 |
| %GMI Ex | 100 |
| n>STV | 4 |
| %n>STV | 57 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 279 |
| #GMI | 7 |
| #GMI Ex | 7 |
| %GMI Ex | 100 |
| n>STV | 5 |
| %n>STV | 71 |

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

| *Variable* | Cumulative %GMI Ex (all years) | Cumulative %GMI Ex (last 5 years) |
|---|---|---|
| *Result* | 100 | 100 |



## EPA_PM43 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 110 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 285 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 282 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 80 |
| #GMI | 6 |
| #GMI Ex | 6 |
| %GMI Ex | 100 |
| n>STV | 2 |
| %n>STV | 29 |

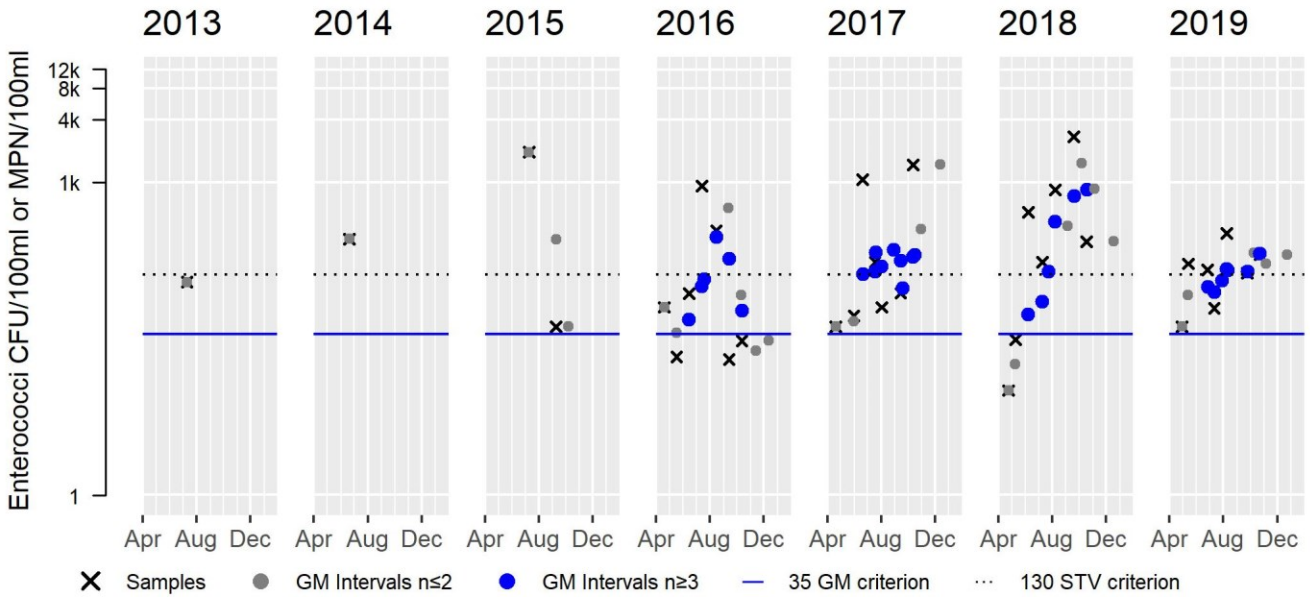
| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 163 |
| #GMI | 9 |
| #GMI Ex | 9 |
| %GMI Ex | 100 |
| n>STV | 3 |
| %n>STV | 43 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 208 |
| #GMI | 6 |
| #GMI Ex | 6 |
| %GMI Ex | 100 |
| n>STV | 5 |
| %n>STV | 71 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 127 |
| #GMI | 7 |
| #GMI Ex | 7 |
| %GMI Ex | 100 |
| n>STV | 5 |
| %n>STV | 71 |

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

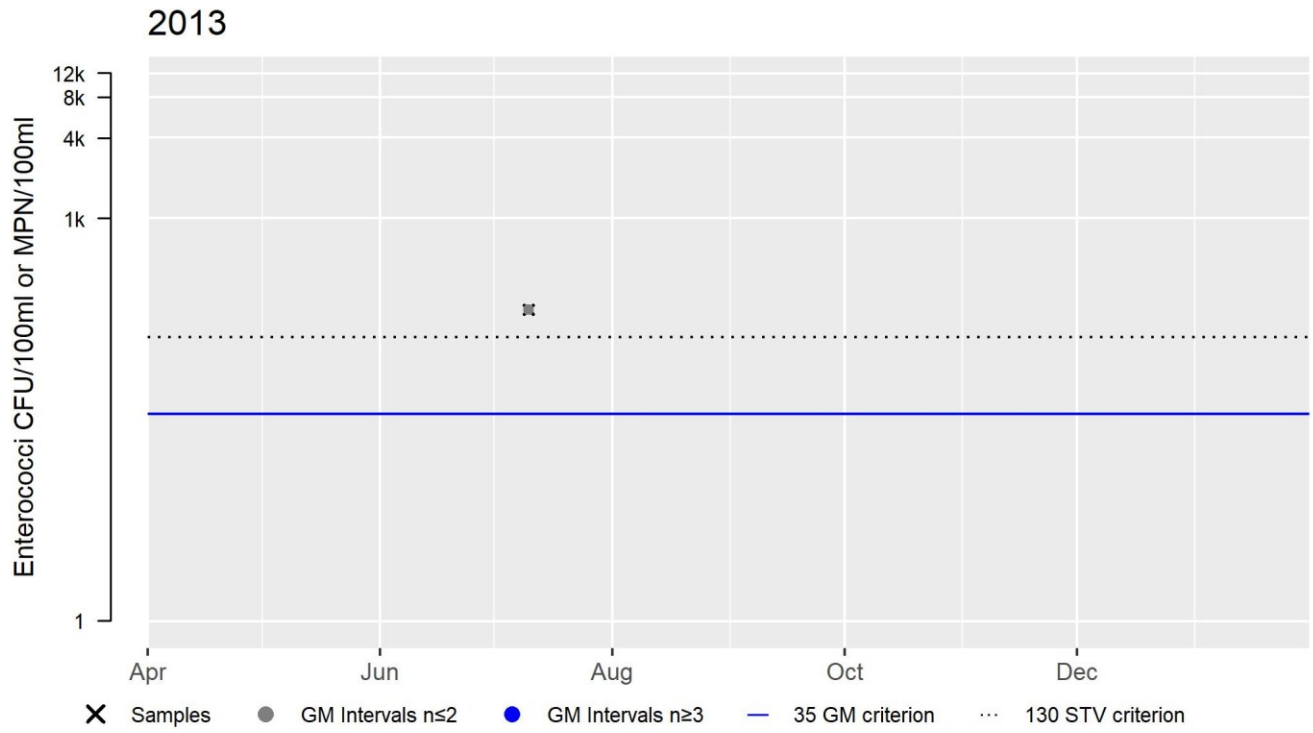
| *Variable* | Cumulative %GMI Ex (all years) | Cumulative %GMI Ex (last 5 years) |
|---|---|---|
| *Result* | 100 | 100 |



W2444 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 209 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

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




**MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019** (MassDEP Undated 1)

| **Summary** |
|---|
| BST work was conducted at 3 sites in the Palmer River AU (MA53-03) in 2013 & 2015, in support of the EPA/RIDEM/DEP joint effort in the Palmer River watershed (NWQI). *E. coli* counts ranged 20 - 1,515MPN and Enterococcus ranged 41 - 1,658MPN. No human source of bacteria was ever identified in the AU. Agricultural land-use was noted in the Palmer River watershed upstream (i.e., MA53-05) and this potential source was investigated/addressed by the Mass Association of Conservation Districts (MACD) in partnership with NRCS, under the NWQI from 2014-2018. |

### *Shellfish Growing Area Classifications*

**MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

| Summary |
|---|
| Palmer River (MA53-03): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1002 sq mi (92%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data. |

## Secondary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |
| *Enterococcus* bacteria samples were collected in the upstream half of this Palmer River AU (MA53-03) at the following sampling stations (data years): MassDEP 1 time per year – Route 6 (Fall River Avenue), Rehoboth (W2444) (2013) and EPA 1-7 times per year - downstream Rt. 6 bridge, Rehoboth (EPA_PM29), and at Old Providence Road, Swansea (EPA_PM43) (2013-2019). Analysis of the multi-year moderate frequency *Enterococcus* data (for years where it was sufficient) at Rt.6 (EPA_PM29) and Old Providence Rd (EPA_PM43) indicated 25-80% of intervals had GMs >175 cfu/100ml in four years (2016-2019) and two or more years had at least two samples that exceeded the STV of 350cfu/100ml at both sites. Both sites had cumulative interval GMs >175 cfu/100ml (64 and 42% at EPA_PM29 and EPA_PM43, respectively) while the seasonal GMs in the last four years ranged from 80 to 572cfu/100ml. MassDEP conducted BST work in this AU in 2013 & 2015, in support of the EPA/RIDEM/MassDEP joint effort under the "National Water Quality Initiative" (NWQI). No human source of bacteria was ever identified, though agricultural land-use was noted in the AU directly upstream (MA53-05) and this potential source was investigated/addressed by the Mass Association of Conservation Districts in partnership with NRCS, under the NWQI from 2014-2018. The Secondary Contact Recreational Use for this Palmer River AU (MA53-03) is assessed as Not Supporting and *Enterococcus* bacteria is being added as an impairment. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_PM29 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River @ Rt. 6 bridge, downstream, Rehoboth | 41.775284 | -71.281005 |
| EPA_PM43 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River @ Old Providence Road, Swansea | 41.772176 | -71.282913 |
| W2444 | MassDEP | Water Quality | Palmer River | [Route 6 (Fall River Avenue), Rehoboth] | 41.775454 | -71.281030 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3) (MassDEP Undated 8) (MassDEP Undated 5)
[Result units are CFU/100ml or MPN/100ml]

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_PM29 | Environmental Protection Agency | Enterococci | 07/10/13 | 09/25/13 | 2 | 30 | 209 | 79 |
| EPA_PM29 | Environmental Protection Agency | Enterococci | 06/20/14 | 06/20/14 | 1 | 455.5 | 455.5 | 455 |
| EPA_PM29 | Environmental Protection Agency | Enterococci | 07/09/15 | 09/09/15 | 2 | 132 | 2480 | 572 |
| EPA_PM29 | Environmental Protection Agency | Enterococci | 04/19/16 | 11/09/16 | 8 | 16 | 651 | 122 |
| EPA_PM29 | Environmental Protection Agency | Enterococci | 04/20/17 | 11/14/17 | 8 | 10 | 3255 | 226 |
| EPA_PM29 | Environmental Protection Agency | Enterococci | 04/24/18 | 11/05/18 | 8 | 10 | 2755 | 157 |
| EPA_PM29 | Environmental Protection Agency | Enterococci | 04/29/19 | 11/06/19 | 8 | 31 | 1396 | 317 |
| EPA_PM43 | Environmental Protection Agency | Enterococci | 07/10/13 | 07/10/13 | 1 | 110 | 110 | 110 |
| EPA_PM43 | Environmental Protection Agency | Enterococci | 06/20/14 | 06/20/14 | 1 | 285 | 285 | 285 |
| EPA_PM43 | Environmental Protection Agency | Enterococci | 07/09/15 | 09/09/15 | 2 | 41 | 1940 | 282 |
| EPA_PM43 | Environmental Protection Agency | Enterococci | 04/19/16 | 11/09/16 | 8 | 20 | 922 | 71 |
| EPA_PM43 | Environmental Protection Agency | Enterococci | 04/20/17 | 11/14/17 | 8 | 41 | 1476 | 159 |
| EPA_PM43 | Environmental Protection Agency | Enterococci | 04/24/18 | 11/05/18 | 8 | 10 | 2755 | 197 |
| EPA_PM43 | Environmental Protection Agency | Enterococci | 04/29/19 | 11/06/19 | 8 | 41 | 355 | 144 |
| W2444 | MassDEP | Enterococci | 07/10/13 | 07/10/13 | 1 | 209 | 209 | 209 |

## EPA_PM29 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 79 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 455 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 572 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 122 |
| #GMI | 8 |
| #GMI Ex | 3 |
| %GMI Ex | 38 |
| n>STV | 1 |
| %n>STV | 12 |

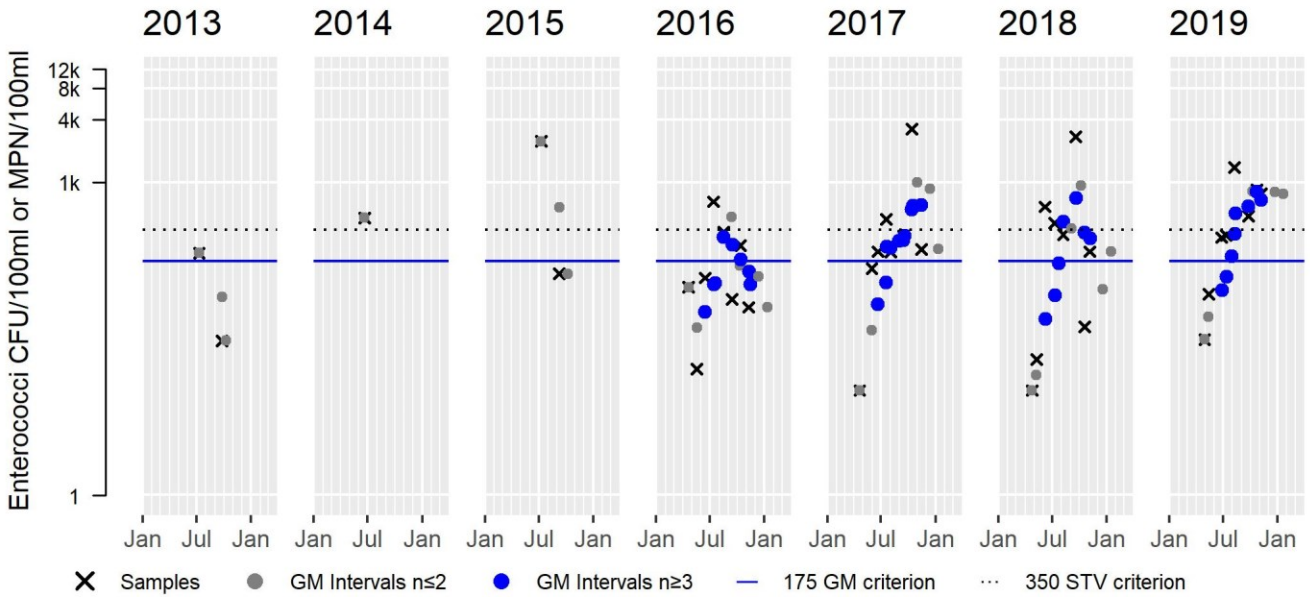
| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 226 |
| #GMI | 10 |
| #GMI Ex | 8 |
| %GMI Ex | 80 |
| n>STV | 2 |
| %n>STV | 25 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 157 |
| #GMI | 7 |
| #GMI Ex | 4 |
| %GMI Ex | 57 |
| n>STV | 3 |
| %n>STV | 38 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 317 |
| #GMI | 8 |
| #GMI Ex | 6 |
| %GMI Ex | 75 |
| n>STV | 4 |
| %n>STV | 50 |

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

| *Variable* | Cumulative %GMI Ex (all years) | Cumulative %GMI Ex (last 5 years) |
|---|---|---|
| *Result* | 64 | 64 |



## EPA_PM43 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 110 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 285 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 282 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 71 |
| #GMI | 8 |
| #GMI Ex | 2 |
| %GMI Ex | 25 |
| n>STV | 1 |
| %n>STV | 12 |

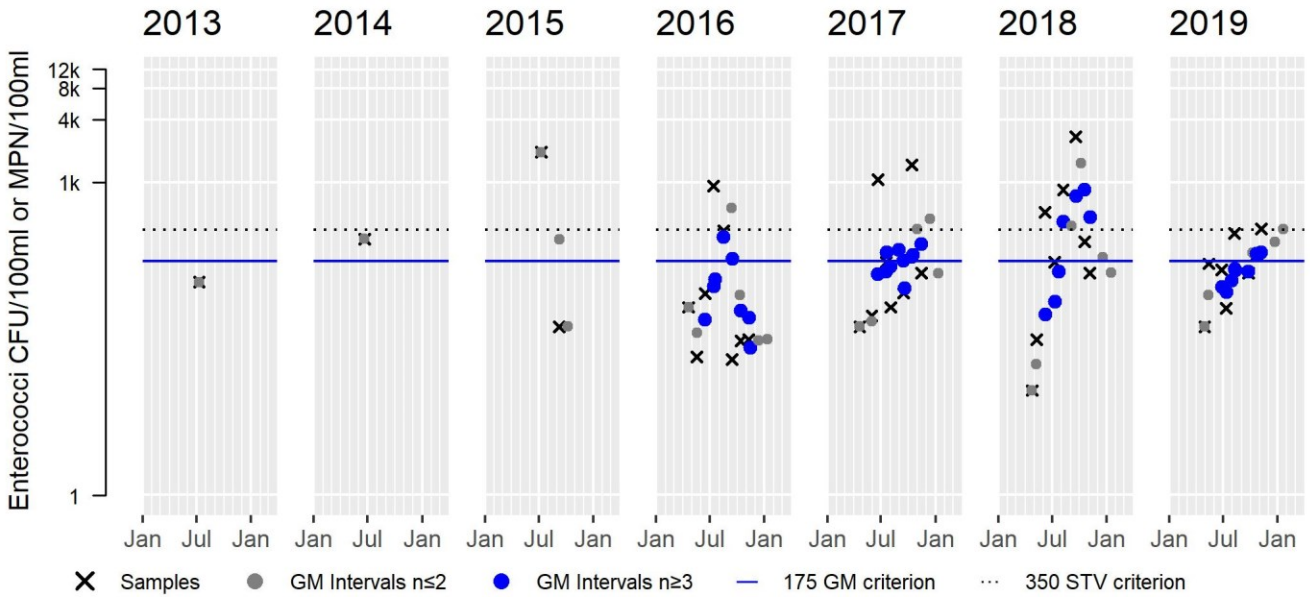
| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 159 |
| #GMI | 10 |
| #GMI Ex | 6 |
| %GMI Ex | 60 |
| n>STV | 2 |
| %n>STV | 25 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 197 |
| #GMI | 7 |
| #GMI Ex | 4 |
| %GMI Ex | 57 |
| n>STV | 3 |
| %n>STV | 38 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 144 |
| #GMI | 8 |
| #GMI Ex | 2 |
| %GMI Ex | 25 |
| n>STV | 1 |
| %n>STV | 12 |

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

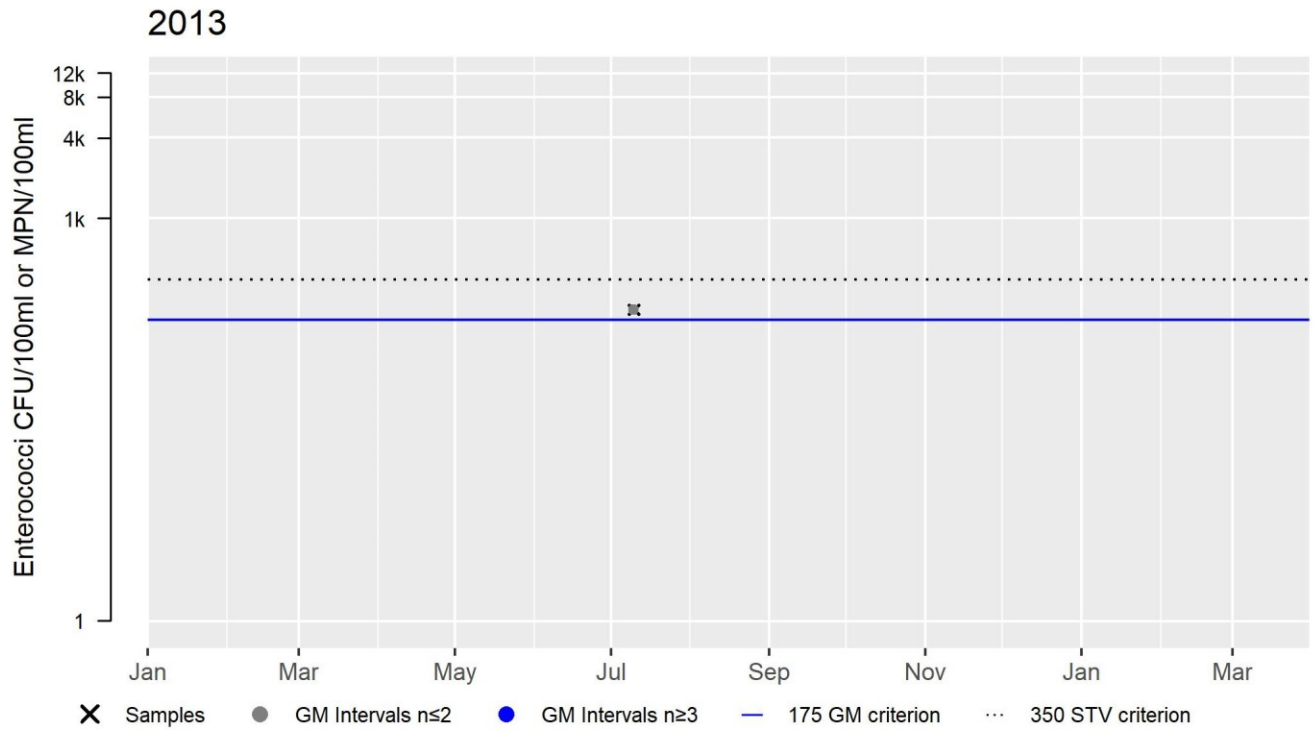
| *Variable* | Cumulative %GMI Ex (all years) | Cumulative %GMI Ex (last 5 years) |
|---|---|---|
| *Result* | 42 | 42 |



W2444 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 209 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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




## *Shellfish Growing Area Classifications*

**MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

| **Summary** |
|---|
| Palmer River (MA53-03): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.1002 sq mi (92%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data. |

# Palmer River (MA53-05)

| | |
|---|---|
| **Location:** | From the Shad Factory Pond dam (NATID: MA00787), Rehoboth to the Route 6 bridge, Rehoboth (formerly part of 2000 segment: Palmer River MA53-02). |
| **AU Type:** | ESTUARY |
| **AU Size:** | 0.09 SQUARE MILES |
| **Classification/Qualifier:** | SB: SFR |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 4a | 5 | Enterococcus | | Added |
| 4a | 5 | Fecal Coliform | 35087 | Unchanged |

| Impairment | Source (Confirmed Y/N) | Fish, other Aquatic Life and Wildlife | Fish Consumption | Shellfish Harvesting | Aesthetic | Primary Contact Recreation | Secondary Contact Recreation |
|---|---|---|---|---|---|---|---|
| Enterococcus | Agriculture (Y) | | | | | X | X |
| Enterococcus | Discharges from Municipal Separate Storm Sewer Systems (MS4) (N) | | | | | X | X |
| Enterococcus | On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (N) | | | | | X | X |
| Enterococcus | Waterfowl (N) | | | | | X | X |
| Enterococcus | Wildlife other than Waterfowl (N) | | | | | X | X |
| Fecal Coliform | Agriculture (Y) | | | X | | | |
| Fecal Coliform | Discharges from Municipal Separate Storm Sewer Systems (MS4) (N) | | | X | | | |
| Fecal Coliform | On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (N) | | | X | | | |
| Fecal Coliform | Waterfowl (N) | | | X | | | |
| Fecal Coliform | Wildlife other than Waterfowl (N) | | | X | | | |

## Recommendations

| **2022 Recommendations** |
|---|
| ALU: Conduct fish population sampling in the Palmer River downstream of Providence Street. Additional sampling for pH and primary producers (chlorophyll a) is recommended, to better evaluate a possible nutrient enrichment problem for this estuarine Palmer River AU (MA53-05). Also keep an eye on pH because this was found to be quite low at times and consider a way to assess the low flow concerns (due to water withdrawal from Shad Factory Pond), are they still an issue? How does the fish population look downstream of Providence Street? That could give us a much better idea of the Aquatic Life Use is supported. |

## Designated Use Attainment Decisions

## Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | YES |

**2022 Use Attainment Summary**

EPA conducted discrete water quality monitoring along this estuarine Palmer River AU (MA53-05) from up to downstream as follows: at the Reed St. Bridge (EPA_PM31), Providence St. (EPA_PM30), and just upstream of the confluence with Rocky Run (EPA_PM44). Sampling was conducted once or twice in 2012-2013 and typically monthly (for some parameters) in 2016-2019. The data was limited, though sometimes indicative of poor water quality (a summary incorporating data from all three stations follows): max temperature 29.4°C (n=45). A minimum DO of 5.5mg/L (n=7) and a pH range of 5.9-7.8SU (n=7), three times measuring <6.5SU and once <6.0SU. The seasonal average total nitrogen concentrations ranged 0.4-1.0mg/L (5-day averages n=60). According to CALM guidance (MassDEP 2022), total nitrogen >0.5mg/L is indicative of moderately-severely degraded health for the system. However, there are no primary producer data to clarify the existence of a nutrient enrichment problem for this AU. Total ammonia-nitrogen ranged 0.7-0.16 mg/L (n=26), but its potential toxicity could not be calculated due to a lack of date specific pH and salinity data. The Aquatic Life Use for Palmer River (MA53-05) is assessed as Fully Supporting based on the EPA water quality data. An Alert will be issued due to the elevated total nitrogen concentrations consistently observed throughout the AU and for the incidences of low pH at Providence St and Reed St. The alert for low flow (inter-basin transfer of water out of Shad Factory Pond (Segment MA53-04) to Kickemuit Reservoir in Warren, RI, where it is used by the Bristol County Water Authority) is also being carried forward.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W0633 | MassDEP | Water Quality | Palmer River | [upstream/north at Providence Street, Rehoboth] | 41.800469 | -71.272793 |
| W2486 | MassDEP | Water Quality | Palmer River | [approximately 1600 feet upstream (north) of Providence Street, Rehoboth (in the downstream end of the oxbow)] | 41.803718 | -71.272594 |

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_PM30 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River @ Providence Street, Rehoboth | 41.800378 | -71.272824 |
| EPA_PM31 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River @ Reed St Bridge, downstream of dam, Rehoboth | 41.80917 | -71.278281 |
| EPA_PM44 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River just upstream confluence Rocky Run, Rehoboth | 41.783752 | -71.276089 |

### *Biological Monitoring Information*

## Habitat and Flow Data (anthropogenic alterations)

**EPA Discrete Total Suspended Solids Data (2016-2019).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | TSS Count | TSS Max (mg/L) | TSS Avg (mg/L) | TSS Count >25 |
|---|---|---|---|---|---|---|
| EPA_PM30 | 04/19/16 | 11/09/16 | 8 | 9.8 | 3.9 | 0 |

| Station Code | Start Date | End Date | TSS Count | TSS Max (mg/L) | TSS Avg (mg/L) | TSS Count >25 |
|---|---|---|---|---|---|---|
| EPA_PM30 | 04/20/17 | 11/14/17 | 8 | 3.5 | 2.9 | 0 |
| EPA_PM30 | 04/24/18 | 11/05/18 | 8 | 6.3 | 3 | 0 |
| EPA_PM30 | 05/13/19 | 11/06/19 | 6 | 8 | 4.7 | 0 |
| EPA_PM31 | 04/19/16 | 11/09/16 | 8 | 6 | 3.7 | 0 |
| EPA_PM31 | 04/20/17 | 11/14/17 | 8 | 15 | 4.5 | 0 |
| EPA_PM31 | 04/24/18 | 11/05/18 | 8 | 24 | 6.9 | 0 |
| EPA_PM31 | 05/13/19 | 11/06/19 | 6 | 6 | 3.8 | 0 |
| EPA_PM44 | 04/19/16 | 11/09/16 | 8 | 45 | 13.5 | 1 |
| EPA_PM44 | 04/20/17 | 11/14/17 | 8 | 11 | 4.9 | 0 |
| EPA_PM44 | 04/24/18 | 11/05/18 | 8 | 22 | 7.1 | 0 |
| EPA_PM44 | 04/29/19 | 11/06/19 | 8 | 7.5 | 4.6 | 0 |

## *Physico-chemical Water Quality Information*

### DO, pH, Temperature

**EPA Estuarine Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | % Meas. <5.0 | % Meas. <4.0 |
|---|---|---|---|---|---|---|---|
| EPA_PM30 | 10/23/12 | 10/23/12 | 1 | 7.7 | 7.7 | 0 | 0 |
| EPA_PM30 | 07/09/13 | 09/25/13 | 2 | 5.0 | 7.2 | 0 | 0 |
| EPA_PM31 | 10/23/12 | 10/23/12 | 1 | 8.2 | 8.2 | 0 | 0 |
| EPA_PM31 | 07/09/13 | 09/25/13 | 2 | 5.9 | 7.8 | 0 | 0 |
| EPA_PM44 | 07/09/13 | 07/09/13 | 1 | 5.5 | 5.5 | 0 | 0 |

**EPA Estuarine Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer Index is June 1 – Sept 15]

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count >29.4 |
|---|---|---|---|---|---|---|---|
| EPA_PM30 | 10/23/12 | 10/23/12 | 1 | 0 | 12.8 | 12.8 | 0 |
| EPA_PM30 | 07/09/13 | 09/25/13 | 2 | 1 | 26.0 | 20.6 | 0 |
| EPA_PM30 | 04/19/16 | 11/09/16 | 8 | 4 | 25.5 | 16.2 | 0 |
| EPA_PM30 | 04/20/17 | 11/14/17 | 8 | 4 | 22.1 | 16.4 | 0 |
| EPA_PM30 | 04/24/18 | 11/05/18 | 8 | 3 | 24.7 | 16.1 | 0 |
| EPA_PM30 | 04/29/19 | 11/06/19 | 8 | 3 | 22.6 | 15.6 | 0 |
| EPA_PM31 | 10/23/12 | 10/23/12 | 1 | 0 | 14.0 | 14.0 | 0 |
| EPA_PM31 | 07/09/13 | 09/25/13 | 2 | 1 | 25.3 | 20.5 | 0 |
| EPA_PM31 | 04/19/16 | 11/09/16 | 8 | 4 | 26.3 | 17.2 | 0 |
| EPA_PM31 | 04/20/17 | 11/14/17 | 8 | 4 | 22.3 | 16.7 | 0 |
| EPA_PM31 | 04/24/18 | 11/05/18 | 8 | 3 | 24.2 | 16.2 | 0 |
| EPA_PM31 | 04/29/19 | 11/06/19 | 8 | 3 | 22.6 | 15.9 | 0 |
| EPA_PM44 | 07/09/13 | 07/09/13 | 1 | 1 | 28.4 | 28.4 | 0 |
| EPA_PM44 | 04/19/16 | 11/09/16 | 8 | 4 | 29.4 | 17.8 | 0 |

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count >29.4 |
|---|---|---|---|---|---|---|---|
| EPA_PM44 | 04/20/17 | 11/14/17 | 8 | 4 | 24.4 | 17.6 | 0 |
| EPA_PM44 | 04/24/18 | 11/05/18 | 8 | 3 | 28.0 | 17.3 | 0 |
| EPA_PM44 | 04/29/19 | 11/06/19 | 8 | 3 | 25.3 | 17.1 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_PM30 | 10/23/12 | 10/23/12 | 1 | 7.7 | 7.7 | 0 | 0 |
| EPA_PM30 | 07/09/13 | 09/25/13 | 2 | 5.9 | 7.6 | 1 | 1 |
| EPA_PM31 | 10/23/12 | 10/23/12 | 1 | 6.3 | 6.3 | 1 | 0 |
| EPA_PM31 | 07/09/13 | 09/25/13 | 2 | 6.0 | 7.8 | 1 | 0 |
| EPA_PM44 | 07/09/13 | 07/09/13 | 1 | 6.7 | 6.7 | 0 | 0 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**MassDEP Nutrient Enrichment Indicator Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | Delta DO Max (mg/L) | Delta DO Avg (mg/L) | DO Sat Max (%) | pH Max (SU) | Count Algal Obsv. | Dense/V. Dense Film/Fila. Algae |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W0633 | 2014 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |
| W0633 | 2016 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |
| W2486 | 2014 | -- | -- | -- | -- | -- | -- | -- | -- | 2 | 0 |

**EPA Summer Seasonal Total Nitrogen Data (2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Total nitrogen data collected May-Sept]

| Station Code | Start Date | End Date | Seasonal TN Count | Seasonal TN Min (mg/L) | Seasonal TN Max (mg/L) | Seasonal TN Avg (mg/L) |
|---|---|---|---|---|---|---|
| EPA_PM30 | 05/17/16 | 09/13/16 | 5 | 0.6 | 1.7 | 1.0 |
| EPA_PM30 | 05/31/17 | 09/14/17 | 5 | 0.6 | 0.7 | 0.6 |
| EPA_PM30 | 05/09/18 | 09/19/18 | 5 | 0.5 | 0.6 | 0.6 |
| EPA_PM30 | 05/13/19 | 09/24/19 | 5 | 0.5 | 0.7 | 0.6 |
| EPA_PM31 | 05/17/16 | 09/13/16 | 5 | 0.3 | 0.7 | 0.4 |
| EPA_PM31 | 05/31/17 | 09/14/17 | 5 | 0.4 | 0.5 | 0.5 |
| EPA_PM31 | 05/09/18 | 09/19/18 | 5 | 0.3 | 0.5 | 0.4 |
| EPA_PM31 | 05/13/19 | 09/24/19 | 5 | 0.3 | 0.5 | 0.4 |
| EPA_PM44 | 05/17/16 | 09/13/16 | 5 | 0.5 | 1.0 | 0.8 |
| EPA_PM44 | 05/31/17 | 09/14/17 | 5 | 0.5 | 0.7 | 0.6 |
| EPA_PM44 | 05/09/18 | 09/19/18 | 5 | 0.6 | 1.1 | 0.7 |
| EPA_PM44 | 05/13/19 | 09/24/19 | 5 | 0.6 | 0.7 | 0.6 |

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

**EPA Estuarine Total Ammonia Nitrogen (TAN) Data (2017 & 2019).** (EPA 2020) (MassDEP Undated 3)

[TAN= $NH_3$ + $NH_4^+$]

| Station Code | Start Date | End Date | TAN Count | TAN Min (mg/L) | TAN Max (mg/L) | TAN Avg (mg/L) |
|---|---|---|---|---|---|---|
| EPA_PM30 | 11/14/17 | 11/14/17 | 1 | 0.08 | 0.08 | 0.08 |
| EPA_PM30 | 04/29/19 | 11/06/19 | 7 | 0.07 | 0.13 | 0.09 |
| EPA_PM31 | 11/14/17 | 11/14/17 | 1 | 0.08 | 0.08 | 0.08 |
| EPA_PM31 | 04/29/19 | 11/06/19 | 8 | 0.07 | 0.16 | 0.09 |
| EPA_PM44 | 11/14/17 | 11/14/17 | 1 | 0.16 | 0.16 | 0.16 |
| EPA_PM44 | 04/29/19 | 11/06/19 | 8 | 0.07 | 0.11 | 0.08 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH; therefore, the Fish Consumption Use for this Palmer River AU (MA53-05) is Not Assessed. | |

## Shellfish Harvesting

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | YES |
| **2022 Use Attainment Summary** | |
| Palmer River (MA53-05): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0419 sq mi (46%). The sum of the approved, conditionally approved, and restricted shellfish growing areas represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0419 sq mi (46%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of prohibited and approved, conditionally approved, and/or restricted. Alert due to prohibited area >= 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment, so the Shellfish Harvesting Use is evaluated as not supporting. | |

### *Shellfish Growing Area Classifications*

**MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

| Area Name | Waterbody/Area Description | Classification | Area (Sq. Mi.) | Area (% of AU) |
|---|---|---|---|---|
| MHB5.0 | Palmer River | Prohibited | 0.04191 | 46.3% |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | NO |
| **2022 Use Attainment Summary** | |

MassDEP staff recorded aesthetics observations at six sites along this Palmer River AU (MA53-05) in Rehoboth from up to downstream stations (data years) as follows: ~3060 feet upstream of Providence Street (W2485) (2014); ~1600 feet upstream Providence Street (in the downstream end of the oxbow) (W2486) (2014); ~1460 feet upstream Providence Street (W2487) (2014); ~1050 feet upstream Providence Street (W2488) (2014); upstream Providence Street (W0633) (2016) and from the eastern shore just upstream of the confluence with Rocky Run (west of Mason Street) (W2443)(2013). There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DWM-WPP field sampling crews at any of these sites during the surveys at these stations. The Aesthetics Use for this Palmer River AU (MA53-05) is assessed as Fully Supporting based on the lack of objectionable conditions at any of the sites sampled by MassDEP staff in 2013, 2014, or 2016 .

## *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W0633 | MassDEP | Water Quality | Palmer River | [upstream/north at Providence Street, Rehoboth] | 41.800469 | -71.272793 |
| W2443 | MassDEP | Water Quality | Palmer River | [from the eastern shore just upstream of the confluence with Rocky Run (west of Mason Street), Rehoboth] | 41.783732 | -71.276178 |
| W2485 | MassDEP | Water Quality | Palmer River | [approximately 3060 feet upstream (north) of Providence Street, Rehoboth] | 41.805564 | -71.274192 |
| W2486 | MassDEP | Water Quality | Palmer River | [approximately 1600 feet upstream (north) of Providence Street, Rehoboth (in the downstream end of the oxbow)] | 41.803718 | -71.272594 |
| W2487 | MassDEP | Water Quality | Palmer River | [approximately 1460 feet upstream (north) of Providence Street, Rehoboth] | 41.803430 | -71.272970 |
| W2488 | MassDEP | Water Quality | Palmer River | [approximately 1050 feet upstream (north) of Providence Street, Rehoboth] | 41.802400 | -71.273220 |

## *Aesthetic Observations*

**Aesthetics Summary Statements for MassDEP Stations (2011-2018)** (MassDEP Undated 5)

| Station Code | Waterbody | Data Year | Field Sheet Count | Aesthetics Summary Statement |
|---|---|---|---|---|
| W0633 | Palmer River | 2014 | 2 | There are insufficient data available to assess the Aesthetics Use for the Palmer River. There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP staff at station W0633 during summer 2014 or 2016, however, data were limited (n=2 & 1 respectively). |
| W0633 | Palmer River | 2016 | 1 | There are insufficient data available to assess the Aesthetics Use for the Palmer River. There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP staff at station W0633 during summer 2014 or 2016, however, data were limited (n=2 & 1 respectively). |
| W2443 | Palmer River | 2013 | 2 | MassDEP aesthetics observations for station W2443 on Palmer River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |

| Station Code | Waterbody | Data Year | Field Sheet Count | Aesthetics Summary Statement |
|---|---|---|---|---|
| W2485 | Palmer River | 2014 | 1 | MassDEP aesthetics observations for station W2485 on Palmer River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2014. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=1). |
| W2486 | Palmer River | 2014 | 2 | MassDEP aesthetics observations for station W2486 on Palmer River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2014. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |
| W2487 | Palmer River | 2014 | 2 | MassDEP aesthetics observations for station W2487 on Palmer River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2014. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |
| W2488 | Palmer River | 2014 | 2 | MassDEP aesthetics observations for station W2488 on Palmer River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2014. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |

**Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018)** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Field Sheet Count | Field Sheet Count w/ Film & Filamentous Algae Observations | Dense/ Very Dense Film/ Filamentous Algae |
|---|---|---|---|---|
| W0633 | 2014 | 2 | 1 | 0 |
| W0633 | 2016 | 1 | 1 | 0 |
| W2443 | 2013 | 2 | 0 | 0 |
| W2485 | 2014 | 1 | 0 | 0 |
| W2486 | 2014 | 2 | 2 | 0 |
| W2487 | 2014 | 2 | 0 | 0 |
| W2488 | 2014 | 2 | 0 | 0 |

**MassDEP Aesthetics Observations (2011-2018)** (MassDEP Undated 8)

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W0633 | Palmer River | 2014 | Color | None | 2 | 2 |
| W0633 | Palmer River | 2014 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W0633 | Palmer River | 2014 | Odor | None | 2 | 2 |
| W0633 | Palmer River | 2014 | Scum | Not Applicable (N/A) | 2 | 2 |
| W0633 | Palmer River | 2014 | Turbidity | Slightly Turbid | 2 | 2 |
| W0633 | Palmer River | 2016 | Color | None | 1 | 1 |
| W0633 | Palmer River | 2016 | Objectionable Deposits | Not Applicable (N/A) | 1 | 1 |
| W0633 | Palmer River | 2016 | Odor | None | 1 | 1 |
| W0633 | Palmer River | 2016 | Scum | Not Applicable (N/A) | 1 | 1 |

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W0633 | Palmer River | 2016 | Turbidity | Slightly Turbid | 1 | 1 |
| W2443 | Palmer River | 2013 | Color | Light Yellow/Tan | 1 | 2 |
| W2443 | Palmer River | 2013 | Color | None | 1 | 2 |
| W2443 | Palmer River | 2013 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W2443 | Palmer River | 2013 | Odor | None | 2 | 2 |
| W2443 | Palmer River | 2013 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2443 | Palmer River | 2013 | Turbidity | Moderately Turbid | 2 | 2 |
| W2485 | Palmer River | 2014 | Color | None | 1 | 1 |
| W2485 | Palmer River | 2014 | Objectionable Deposits | Not Applicable (N/A) | 1 | 1 |
| W2485 | Palmer River | 2014 | Odor | None | 1 | 1 |
| W2485 | Palmer River | 2014 | Scum | Not Applicable (N/A) | 1 | 1 |
| W2485 | Palmer River | 2014 | Turbidity | Moderately Turbid | 1 | 1 |
| W2486 | Palmer River | 2014 | Color | None | 2 | 2 |
| W2486 | Palmer River | 2014 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W2486 | Palmer River | 2014 | Odor | None | 2 | 2 |
| W2486 | Palmer River | 2014 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2486 | Palmer River | 2014 | Turbidity | Moderately Turbid | 1 | 2 |
| W2486 | Palmer River | 2014 | Turbidity | Slightly Turbid | 1 | 2 |
| W2487 | Palmer River | 2014 | Color | None | 2 | 2 |
| W2487 | Palmer River | 2014 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W2487 | Palmer River | 2014 | Odor | None | 2 | 2 |
| W2487 | Palmer River | 2014 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2487 | Palmer River | 2014 | Turbidity | Moderately Turbid | 2 | 2 |
| W2488 | Palmer River | 2014 | Color | None | 2 | 2 |
| W2488 | Palmer River | 2014 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W2488 | Palmer River | 2014 | Odor | None | 2 | 2 |
| W2488 | Palmer River | 2014 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2488 | Palmer River | 2014 | Turbidity | Moderately Turbid | 2 | 2 |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |

*Enterococcus* bacteria samples were collected (1 to 7 times per year) by EPA staff from this Palmer River AU (MA 53-15) between 2013 and 2019 at the following sampling stations (data years): Reed St Bridge (EPA_PM31), Providence Street (EPA_PM30), Mainstem Palmer River just upstream confluence Rocky Run (EPA_PM44), and under westbound I-195 (EPA_PM60). Analysis of the data (when sufficient) indicated a worsening of water quality moving downstream. Data analysis of the multi-year moderate frequency sampling data sets can be summarized as follows: At the upstream end (Reed St. Bridge EPA_PM31) 0% of intervals had GMs >35 cfu/100ml in three of the four years, 0-1 samples exceeded the 130 cfu/100ml STV in three of the four years and only 18% of the cumulative intervals had GMs >35 cfu/100ml. However, further downstream at Providence St. (EPA_PM30) and close to the confluence of Rocky Run (EPA_PM44), analysis indicated 83-100% of intervals had GMs >35 cfu/100ml in four of the sample years and 3-6 samples exceeded the 130 cfu/100ml STV in four of the sample years. MassDEP conducted BST work in 2013-2019, in support of the EPA/RIDEM/MassDEP joint effort under the "National Water Quality Initiative" (NWQI). No human source of bacteria was ever identified, though agricultural land-use was noted in the watershed and this potential source was investigated/addressed by the Mass Association of Conservation Districts in partnership with NRCS, under the NWQI from 2014-2018. The Primary Contact Recreational Use for this Palmer River AU (MA53-15) is assessed as Not Supporting because of elevated *Enterococcus* bacteria which is being added as an impairment.

## *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_PM30 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River @ Providence Street, Rehoboth | 41.800378 | -71.272824 |
| EPA_PM31 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River @ Reed St Bridge, downstream of dam, Rehoboth | 41.80917 | -71.278281 |
| EPA_PM44 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River just upstream confluence Rocky Run, Rehoboth | 41.783752 | -71.276089 |
| EPA_PM60 | Environmental Protection Agency | Water Quality | Palmer River | Palmer River Mainstem under westbound I-195, Rehoboth | 41.779038 | -71.278985 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_PM30 | Environmental Protection Agency | Enterococci | 06/20/14 | 06/20/14 | 1 | 391 | 391 | 391 |
| EPA_PM30 | Environmental Protection Agency | Enterococci | 07/09/15 | 09/09/15 | 2 | 298 | 2910 | 931 |
| EPA_PM30 | Environmental Protection Agency | Enterococci | 04/19/16 | 10/12/16 | 7 | 10 | 651 | 113 |
| EPA_PM30 | Environmental Protection Agency | Enterococci | 04/20/17 | 10/12/17 | 7 | 30 | 464 | 137 |
| EPA_PM30 | Environmental Protection Agency | Enterococci | 04/24/18 | 10/18/18 | 7 | 10 | 2481 | 80 |
| EPA_PM30 | Environmental Protection Agency | Enterococci | 04/29/19 | 10/22/19 | 7 | 20 | 2143 | 203 |

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_PM31 | Environmental Protection Agency | Enterococci | 07/09/15 | 09/09/15 | 2 | 20 | 120 | 49 |
| EPA_PM31 | Environmental Protection Agency | Enterococci | 04/19/16 | 10/12/16 | 7 | 2 | 41 | 9 |
| EPA_PM31 | Environmental Protection Agency | Enterococci | 04/20/17 | 10/12/17 | 7 | 10 | 85 | 18 |
| EPA_PM31 | Environmental Protection Agency | Enterococci | 04/24/18 | 10/18/18 | 7 | 10 | 426 | 67 |
| EPA_PM31 | Environmental Protection Agency | Enterococci | 04/29/19 | 10/22/19 | 5 | 10 | 144 | 22 |
| EPA_PM44 | Environmental Protection Agency | Enterococci | 07/09/15 | 09/09/15 | 2 | 2760 | 3650 | 3174 |
| EPA_PM44 | Environmental Protection Agency | Enterococci | 04/19/16 | 10/12/16 | 7 | 54 | 1842 | 355 |
| EPA_PM44 | Environmental Protection Agency | Enterococci | 04/20/17 | 10/12/17 | 7 | 31 | 7701 | 503 |
| EPA_PM44 | Environmental Protection Agency | Enterococci | 04/24/18 | 10/18/18 | 7 | 10 | 2481 | 120 |
| EPA_PM44 | Environmental Protection Agency | Enterococci | 04/29/19 | 10/22/19 | 7 | 31 | 2064 | 351 |
| EPA_PM60 | Environmental Protection Agency | Enterococci | 07/10/13 | 07/10/13 | 1 | 602 | 602 | 602 |

## EPA_PM30 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 391 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 931 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 2 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 113 |
| #GMI | 6 |
| #GMI Ex | 5 |
| %GMI Ex | 83 |
| n>STV | 4 |
| %n>STV | 57 |

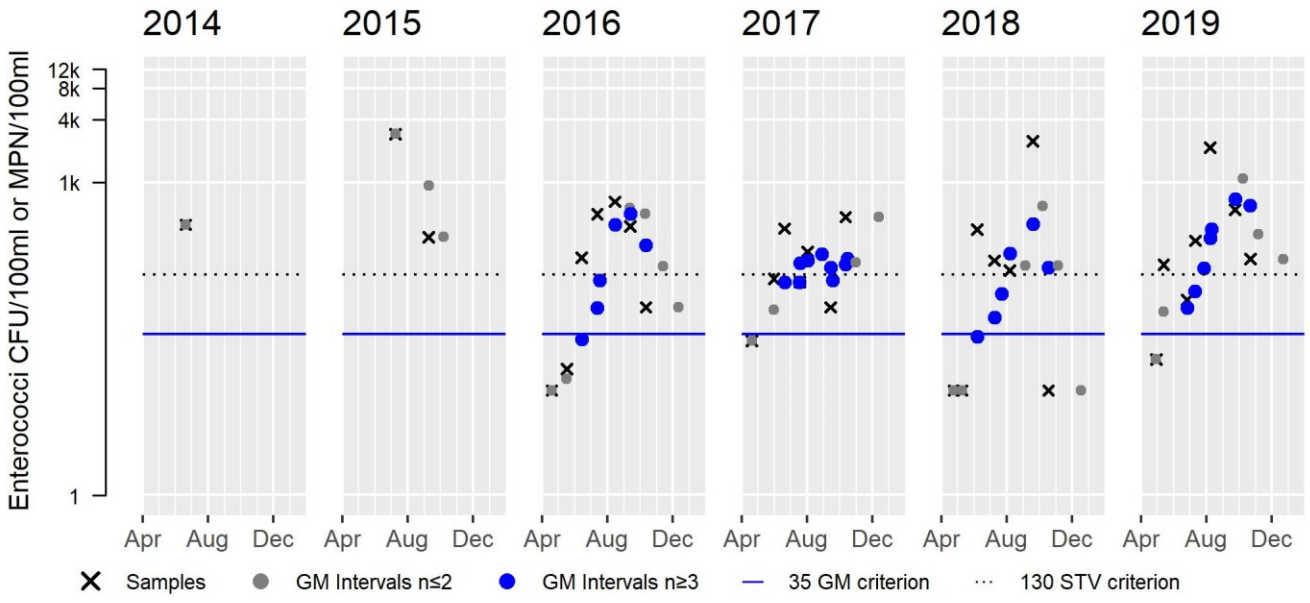
| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 137 |
| #GMI | 9 |
| #GMI Ex | 9 |
| %GMI Ex | 100 |
| n>STV | 3 |
| %n>STV | 43 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 80 |
| #GMI | 6 |
| #GMI Ex | 5 |
| %GMI Ex | 83 |
| n>STV | 4 |
| %n>STV | 57 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 203 |
| #GMI | 7 |
| #GMI Ex | 7 |
| %GMI Ex | 100 |
| n>STV | 5 |
| %n>STV | 71 |

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

| *Variable* | Cumulative %GMI Ex (all years) | Cumulative %GMI Ex (last 5 years) |
|---|---|---|
| *Result* | 93 | 93 |



## EPA_PM31 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 49 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 9 |
| #GMI | 6 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

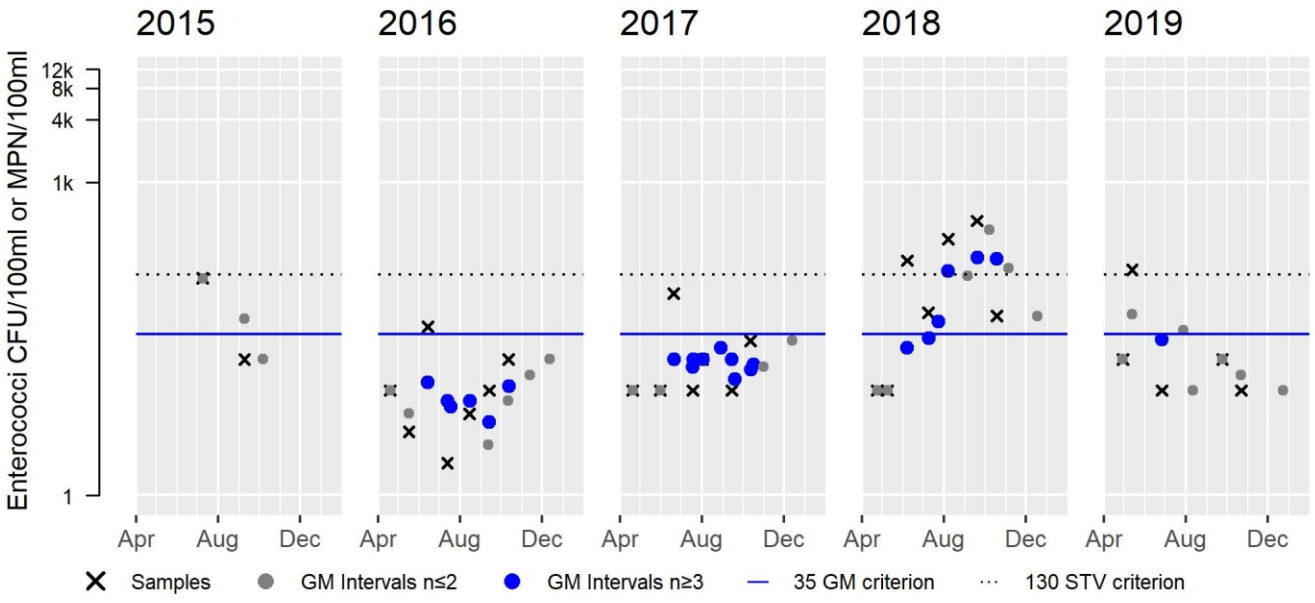
| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 18 |
| #GMI | 9 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 67 |
| #GMI | 6 |
| #GMI Ex | 4 |
| %GMI Ex | 67 |
| n>STV | 3 |
| %n>STV | 43 |

| Var | Res |
|---|---|
| Samples | 5 |
| SeasGM | 22 |
| #GMI | 1 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 20 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 18 |



## EPA_PM44 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 3174 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 2 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 355 |
| #GMI | 6 |
| #GMI Ex | 6 |
| %GMI Ex | 100 |
| n>STV | 5 |
| %n>STV | 71 |

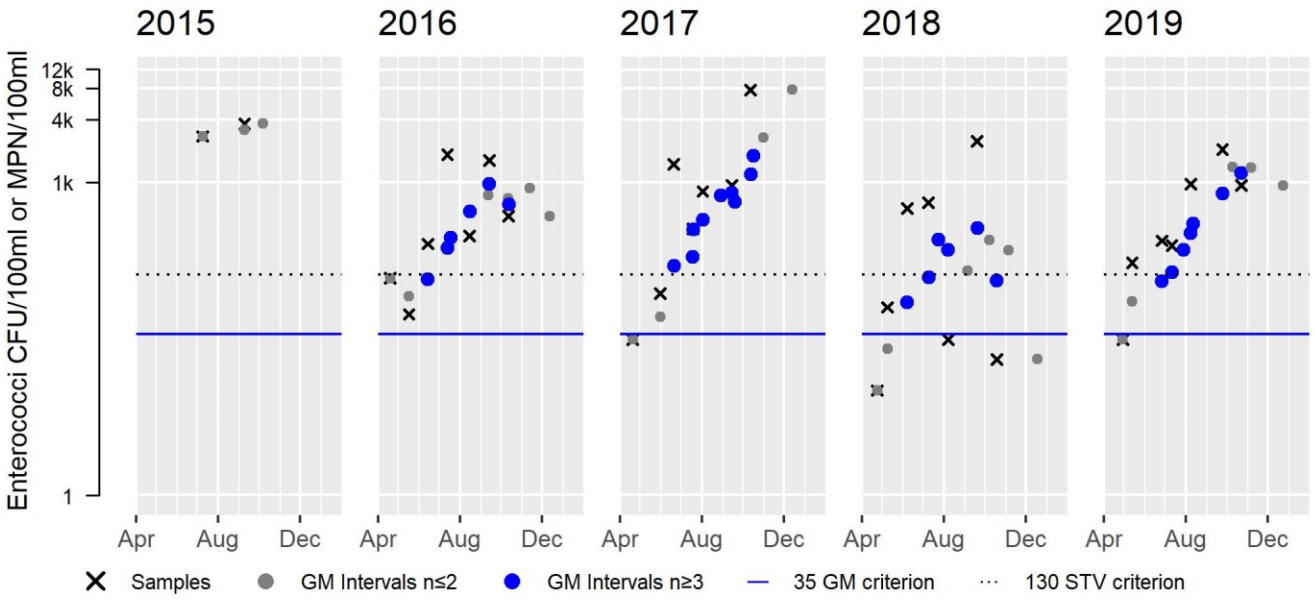
| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 503 |
| #GMI | 9 |
| #GMI Ex | 9 |
| %GMI Ex | 100 |
| n>STV | 5 |
| %n>STV | 71 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 120 |
| #GMI | 6 |
| #GMI Ex | 6 |
| %GMI Ex | 100 |
| n>STV | 3 |
| %n>STV | 43 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 351 |
| #GMI | 7 |
| #GMI Ex | 7 |
| %GMI Ex | 100 |
| n>STV | 6 |
| %n>STV | 86 |

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

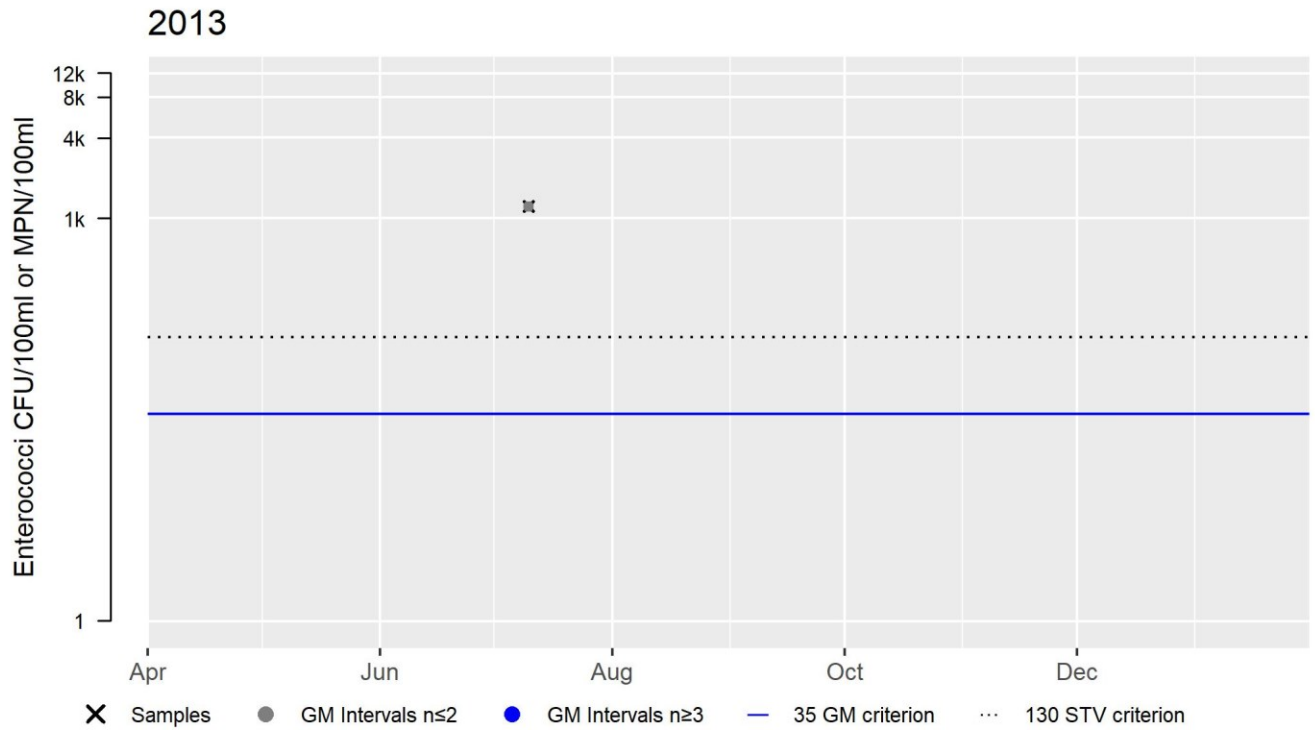
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 100 |



## EPA_PM59 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 1223 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

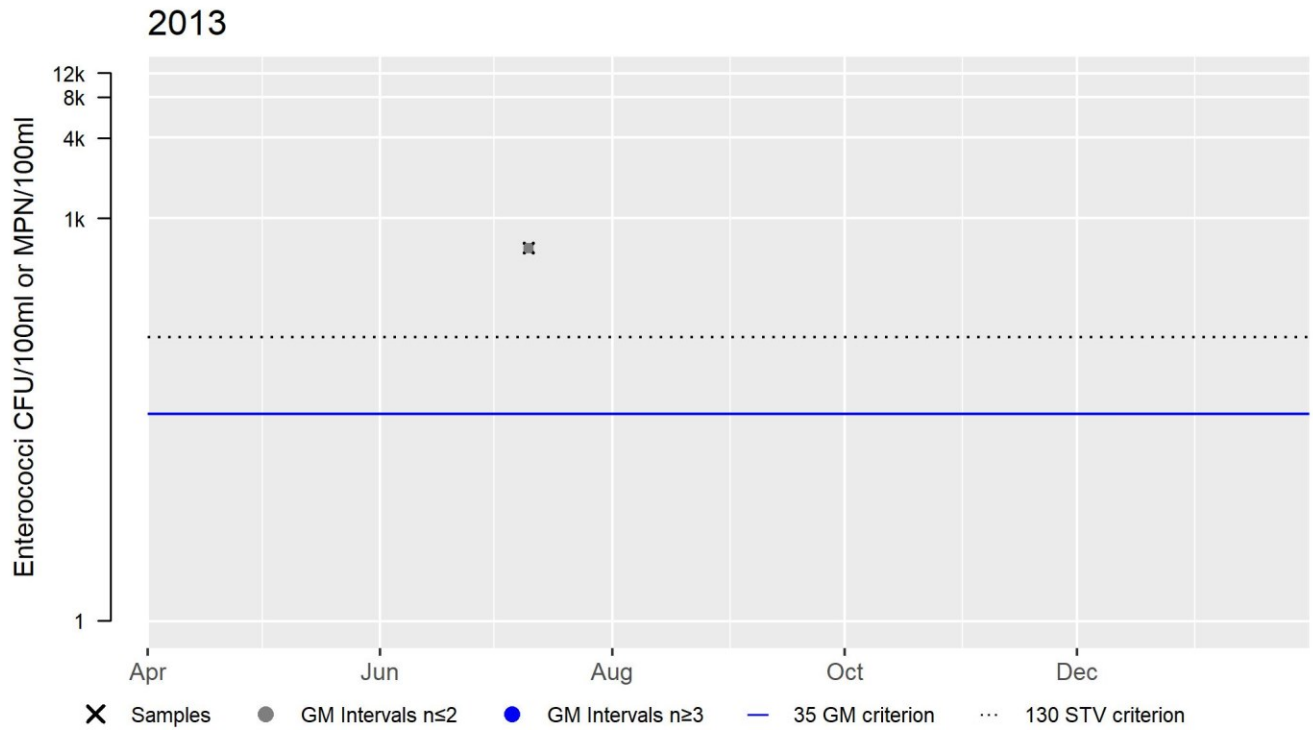
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



EPA_PM60 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 602 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

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




**MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019** (MassDEP Undated 1)

| **Summary** |
|---|
| BST work was conducted at 28 sites in the Palmer River AU (MA53-05) between 2013-2019, in support of the EPA/RIDEM/DEP joint effort in the Palmer River watershed (NWQI). *E. coli* counts ranged 10 to >24,196MPN and Enterococcus ranged 209 - 1,223MPN. A significant increase in *E. coli* counts was noted ~two-thirds of the way down the AU, (though upstream of the Rocky Run discharge) between sample sites upstream and downstream of a series of oxbows and drainage ditches in the saltmarsh. It was theorized that the decrease in flow through the oxbows and in the ditches may encourage proliferation of bacteria, especially combined with the copious phragmites and other saltmarsh vegetation which are known to harbor bacteria. No human source of bacteria was ever identified in the AU. Agricultural land-use was noted in the watershed and this potential source was investigated/addressed by the Mass Association of Conservation Districts (MACD) in partnership with NRCS, under the NWQI from 2014-2018. |

### *Shellfish Growing Area Classifications*

**MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

| **Summary** |
|---|
| Palmer River (MA53-05): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0419 sq mi (46%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than "approved", the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data. |

## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |
| *Enterococcus* bacteria samples were collected (1 to 7 times per year) by EPA staff from this Palmer River AU (MA 53-15) between 2013 and 2019 at the following sampling stations (data years): Reed St Bridge (EPA_PM31), Providence Street (EPA_PM30), Mainstem Palmer River just upstream confluence Rocky Run (EPA_PM44), and under westbound I-195 (EPA_PM60). Analysis of the data (when sufficient) indicated a worsening of water quality moving downstream. Data analysis of these multi-year moderate frequency sampling data sets can be summarized as follows: At the upstream end (Reed St. Bridge EPA_PM31) 0% of intervals had GMs >175 cfu/100ml in three of the four years, only one sample exceeded the 350cfu/100ml STV in the four years, and only 7% of the cumulative intervals had GMs >175 cfu/100ml. However, further downstream at Providence St. (EPA_PM30) and close to the confluence of Rocky Run (EPA_PM44), dat analysis indicated 29-90% of intervals had GMs >175 cfu/100ml in the four moderate frequency sample years (2016-2019) and two or more samples exceeded the 350 cfu/100ml STV in three to four of the sample years. The cumulative GM exceedances >175cfu/100ml were 42 and 79% at EPA_PM30 and EPA_PM44, respectively. MassDEP conducted BST work in 2013-2019, in support of the EPA/RIDEM/MassDEP joint effort under the "National Water Quality Initiative" (NWQI). No human source of bacteria was ever identified, though agricultural land-use was noted in the watershed and this potential source was investigated/addressed by the Mass Association of Conservation Districts in partnership with NRCS, under the NWQI from 2014-2018. The Secondary Contact Recreational Use for this Palmer River AU (MA53-15) is assessed as Not Supporting because of elevated *Enterococcus* bacteria which is being added as an impairment. | |

### *Monitoring Stations*

| **Station Code** | **Organization** | **Type** | **Water Body** | **Station Description** | **Latitude** | **Longitude** |
|---|---|---|---|---|---|---|
| EPA_PM30 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River @ Providence Street, Rehoboth | 41.800378 | -71.272824 |
| EPA_PM31 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River @ Reed St Bridge, downstream of dam, Rehoboth | 41.80917 | -71.278281 |
| EPA_PM44 | Environmental Protection Agency | Water Quality | Palmer River | Mainstem Palmer River just upstream confluence Rocky Run, Rehoboth | 41.783752 | -71.276089 |
| EPA_PM60 | Environmental Protection Agency | Water Quality | Palmer River | Palmer River Mainstem under westbound I-195, Rehoboth | 41.779038 | -71.278985 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_PM30 | Environmental Protection Agency | Enterococci | 06/20/14 | 06/20/14 | 1 | 391 | 391 | 391 |
| EPA_PM30 | Environmental Protection Agency | Enterococci | 07/09/15 | 09/09/15 | 2 | 298 | 2910 | 931 |
| EPA_PM30 | Environmental Protection Agency | Enterococci | 04/19/16 | 11/09/16 | 8 | 10 | 651 | 105 |
| EPA_PM30 | Environmental Protection Agency | Enterococci | 04/20/17 | 11/14/17 | 8 | 30 | 464 | 118 |
| EPA_PM30 | Environmental Protection Agency | Enterococci | 04/24/18 | 11/05/18 | 8 | 10 | 2481 | 82 |
| EPA_PM30 | Environmental Protection Agency | Enterococci | 04/29/19 | 11/06/19 | 8 | 20 | 2143 | 190 |
| EPA_PM31 | Environmental Protection Agency | Enterococci | 07/09/15 | 09/09/15 | 2 | 20 | 120 | 49 |
| EPA_PM31 | Environmental Protection Agency | Enterococci | 04/19/16 | 11/09/16 | 8 | 2 | 41 | 9 |
| EPA_PM31 | Environmental Protection Agency | Enterococci | 04/20/17 | 11/14/17 | 8 | 10 | 85 | 16 |
| EPA_PM31 | Environmental Protection Agency | Enterococci | 04/24/18 | 11/05/18 | 8 | 10 | 426 | 68 |
| EPA_PM31 | Environmental Protection Agency | Enterococci | 04/29/19 | 11/06/19 | 6 | 10 | 144 | 22 |
| EPA_PM44 | Environmental Protection Agency | Enterococci | 07/09/15 | 09/09/15 | 2 | 2760 | 3650 | 3174 |
| EPA_PM44 | Environmental Protection Agency | Enterococci | 04/19/16 | 11/09/16 | 8 | 54 | 1842 | 318 |
| EPA_PM44 | Environmental Protection Agency | Enterococci | 04/20/17 | 11/14/17 | 8 | 31 | 7701 | 503 |
| EPA_PM44 | Environmental Protection Agency | Enterococci | 04/24/18 | 11/05/18 | 8 | 10 | 2481 | 138 |
| EPA_PM44 | Environmental Protection Agency | Enterococci | 04/29/19 | 11/06/19 | 8 | 31 | 2064 | 356 |
| EPA_PM60 | Environmental Protection Agency | Enterococci | 07/10/13 | 07/10/13 | 1 | 602 | 602 | 602 |

## EPA_PM30 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 391 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 931 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 105 |
| #GMI | 8 |
| #GMI Ex | 4 |
| %GMI Ex | 50 |
| n>STV | 3 |
| %n>STV | 38 |

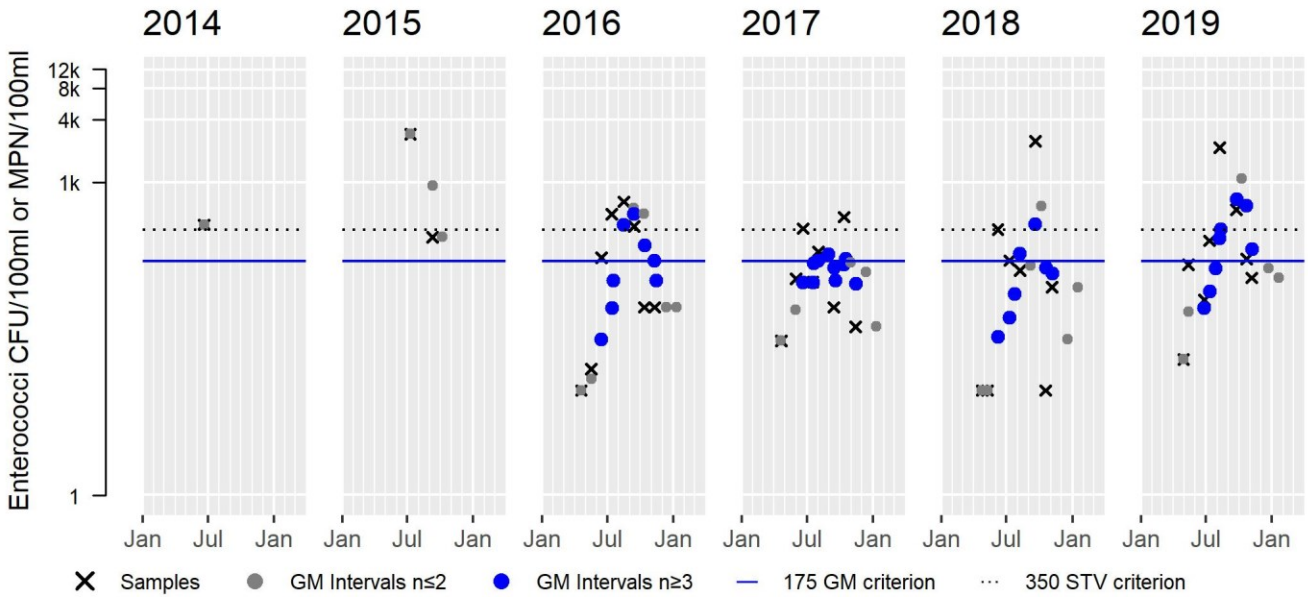
| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 118 |
| #GMI | 10 |
| #GMI Ex | 3 |
| %GMI Ex | 30 |
| n>STV | 2 |
| %n>STV | 25 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 82 |
| #GMI | 7 |
| #GMI Ex | 2 |
| %GMI Ex | 29 |
| n>STV | 1 |
| %n>STV | 12 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 190 |
| #GMI | 8 |
| #GMI Ex | 5 |
| %GMI Ex | 62 |
| n>STV | 2 |
| %n>STV | 25 |

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

| *Variable* | Cumulative %GMI Ex (all years) | Cumulative %GMI Ex (last 5 years) |
|---|---|---|
| *Result* | 42 | 42 |



## EPA_PM31 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 49 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 9 |
| #GMI | 8 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

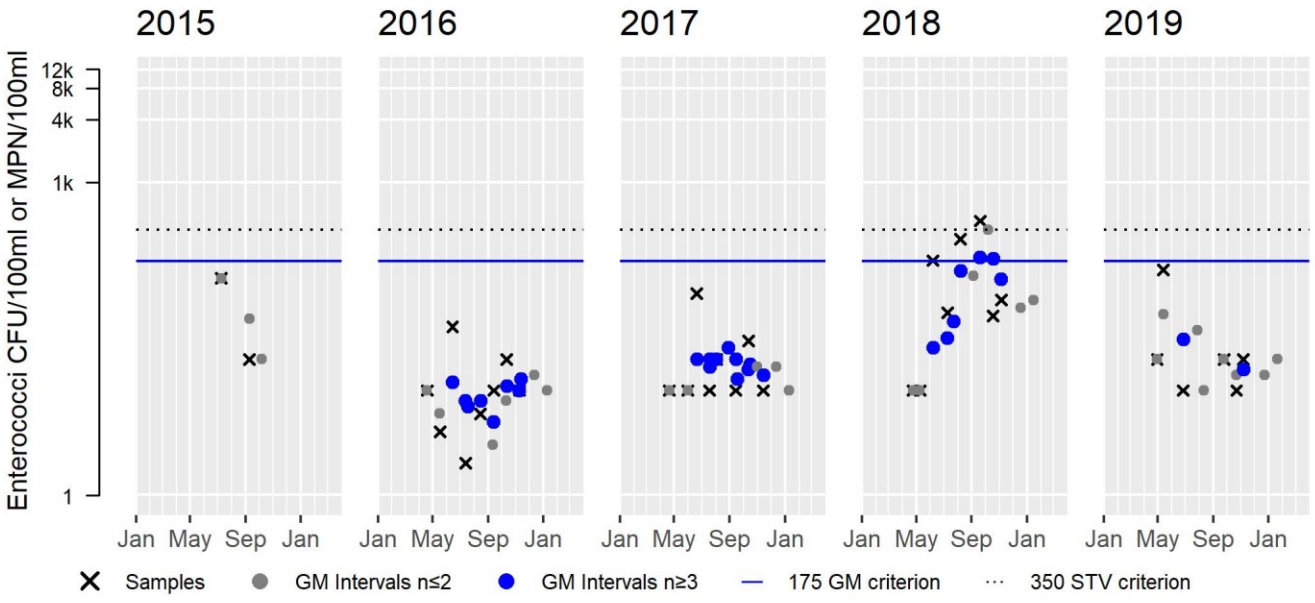
| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 16 |
| #GMI | 10 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 68 |
| #GMI | 7 |
| #GMI Ex | 2 |
| %GMI Ex | 29 |
| n>STV | 1 |
| %n>STV | 12 |

| Var | Res |
|---|---|
| Samples | 6 |
| SeasGM | 22 |
| #GMI | 2 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 7 |



## EPA_PM44 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 3174 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 2 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 318 |
| #GMI | 8 |
| #GMI Ex | 7 |
| %GMI Ex | 88 |
| n>STV | 3 |
| %n>STV | 38 |

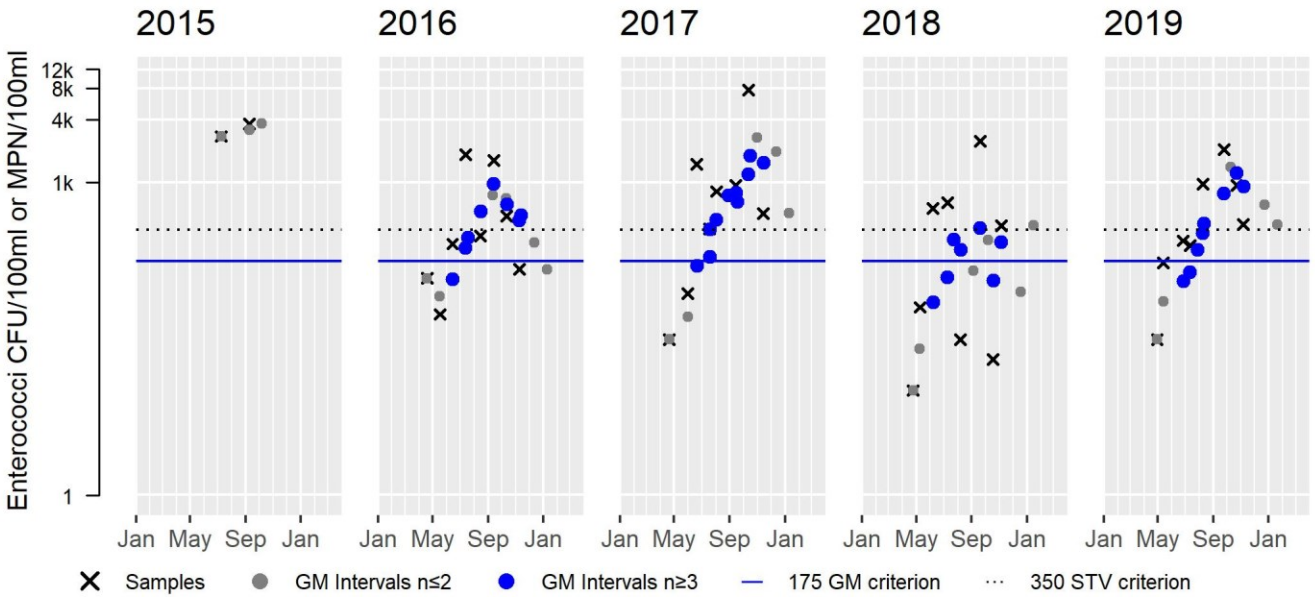
| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 503 |
| #GMI | 10 |
| #GMI Ex | 9 |
| %GMI Ex | 90 |
| n>STV | 6 |
| %n>STV | 75 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 138 |
| #GMI | 7 |
| #GMI Ex | 4 |
| %GMI Ex | 57 |
| n>STV | 4 |
| %n>STV | 50 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 356 |
| #GMI | 8 |
| #GMI Ex | 6 |
| %GMI Ex | 75 |
| n>STV | 4 |
| %n>STV | 50 |

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

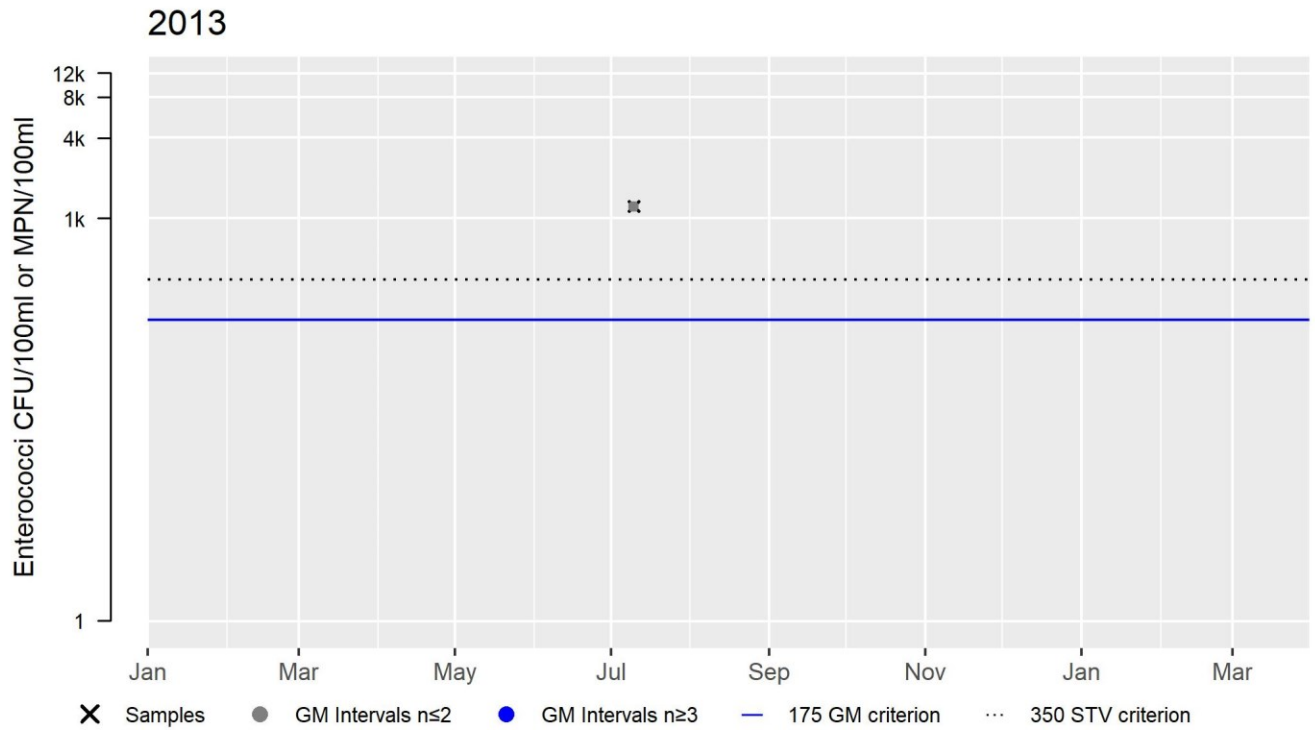
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 79 |



## EPA_PM59 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 1223 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

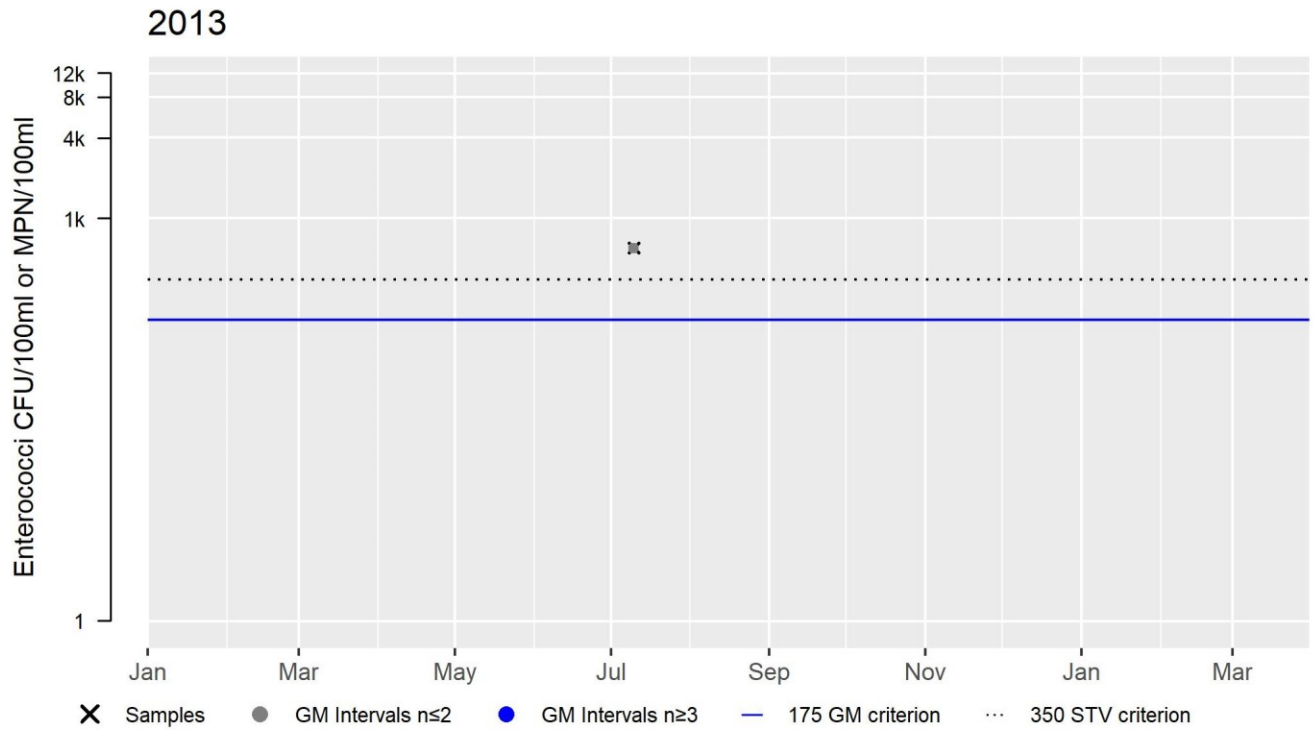
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



EPA_PM60 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 602 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

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




## *Shellfish Growing Area Classifications*

**MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

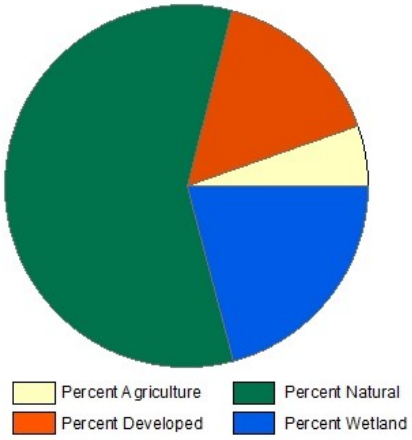
| **Summary** |
|---|
| Palmer River (MA53-05): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0419 sq mi (46%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data. |

# Palmer River (MA53-22)

| | |
|---|---|
| **Location:** | Headwaters, confluence of the East and West branches of the Palmer River, Rehoboth to the inlet of Shad Factory Pond, Rehoboth (formerly part of 2014 segment: Palmer River MA53-04). |
| **AU Type:** | RIVER |
| **AU Size:** | 4.8 MILES |
| **Classification/Qualifier:** | B: CWF |

**Palmer River - MA53-22**

Watershed Area: 30.88 square miles




| Landuse Type | Entire Basin | 5km Radius Proximal Subbasin | 100m Stream Buffer | Proximal Stream Buffer |
|---|---|---|---|---|
| Land Use Area (square miles) | 30.88 | 9.45 | 8.19 | 3.29 |
| Agriculture | 5.4% | 8.9% | 6.6% | 8.7% |
| Developed | 15.6% | 23.4% | 13.4% | 17.1% |
| Natural | 58.2% | 60.3% | 52.5% | 61.5% |
| Wetland | 20.8% | 7.4% | 27.6% | 12.7% |
| Impervious Cover | 5.2% | | | |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 5 | 5 | Benthic Macroinvertebrates | | Added |
| 5 | 5 | Escherichia Coli (E. Coli) | 35086 | Unchanged |
| 5 | 5 | Fecal Coliform | 35086 | Unchanged |
| 5 | 5 | Lack of a Coldwater Assemblage | | Added |
| 5 | 5 | Temperature | | Unchanged |

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

| Impairment | Source (Confirmed Y/N) | Fish, other Aquatic Life and Wildlife | Fish Consumption | Aesthetic | Primary Contact Recreation | Secondary Contact Recreation |
|---|---|---|---|---|---|---|
| Fecal Coliform | Discharges from Municipal Separate Storm Sewer Systems (MS4) (Y) | | | | X | |
| Fecal Coliform | Waterfowl (N) | | | | X | |
| Lack of a Coldwater Assemblage | Source Unknown (N) | X | | | | |
| Temperature | Source Unknown (N) | X | | | | |

## Recommendations

| 2022 Recommendations |
|---|
| ALU: MA DFG does not identify this river as a CFR and very little fish sampling has ever been conducted (there is only one historical record in their database and only one stocked brown trout was collected). How this river was originally designated as Class B cold water in the MA SWQS is unclear and warrants further investigation. Additional clean metals sampling should be conducted to better evaluate if there is a lead contamination issue. |

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | YES |
| **2022 Use Attainment Summary** | |
| MassDEP biologists sampled this Palmer River AU (MA53-22) just upstream of Danforth St., Rehoboth during the summer of 2013 as part of the MAP2 monitoring project. Survey results of this Cold Water habitat can be briefly summarized as follows: the benthic community (Station B0838) IBI score was indicative of moderately degraded conditions (46), and the fish sample collected in August 2013 (Sample ID 5052) did contain one fluvial species (tessellated darter) that comprised 19% of the sample but no cold water species were documented. The water quality data (including both deployed probe and discrete sampling efforts at Station W2380) can be summarized as follows: minimum dissolved oxygen 6.5mg/L during the three 3-5 day deploys, maximum temperature 26.1°C and exceeded the 7-DADM (designated Cold Water criteria) 63 times, with a max 24hr rolling average of 24.8°C, pH 6.5SU (n=3), no indications of any nutrient enrichment problems (seasonal average total phosphorus concentrations 0.044mg/L, max diel DO shift 0.9mg/L, maximum saturation 94.9%, maximum pH 6.5SU, and no observations of dense/very dense filamentous algae), and low concentrations of total ammonia nitrogen (maximum 0.06mg/L with no toxicity estimated), chloride (maximum 31mg/L), and low specific conductance (max 124µS/cm, n=3). There were no acute or chronic metals criteria exceedances except for lead which slightly exceeded chronic criteria (TUs 1.1 and 1.3). The Aquatic Life Use for this Palmer River AU (MA53-22) will continue to be assessed as Not Supporting. Benthic Macroinvertebrates and Lack of a Coldwater Assemblage impairments are being added based on the biological data collected in the river at Danforth St. while the temperature impairment is being carried forward. An Alert is also being identified since both clean metals samples collected in May and July 2013 exceeded chronic lead criteria. | |

#### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| 5052 | MassDEP | Fish Community | Palmer River | 830 ft US/E of Danforth St xing | 41.84611 | -71.26255 |

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| B0838 | MassDEP | Benthic | Palmer River/ | [approximately 255 meters upstream/east from Danforth Street, Rehoboth, MA] | 41.846114 | -71.262551 |
| W2380 | MassDEP | Water Quality | Palmer River | [approximately 830 feet upstream/east from Danforth Street, Rehoboth] | 41.846114 | -71.262551 |

## *Biological Monitoring Information*

### Benthic Macroinvertebrate Data

**MassDEP Benthic Macroinvertebrate Data (2011-2017).** (MassDEP Undated 4)

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

| Station Code | Collection Date | Collection Method | Index Type | Organism Count | Index Score | Index Biological Condition Class |
|---|---|---|---|---|---|---|
| B0838 | 07/11/13 | RBP multihab | Statewide_Low_Gradient | 283 | 46 | MD |

### Fish Community Data and DELTS

**Fish Community Data (2012-2019) Provided by MassDFG.** (MassDFG 2020) (MassDEP Undated 2)

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

[Species List: AE = American Eel, B = Bluegill, CP = Chain Pickerel, LMB = Largemouth Bass, P = Pumpkinseed, RP = Redfin Pickerel, SL = Sea Lamprey, TD = Tesselated Darter]

| Sample ID | Sample Date | Method | Sample Type | Gradient | Total Taxa | Total Ind | Cold Ind % | Fluvial Taxa | Fluvial Ind % | Intol Ind % | I/MT MG Taxa | I/MT MG Ind % | Notables | CFR | Species List |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5052 | 08/20/13 | NS | TP | | 8 | 112 | 0% | 1 | 19% | 0% | 4 | 32% | No | No | AE, B, CP, LMB, P, RP, SL, TD, |

## *Physico-chemical Water Quality Information*

### DO, pH, Temperature

**MassDEP Short-term Continuous Dissolved Oxygen Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[Note: Most deploys 3-5 days in length; Day Count= total # of days over all deploys; XDADMin= 3-5 Day Average of the Daily Minima, XDADA= 3-5 Day Average of the Daily Average, CW= Coldwater, WW= Warmwater]

| Station Code | Data Year | Deploys Count | Day Count | DO Min (mg/L) | Min XDADMin (mg/L) | Min XDADA (mg/L) | Delta DO Max (mg/L) | Count CW XDADMin <6.0 | Count CW 1Day Min <5.0 | Count WW Early Life Stages XDADA <6.5 | Count WW Early Life Stages 1Day Min <5.0 | Count WW Other Life Stages XDADMin <5.0 | Count WW Other Life Stages 1Day Min <4.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W2380 | 2013 | 3 | 12 | 6.5 | 6.8 | 7.1 | 0.9 | 0 | 0 | 0 | 0 | 0 | 0 |

**MassDEP Discrete Dissolved Oxygen Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| W2380 | 05/08/13 | 09/04/13 | 3 | 7 | 7.3 | 0 | 0 | 0 |

**MassDEP Long-term Continuous Temperature Data (Summer Index 2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Start Date | End Date | Index Count | 7day Count | Max Daily Mean (°C) | Max Temp (°C) | Max 7DADM (°C) | Max 7DADA (°C) | Count CWTier1 7DADM >20 | Count CWTier1 Daily Mean >23.5 | Count CWTier2 7DADA >21 | Count CWTier2 Daily Mean >24.1 | Count WW 7DADM >27.7 | Count WW Daily Mean >28.3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W2380 | 06/01/13 | 09/03/13 | 95 | 92 | 24.7 | 26.1 | 25.3 | 24.2 | 63 | 11 | 30 | 3 | 0 | 0 |

**MassDEP Short-term Continuous Temperature Data (Summer Index 2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[Summer Index is June 1 – Sept 15; Most Deploys 3-5 Days in Length; Day Count= total # of days over all deploys; Max Daily Mean= Maximum 24-Hour Average, XDADM= 3-5 Day Average of the Daily Maxima, XDADA= 3-5 Day Average of the Daily Average, CW= Coldwater, WW= Warmwater]

| Station Code | Data Year | Deploys Count | Day Count | Max Daily Mean (°C) | Max Temp (°C) | Max XDADM (°C) | Max XDADA (°C) | Count CWTier1 XDADM >20 | Count CWTier1 Daily Mean >23.5 | Count CWTier2 XDADA >21 | Count CWTier2 Daily Mean >24.1 | Count WW XDADM >27.7 | Count WW Daily Mean >28.3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W2380 | 2013 | 3 | 12 | 23.7 | 24.9 | 23.1 | 22.2 | 2 | 1 | 1 | 0 | 0 | 0 |

**24-hour Rolling Average Calculations for MassDEP Short- and Long-term Continuous Temperature Data (Summer Index 2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Start Date | End Date | Count Days Deployed | 24hr Rolling Count | Max 24hr Avg Rolling Temp (°C) | Count CWTier1 24hr Avg Rolling >23.5 °C | Count CWTier2 24hr Avg Rolling >24.1 °C | Count WW 24hr Avg Rolling >28.3°C |
|---|---|---|---|---|---|---|---|---|
| W2380 | 06/01/13 | 09/04/13 | 96 | 4588 | 24.8 | 497 | 214 | 0 |
| W2380 | 06/06/13 | 08/13/13 | 68 | 579 | 24.0 | 35 | 0 | 0 |

**MassDEP Discrete Temperature Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)
[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| W2380 | 05/08/13 | 09/04/13 | 5 | 4 | 24.6 | 21.0 | 2 | 2 | 0 | 0 |

**MassDEP Discrete pH Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 & >8.3 | pH Count <6.0 & >8.8 |
|---|---|---|---|---|---|---|---|
| W2380 | 05/08/13 | 09/04/13 | 3 | 6.5 | 6.5 | 0 | 0 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**MassDEP Nutrient Enrichment Indicator Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | Delta DO Max (mg/L) | Delta DO Avg (mg/L) | DO Sat Max (%) | pH Max (SU) | Count Algal Obsv. | Dense/V. Dense Film/Fila. Algae |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W2380 | 2013 | 5 | 0.024 | 0.094 | 0.044 | 0.9 | 0.6 | 94.9 | 6.5 | 5 | 0 |

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

**MassDEP Clean Metals Water Column Data (2011-2018), Acute Criteria Violations.** (MassDEP Undated 8) (MassDEP Undated 5)
[CMC= Criterion Maximum Concentration, TU= Toxic Unit]

| Station Code | Data Year | Metals Count | As CMC TU >1 | Cd CMC TU >1 | Cr III CMC TU >1 | Cu CMC TU >1 | Pb CMC TU >1 | Ni CMC TU >1 | Ag CMC TU >1 | Zn CMC TU >1 |
|---|---|---|---|---|---|---|---|---|---|---|
| W2380 | 2013 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**MassDEP Clean Metals Water Column Data (2011-2018), Chronic Criteria Violations.** (MassDEP Undated 8) (MassDEP Undated 5)
[CCC= Criterion Continuous Concentration, TU= Toxic Unit]

| Station Code | Data Year | Metals Count | As CCC TU >1 | Cd CCC TU >1 | Cr III CCC TU >1 | Cu CCC TU >1 | Pb CCC TU >1 | Ni CCC TU >1 | Se CCC TU >1 | Zn CCC TU >1 |
|---|---|---|---|---|---|---|---|---|---|---|
| W2380 | 2013 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |

**MassDEP Clean Metals Water Column Data (2011-2018), Selected TU Calculations.** (MassDEP Undated 8) (MassDEP Undated 5)

[CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

| Station Code | Sample Date | Cd CMC TU | Cd CCC TU | Cu CMC TU | Cu CCC TU | Pb CMC TU | Pb CCC TU |
|---|---|---|---|---|---|---|---|
| W2380 | 05/06/13 | 0.3 | 0.6 | 0.2 | 0.24 | 0.0 | 1.1 |
| W2380 | 07/29/13 | 0.2 | 0.4 | 0.2 | 0.25 | 0.1 | 1.3 |

**MassDEP Dissolved Aluminum Water Column Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[Since only dissolved aluminum data were available, these data were compared to the default freshwater criteria for total recoverable aluminum (TRA), presented in Appendix E of MassDEP's 2022 CALM. As dissolved Al is a fraction of TRA, an exceedance count of 0 does not rule out violations of the TRA criteria. CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

| Station Code | Data Year | Dissolved Al Count | Al Min (mg/L) | Al Max (mg/L) | Al Avg (mg/L) | Al CMC TU Max | Al CCC TU Max | Al CMC TU >1 | Al CCC TU >1 |
|---|---|---|---|---|---|---|---|---|---|
| W2380 | 2013 | 2 | 0.069 | 0.088 | 0.079 | 0.2 | 0.4 | 0 | 0 |

**MassDEP Total Ammonia Nitrogen (TAN) Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[TAN= NH3 + NH4+]

| Station Code | Data Year | TAN Count | TAN Min (mg/L) | TAN Max (mg/L) | TAN Avg (mg/L) | Count TAN >Chronic | Count TAN >Acute |
|---|---|---|---|---|---|---|---|
| W2380 | 2013 | 5 | 0.020 | 0.060 | 0.032 | 0 | 0 |

**MassDEP Chloride Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Chloride Count | Chloride Min (mg/L) | Chloride Max (mg/L) | Chloride Avg (mg/L) | Count Chloride >230 | Count Chloride >860 |
|---|---|---|---|---|---|---|---|
| W2380 | 2013 | 5 | 19 | 31 | 24 | 0 | 0 |

**MassDEP Discrete Specific Conductance Data (2011-2018) Compared to Estimated Chloride Criteria.** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W2380 | 05/08/13 | 09/04/13 | 3 | 109 | 124 | 0 | 0 | 0 | 0 | 0 | 0 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH; therefore, the Fish Consumption Use for this Palmer River AU (MA53-22) is Not Assessed. | |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|

| | |
|---|---|
| Fully Supporting | NO |
| **2022 Use Attainment Summary** | |
| MassDEP staff recorded aesthetics observations ~830ft upstream of Danforth St in Rehoboth (W2380) during the summer of 2018 (n=8). There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) noted. The Aesthetics Use for this Palmer River AU (MA53-22) is assessed as Fully Supporting. | |

## *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W2380 | MassDEP | Water Quality | Palmer River | [approximately 830 feet upstream/east from Danforth Street, Rehoboth] | 41.846114 | -71.262551 |

## *Aesthetic Observations*

**Aesthetics Summary Statements for MassDEP Stations (2011-2018)** (MassDEP Undated 5)

| Station Code | Waterbody | Data Year | Field Sheet Count | Aesthetics Summary Statement |
|---|---|---|---|---|
| W2380 | Palmer River | 2013 | 8 | MassDEP aesthetics observations for station W2380/MAP2-347 on Palmer River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. |

**Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018)** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Field Sheet Count | Field Sheet Count w/ Film & Filamentous Algae Observations | Dense/ Very Dense Film/ Filamentous Algae |
|---|---|---|---|---|
| W2380 | 2013 | 8 | 5 | 0 |

**MassDEP Aesthetics Observations (2011-2018)** (MassDEP Undated 8)

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W2380 | Palmer River | 2013 | Color | Light Yellow/Tan | 6 | 8 |
| W2380 | Palmer River | 2013 | Color | Unobservable | 2 | 8 |
| W2380 | Palmer River | 2013 | Objectionable Deposits | No | 7 | 8 |
| W2380 | Palmer River | 2013 | Objectionable Deposits | Unobservable | 1 | 8 |
| W2380 | Palmer River | 2013 | Odor | None | 7 | 8 |
| W2380 | Palmer River | 2013 | Odor | NR | 1 | 8 |
| W2380 | Palmer River | 2013 | Scum | No | 7 | 8 |
| W2380 | Palmer River | 2013 | Scum | Yes | 1 | 8 |
| W2380 | Palmer River | 2013 | Turbidity | Moderately Turbid | 1 | 8 |
| W2380 | Palmer River | 2013 | Turbidity | None | 4 | 8 |
| W2380 | Palmer River | 2013 | Turbidity | Slightly Turbid | 2 | 8 |
| W2380 | Palmer River | 2013 | Turbidity | Unobservable | 1 | 8 |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |

**2022 Use Attainment Summary**

*E. coli* bacteria samples were collected by MassDEP staff in this Palmer River AU (MA53-22) ~830 feet upstream from Danforth Street, Rehoboth (W2380) between May and September 2013 (n=5). Data analysis indicated 100% of the intervals had GMs >126 cfu/100ml, and two of the samples exceeded the 410 cfu/100ml STV. The seasonal GM was 427cfu/100ml. Since the *E. coli* concentrations exceeded the use attainment impairment thresholds for this single-year limited frequency dataset, the Primary Contact Recreational Use for this Palmer River AU (MA53-22) will continue to be assessed as Not Supporting with the *E. coli* and Fecal Coliform impairments being carried forward.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W2380 | MassDEP | Water Quality | Palmer River | [approximately 830 feet upstream/east from Danforth Street, Rehoboth] | 41.846114 | -71.262551 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (MassDEP Undated 8) (MassDEP Undated 5)

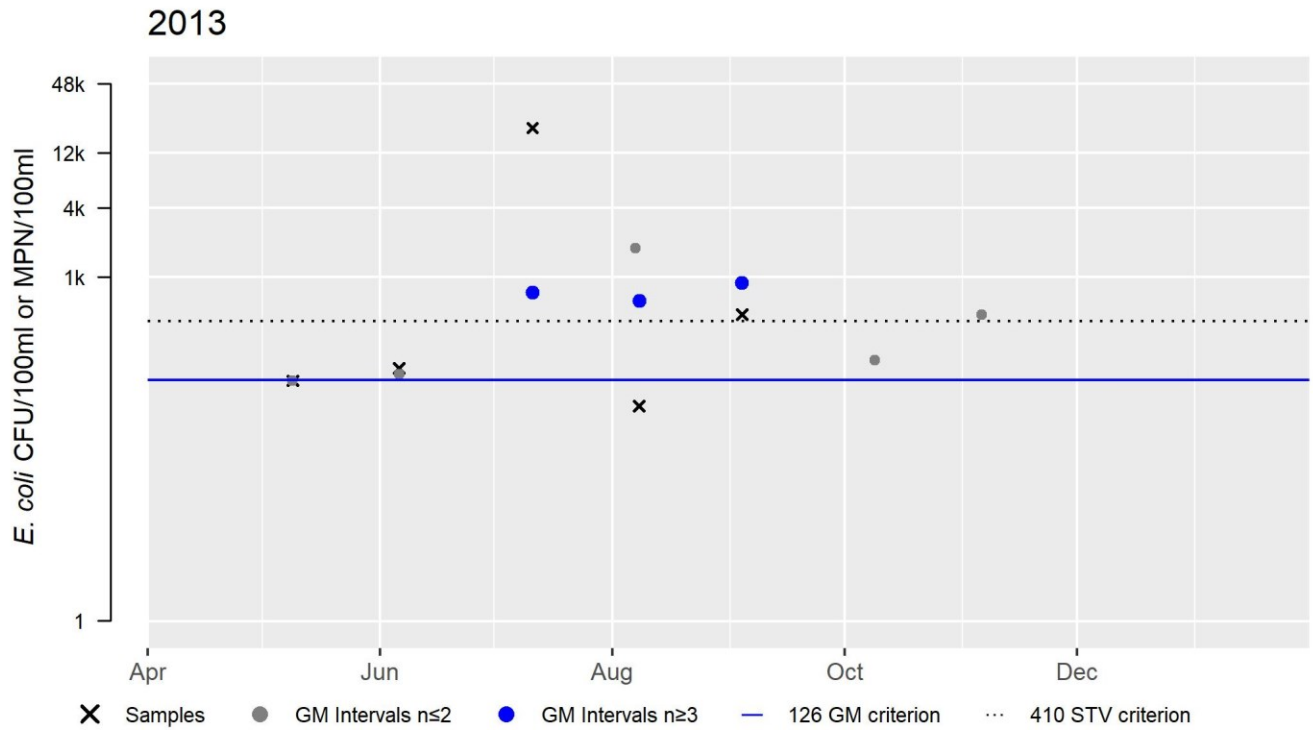
[Result units are CFU/100ml or MPN/100ml]

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| W2380 | MassDEP | E. coli | 05/09/13 | 09/04/13 | 5 | 75 | 19860 | 427 |

W2380 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 5 |
| SeasGM | 427 |
| #GMI | 3 |
| #GMI Ex | 3 |
| %GMI Ex | 100 |
| n>STV | 2 |
| %n>STV | 40 |

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




**MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019** (MassDEP Undated 1)

| **Summary** |
|---|
| BST work was conducted in 2014 and 2015 on an unnamed tributary discharging to the upstream half of the Palmer River AU (MA53-22). Two sites were sampled on the tributary (at River Street and Colonial Way), with *E. coli* counts ranging 44 to 1,986MPN. Potential agricultural sources of bacteria were observed in this area and human sources were ruled out. |

## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|
| Fully Supporting | NO |
| **2022 Use Attainment Summary** | |

*E. coli* bacteria data were collected by MassDEP staff in this Palmer River AU (MA53-22) ~830 feet upstream from Danforth Street, Rehoboth (W2380) between May and September 2013 (n=5). Data analysis indicated 67% of intervals had GMs >630 cfu/100ml, and one sample exceeded the 1260 cfu/100ml STV. The seasonal GM was 427cfu/100ml. Since the E. coli concentrations were below the use attainment impairment thresholds for this single-year limited frequency dataset, the Secondary Contact Recreational Use for this Palmer River AU (MA53-22) will continue to be assessed as Fully Supporting.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W2380 | MassDEP | Water Quality | Palmer River | [approximately 830 feet upstream/east from Danforth Street, Rehoboth] | 41.846114 | -71.262551 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (MassDEP Undated 8) (MassDEP Undated 5)

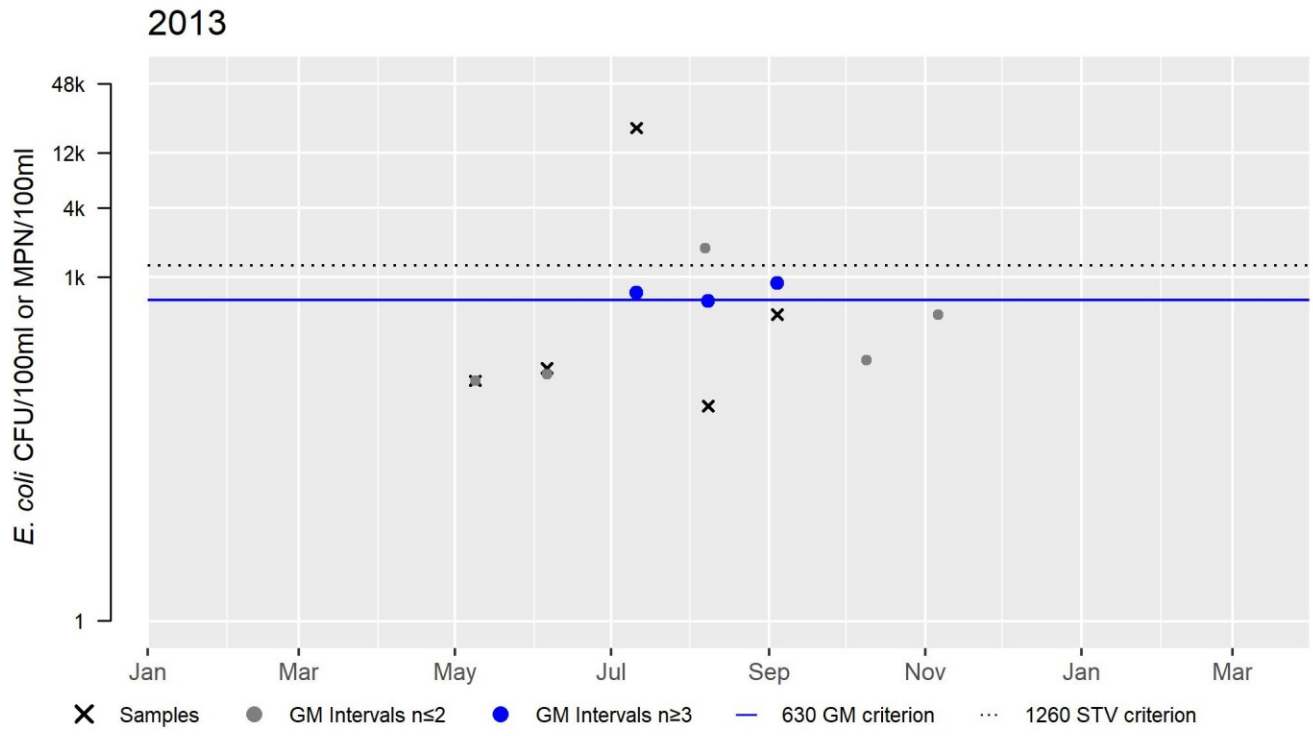
[Result units are CFU/100ml or MPN/100ml]

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| W2380 | MassDEP | E. coli | 05/09/13 | 09/04/13 | 5 | 75 | 19860 | 427 |

## W2380 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 5 |
| SeasGM | 427 |
| #GMI | 3 |
| #GMI Ex | 2 |
| %GMI Ex | 67 |
| n>STV | 1 |
| %n>STV | 20 |

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

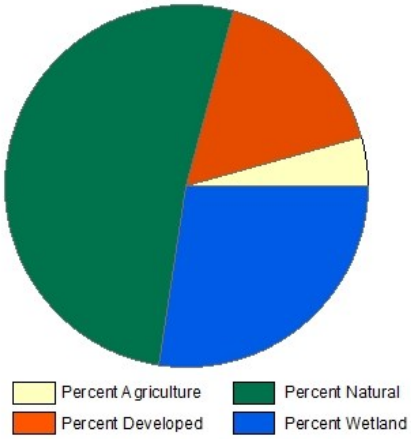


# Rocky Run (MA53-16)

| | |
|---|---|
| **Location:** | Headwaters in wetland east of Simmons Street, Rehoboth to approximately 0.1 mile east of Mason Street, Rehoboth (prior to 2010 this segment included estuarine portion). |
| **AU Type:** | RIVER |
| **AU Size:** | 8.6 MILES |
| **Classification/Qualifier:** | B |

**Rocky Run - MA53-16**

Watershed Area: 10.42 square miles




| Landuse Type | Entire Basin | 5km Radius Proximal Subbasin | 100m Stream Buffer | Proximal Stream Buffer |
|---|---|---|---|---|
| Land Use Area (square miles) | 10.42 | 6.39 | 2.56 | 1.96 |
| Agriculture | 4.4% | 6.1% | 5.1% | 6.2% |
| Developed | 16.4% | 20.9% | 10.1% | 10.9% |
| Natural | 51.8% | 52.8% | 44.2% | 45.6% |
| Wetland | 27.4% | 20.2% | 40.6% | 37.3% |
| Impervious Cover | 5.3% | | | |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 4a | 5 | Enterococcus | | Added |
| 4a | 5 | Escherichia Coli (E. Coli) | 35096 | Unchanged |
| 4a | 5 | Fecal Coliform | 35096 | Unchanged |

| Impairment | Source (Confirmed Y/N) | Fish, other Aquatic Life and Wildlife | Fish Consumption | Aesthetic | Primary Contact Recreation | Secondary Contact Recreation |
|---|---|---|---|---|---|---|
| Enterococcus | Agriculture (Y) | | | | X | |
| Enterococcus | On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y) | | | | X | |
| Enterococcus | Source Unknown (N) | | | | X | |
| Escherichia Coli (E. Coli) | Agriculture (Y) | | | | X | |
| Escherichia Coli (E. Coli) | On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y) | | | | X | |
| Escherichia Coli (E. Coli) | Source Unknown (N) | | | | X | |
| Fecal Coliform | Agriculture (Y) | | | | X | |

| Impairment | Source (Confirmed Y/N) | Fish, other Aquatic Life and Wildlife | Fish Consumption | Aesthetic | Primary Contact Recreation | Secondary Contact Recreation |
|---|---|---|---|---|---|---|
| Fecal Coliform | On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y) | | | | X | |
| Fecal Coliform | Source Unknown (N) | | | | X | |

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | NO |

**2022 Use Attainment Summary**

EPA conducted discrete water quality monitoring in this Rocky Run AU (MA53-16) at Plain St. (EPA_RR24); Martin St. (EPA_RR25), Davis St. (EPA_RR03) & north of Meadowlark Drive (EPA_RR22A); once or twice a year in 2012-2013 & ~monthly 2016-2019. The data were generally indicative of good water quality (a summary incorporating data from all stations follows): max temperature 24.1°C (n=24); minimum DO 4.8mg/L (n=12) (1/12 measurements <5mg/L at EPA_RR26). pH was low at times (especially in the upstream reach of the AU) ranging from 4.4SU at EPA_RR24 to 7.7SU at EPA_RR03, (8/11 measurements <6.5SU & 7/11 measurements <6.0SU). These low measurements are of note but are judged to be a natural condition, due to the large amount of wetland (wooded swamp) in the watershed, as depicted by the MassGIS detailed wetland layer. There was no indication of nutrient enrichment: seasonal avg total phosphorus was consistent around 0.05mg/L (typically n=5); with a max DO saturation of 84.5% & no observations of dense/very dense filamentous algae. The seasonal average Total Nitrogen concentrations ranged from 0.5 to 0.8mg/L (typically n=5). In estuarine systems, seasonal average TN >0.5mg/L can be indicative of degraded overall health; however, this AU is not fully estuarine despite what conditions the downstream end of the AU might experience (i.e., occasional tidal influence), thus the elevated averages should not be problematic. Specific conductance was occasionally high at Davis St (EPA_RR03) (max of 4,082µS/cm in 2016), which resulted in a few exceedances of the estimated chloride criteria (three times out of 35 measurements, with no consecutive incidents). There were no exceedances of the estimated chloride criteria at the other four sampling stations (n=20). Total ammonia nitrogen was low, with a max of 0.14mg/L (n=17) with no toxicity estimated. The Aquatic Life Use of this Rocky Run AU (MA53-16) is assessed as Fully Supporting based on the EPA water quality data.

#### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W0638 | MassDEP | Water Quality | Rocky Run | [at power lines crossing Davis Street, Rehoboth. (just east of First Street)] | 41.781622 | -71.250434 |

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_RR03 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Davis Street, Rehoboth | 41.781562 | -71.250278 |

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_RR22A | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run in wetlands off Meadow Lark | 41.784408 | -71.261287 |
| EPA_RR24 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Plain Street, Rehoboth | 41.811416 | -71.230218 |
| EPA_RR25 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Martin Street, Rehoboth | 41.797461 | -71.239522 |
| EPA_RR26 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Pleasant Street, Rehoboth | 41.779463 | -71.239194 |

## *Biological Monitoring Information*

### Habitat and Flow Data (anthropogenic alterations)

**EPA Discrete Total Suspended Solids Data (2016-2019).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | TSS Count | TSS Max (mg/L) | TSS Avg (mg/L) | TSS Count >25 |
|---|---|---|---|---|---|---|
| EPA_RR03 | 04/19/16 | 11/09/16 | 8 | 6.5 | 3.3 | 0 |
| EPA_RR03 | 04/20/17 | 11/14/17 | 8 | 3 | 2.6 | 0 |
| EPA_RR03 | 04/24/18 | 11/05/18 | 8 | 2.8 | 2.5 | 0 |
| EPA_RR03 | 10/22/19 | 11/06/19 | 2 | 2.5 | 2.5 | 0 |
| EPA_RR22A | 06/07/18 | 11/05/18 | 6 | 8.3 | 3.5 | 0 |
| EPA_RR22A | 06/26/19 | 11/06/19 | 6 | 16 | 6.8 | 0 |

## *Physico-chemical Water Quality Information*

### DO, pH, Temperature

**EPA Freshwater Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| EPA_RR03 | 10/23/12 | 10/23/12 | 1 | 6.2 | 6.2 | 0 | 0 | 0 |
| EPA_RR03 | 07/09/13 | 09/25/13 | 2 | 5.5 | 7.2 | 0 | 0 | 0 |
| EPA_RR24 | 10/23/12 | 10/23/12 | 1 | 5.9 | 5.9 | 0 | 0 | 0 |
| EPA_RR24 | 07/09/13 | 09/25/13 | 2 | 5.6 | 6.5 | 0 | 0 | 0 |
| EPA_RR25 | 10/23/12 | 10/23/12 | 1 | 6.5 | 6.5 | 0 | 0 | 0 |
| EPA_RR25 | 07/09/13 | 09/25/13 | 2 | 7.1 | 7.6 | 0 | 0 | 0 |
| EPA_RR26 | 10/23/12 | 10/23/12 | 1 | 6.0 | 6.0 | 0 | 0 | 0 |
| EPA_RR26 | 07/09/13 | 09/25/13 | 2 | 4.8 | 6.1 | 1 | 1 | 0 |

**EPA Freshwater Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA_RR03 | 10/23/12 | 10/23/12 | 1 | 0 | 11.3 | 11.3 | 0 | 0 | 0 | 0 |
| EPA_RR03 | 07/09/13 | 09/25/13 | 2 | 1 | 23.4 | 17.8 | 1 | 1 | 0 | 0 |
| EPA_RR03 | 04/19/16 | 11/09/16 | 8 | 4 | 24.1 | 15.0 | 2 | 1 | 0 | 0 |
| EPA_RR03 | 04/20/17 | 11/14/17 | 8 | 4 | 21.6 | 15.7 | 2 | 0 | 0 | 0 |
| EPA_RR03 | 04/24/18 | 11/05/18 | 8 | 3 | 24.0 | 15.2 | 1 | 1 | 0 | 0 |
| EPA_RR03 | 04/29/19 | 11/06/19 | 8 | 3 | 22.0 | 15.0 | 2 | 0 | 0 | 0 |
| EPA_RR22A | 06/07/18 | 10/18/18 | 5 | 3 | 23.6 | 17.0 | 1 | 1 | 0 | 0 |
| EPA_RR22A | 05/13/19 | 10/22/19 | 6 | 3 | 21.3 | 16.9 | 2 | 0 | 0 | 0 |
| EPA_RR24 | 10/23/12 | 10/23/12 | 1 | 0 | 11.1 | 11.1 | 0 | 0 | 0 | 0 |
| EPA_RR24 | 07/09/13 | 09/25/13 | 2 | 1 | 21.5 | 16.7 | 1 | 0 | 0 | 0 |
| EPA_RR25 | 10/23/12 | 10/23/12 | 1 | 0 | 11.5 | 11.5 | 0 | 0 | 0 | 0 |
| EPA_RR25 | 07/09/13 | 09/25/13 | 2 | 1 | 23.4 | 18.3 | 1 | 1 | 0 | 0 |
| EPA_RR26 | 10/23/12 | 10/23/12 | 1 | 0 | 11.4 | 11.4 | 0 | 0 | 0 | 0 |
| EPA_RR26 | 07/09/13 | 09/25/13 | 2 | 1 | 23.1 | 17.7 | 1 | 1 | 0 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_RR03 | 10/23/12 | 10/23/12 | 1 | 6.1 | 6.1 | 1 | 0 |
| EPA_RR03 | 09/25/13 | 09/25/13 | 1 | 7.7 | 7.7 | 0 | 0 |
| EPA_RR24 | 10/23/12 | 10/23/12 | 1 | 4.8 | 4.8 | 1 | 1 |
| EPA_RR24 | 07/09/13 | 09/25/13 | 2 | 4.4 | 5.5 | 2 | 2 |
| EPA_RR25 | 10/23/12 | 10/23/12 | 1 | 5.8 | 5.8 | 1 | 1 |
| EPA_RR25 | 07/09/13 | 09/25/13 | 2 | 5.4 | 7.2 | 1 | 1 |
| EPA_RR26 | 10/23/12 | 10/23/12 | 1 | 5.9 | 5.9 | 1 | 1 |
| EPA_RR26 | 07/09/13 | 09/25/13 | 2 | 5.5 | 7.3 | 1 | 1 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**MassDEP Nutrient Enrichment Indicator Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | Delta DO Max (mg/L) | Delta DO Avg (mg/L) | DO Sat Max (%) | pH Max (SU) | Count Algal Obsv. | Dense/V. Dense Film/Fila. Algae |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W0638 | 2015 | -- | -- | -- | -- | -- | -- | -- | -- | 3 | 0 |

**EPA Freshwater Nutrient Enrichment Indicator Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)

[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | DO Sat Max (%) | pH Max (SU) |
|---|---|---|---|---|---|---|---|
| EPA_RR03 | 2012 | -- | -- | -- | -- | 58.5 | 6.1 |

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | DO Sat Max (%) | pH Max (SU) |
|---|---|---|---|---|---|---|---|
| EPA_RR03 | 2013 | -- | -- | -- | -- | 83.2 | 7.7 |
| EPA_RR03 | 2016 | 5 | 0.031 | 0.058 | 0.046 | -- | -- |
| EPA_RR03 | 2017 | 5 | 0.034 | 0.056 | 0.046 | -- | -- |
| EPA_RR03 | 2018 | 5 | 0.038 | 0.068 | 0.051 | -- | -- |
| EPA_RR03 | 2019 | 5 | 0.003 | 0.082 | 0.046 | -- | -- |
| EPA_RR22A | 2018 | 4 | 0.045 | 0.063 | 0.053 | -- | -- |
| EPA_RR22A | 2019 | 5 | 0.004 | 0.076 | 0.048 | -- | -- |
| EPA_RR24 | 2012 | -- | -- | -- | -- | 55.4 | 4.8 |
| EPA_RR24 | 2013 | -- | -- | -- | -- | 70.0 | 5.5 |
| EPA_RR25 | 2012 | -- | -- | -- | -- | 59.4 | 5.8 |
| EPA_RR25 | 2013 | -- | -- | -- | -- | 84.5 | 7.2 |
| EPA_RR26 | 2012 | -- | -- | -- | -- | 56.0 | 5.9 |
| EPA_RR26 | 2013 | -- | -- | -- | -- | 70.4 | 7.3 |

**EPA Summer Seasonal Total Nitrogen Data (2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Total nitrogen data collected May-Sept]

| Station Code | Start Date | End Date | Seasonal TN Count | Seasonal TN Min (mg/L) | Seasonal TN Max (mg/L) | Seasonal TN Avg (mg/L) |
|---|---|---|---|---|---|---|
| EPA_RR03 | 05/17/16 | 09/13/16 | 5 | 0.4 | 0.7 | 0.6 |
| EPA_RR03 | 05/31/17 | 09/14/17 | 5 | 0.5 | 0.8 | 0.6 |
| EPA_RR03 | 05/09/18 | 09/19/18 | 5 | 0.5 | 0.7 | 0.6 |
| EPA_RR03 | 05/13/19 | 09/24/19 | 5 | 0.5 | 0.6 | 0.5 |
| EPA_RR22A | 06/07/18 | 09/19/18 | 4 | 0.7 | 1.0 | 0.8 |
| EPA_RR22A | 05/13/19 | 09/24/19 | 5 | 0.5 | 0.9 | 0.7 |

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

**EPA Freshwater Total Ammonia Nitrogen (TAN) Data (2017 & 2019).** (EPA 2020) (MassDEP Undated 3)
[Toxicity evaluations made using site- and date-specific temperature plus site-specific max pH measurements from 2012 & 2013; TAN= $NH3 + NH_4^+$]

| Station Code | Start Date | End Date | TAN Count | TAN Min (mg/L) | TAN Max (mg/L) | TAN Avg (mg/L) | Count TAN >Chronic | Count TAN >Acute |
|---|---|---|---|---|---|---|---|---|
| EPA_RR03 | 11/14/17 | 11/14/17 | 1 | 0.08 | 0.08 | 0.08 | 0 | 0 |
| EPA_RR03 | 04/29/19 | 11/06/19 | 8 | 0.07 | 0.14 | 0.09 | 0 | 0 |
| EPA_RR22A | 04/29/19 | 11/06/19 | 8 | 0.07 | 0.13 | 0.08 | 0 | 0 |

**EPA Discrete Specific Conductance Data (2012-2013, 2016-2019) Compared to Estimated Chloride Criteria.** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_RR03 | 10/23/12 | 10/23/12 | 1 | 95 | 95 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_RR03 | 07/09/13 | 09/25/13 | 2 | 141 | 183 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_RR03 | 04/19/16 | 11/09/16 | 8 | 133 | 4082 | 2 | 2 | 1 | 1 | 0 | 0 |

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_RR03 | 04/20/17 | 11/14/17 | 8 | 119 | 968 | 1 | 0 | 0 | 0 | 0 | 0 |
| EPA_RR03 | 04/24/18 | 11/05/18 | 8 | 96 | 348 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_RR03 | 04/29/19 | 11/06/19 | 8 | 114 | 1157 | 1 | 1 | 0 | 0 | 0 | 0 |
| EPA_RR22A | 06/07/18 | 10/18/18 | 5 | 114 | 338 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_RR22A | 05/13/19 | 10/22/19 | 6 | 115 | 491 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_RR24 | 10/23/12 | 10/23/12 | 1 | 67 | 67 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_RR24 | 07/09/13 | 09/25/13 | 2 | 63 | 78 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_RR25 | 10/23/12 | 10/23/12 | 1 | 62 | 62 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_RR25 | 07/09/13 | 09/25/13 | 2 | 85 | 97 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_RR26 | 10/23/12 | 10/23/12 | 1 | 84 | 84 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_RR26 | 07/09/13 | 09/25/13 | 2 | 111 | 131 | 0 | 0 | 0 | 0 | 0 | 0 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH; therefore, the Fish Consumption Use for this Rocky Run AU (MA53-16) is Not Assessed. | |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | NO |
| **2022 Use Attainment Summary** | |
| MassDEP aesthetics observations for station W0638 on Rocky Run (Davis St, Rehoboth), can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2015 (n=3). The Aesthetics Use for this Rocky Run AU (MA53-16) is assessed as Fully Supporting. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W0638 | MassDEP | Water Quality | Rocky Run | [at power lines crossing Davis Street, Rehoboth. (just east of First Street)] | 41.781622 | -71.250434 |

### *Aesthetic Observations*

**Aesthetics Summary Statements for MassDEP Stations (2011-2018)** (MassDEP Undated 5)

| Station Code | Waterbody | Data Year | Field Sheet Count | Aesthetics Summary Statement |
|---|---|---|---|---|
| W0638 | Rocky Run | 2015 | 3 | MassDEP aesthetics observations for station W0638 on Rocky Run can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2015. |

**Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018)** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Field Sheet Count | Field Sheet Count w/ Film & Filamentous Algae Observations | Dense/ Very Dense Film/ Filamentous Algae |
|---|---|---|---|---|
| W0638 | 2015 | 3 | 3 | 0 |

**MassDEP Aesthetics Observations (2011-2018)** (MassDEP Undated 8)

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W0638 | Rocky Run | 2015 | Color | Light Yellow/Tan | 2 | 3 |
| W0638 | Rocky Run | 2015 | Color | None | 1 | 3 |
| W0638 | Rocky Run | 2015 | Objectionable Deposits | Not Applicable (N/A) | 3 | 3 |
| W0638 | Rocky Run | 2015 | Odor | None | 3 | 3 |
| W0638 | Rocky Run | 2015 | Scum | Not Applicable (N/A) | 3 | 3 |
| W0638 | Rocky Run | 2015 | Turbidity | Slightly Turbid | 3 | 3 |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |

*E. coli* & *Enterococcus* bacteria data were collected throughout this Rocky Run AU (MA53-16) at the following sampling stations (data years): MassDEP 5-7 times per year – at power lines crossing Davis Street (W0638) & north of the northern end of Meadowlark Drive, Rehoboth (W2920) (2015-2018) and at Plain St. (EPA_RR24); Martin St. (EPA_RR25), Pleasant Street (EPA_RR26), Davis St. (EPA_RR03) (once or twice a year 2012-2019 & ~monthly 2016-2019). The EPA *E. coli* data are too limited to assess the Use according to the CALM "Use Attainment Impairment Decision Schema, but the remaining data can be summarized as follows: EPA *Enterococcus* data collected in the downstream half of the AU at Davis St, Rehoboth (EPA_RR03) in 2016-2019, indicated 67-100 % of intervals had GMs >35 cfu/100ml in the 4 years and 2-4 samples each year exceeded the 130 cfu/100ml STV. MassDEP *E. coli* data collected also at Davis St (W0638) in 2015-2018, indicated 57-100% of intervals had GMs >126 cfu/100ml in 4 years, 2-3 samples each year exceeded the 410 cfu/100ml STV in 2 of the sample years & cumulatively 67 % of the GM intervals were >126 cfu/100ml. MassDEP *E. coli* data collected a little further downstream, north of Meadowlark Drive (W2920) in 2018, indicated 67% of intervals had GMs >126 cfu/100ml.
MassDEP conducted BST work in this AU in 2011-2015. In 2013/2014 a human source of bacteria was identified discharging from a pipe underneath Davis St into an unnamed tributary to Rocky Run. The source was subsequently removed by the Town of Rehoboth Board of Health. Additional BST work was conducted from 2016-2019 as part of the EPA/RIDEM/DEP joint effort in the Palmer River watershed (NWQI); *E. coli* counts ranged 10 to 15,531MPN/100ml and some potential agricultural sources were observed in the watershed. No additional correctable sources were found after 2014. Based on the *E. coli* and *Enterococcus* data described above, the Primary Contact Recreational Use for this Rocky Run AU (MA53-16) will continue to be assessed as Not Supporting. The existing impairments for *E. coli* and Fecal Coliform will be carried forwards. A new impairment will be added for *Enterococcus* based on the data collected by the EPA at Davis St (EPA_RR03).

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_RR03 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Davis Street, Rehoboth | 41.781562 | -71.250278 |
| EPA_RR24 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Plain Street, Rehoboth | 41.811416 | -71.230218 |
| EPA_RR25 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Martin Street, Rehoboth | 41.797461 | -71.239522 |
| EPA_RR26 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Pleasant Street, Rehoboth | 41.779463 | -71.239194 |
| W0638 | MassDEP | Water Quality | Rocky Run | [at power lines crossing Davis Street, Rehoboth. (just east of First Street)] | 41.781622 | -71.250434 |
| W2920 | MassDEP | Water Quality | Rocky Run | [north of the northern end of Meadowlark Drive, Rehoboth] | 41.784529 | -71.261392 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3) (MassDEP Undated 8) (MassDEP Undated 5)
[Result units are CFU/100ml or MPN/100ml]

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_RR03 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 212 | 212 | 212 |
| EPA_RR03 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 4 | 279 | 33 |
| EPA_RR03 | Environmental Protection Agency | E. coli | 04/19/16 | 04/19/16 | 1 | 39 | 39 | 39 |
| EPA_RR03 | Environmental Protection Agency | Enterococci | 04/19/16 | 10/12/16 | 7 | 10 | 775 | 121 |
| EPA_RR03 | Environmental Protection Agency | E. coli | 04/20/17 | 04/20/17 | 1 | 25 | 25 | 25 |
| EPA_RR03 | Environmental Protection Agency | Enterococci | 04/20/17 | 10/12/17 | 7 | 10 | 776 | 127 |
| EPA_RR03 | Environmental Protection Agency | Enterococci | 04/24/18 | 10/18/18 | 7 | 10 | 435 | 63 |
| EPA_RR03 | Environmental Protection Agency | Enterococci | 04/29/19 | 09/24/19 | 5 | 10 | 3255 | 132 |
| EPA_RR24 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 10 | 10 | 10 |
| EPA_RR24 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 30 | 108 | 57 |
| EPA_RR25 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 4 | 4 | 4 |
| EPA_RR25 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 44 | 64 | 53 |
| EPA_RR26 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 34 | 34 | 34 |
| EPA_RR26 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 70 | 129 | 95 |
| W0638 | MassDEP | E. coli | 07/07/15 | 09/08/15 | 3 | 91 | 548 | 205 |
| W0638 | MassDEP | E. coli | 05/17/16 | 10/12/16 | 6 | 52 | 980 | 205 |
| W0638 | MassDEP | E. coli | 05/31/17 | 10/12/17 | 6 | 20 | 602 | 84 |
| W0638 | MassDEP | E. coli | 04/24/18 | 10/18/18 | 7 | 19 | 816 | 136 |
| W2920 | MassDEP | E. coli | 04/24/18 | 10/18/18 | 7 | 15 | 816 | 169 |

## EPA_RR03 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 212 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

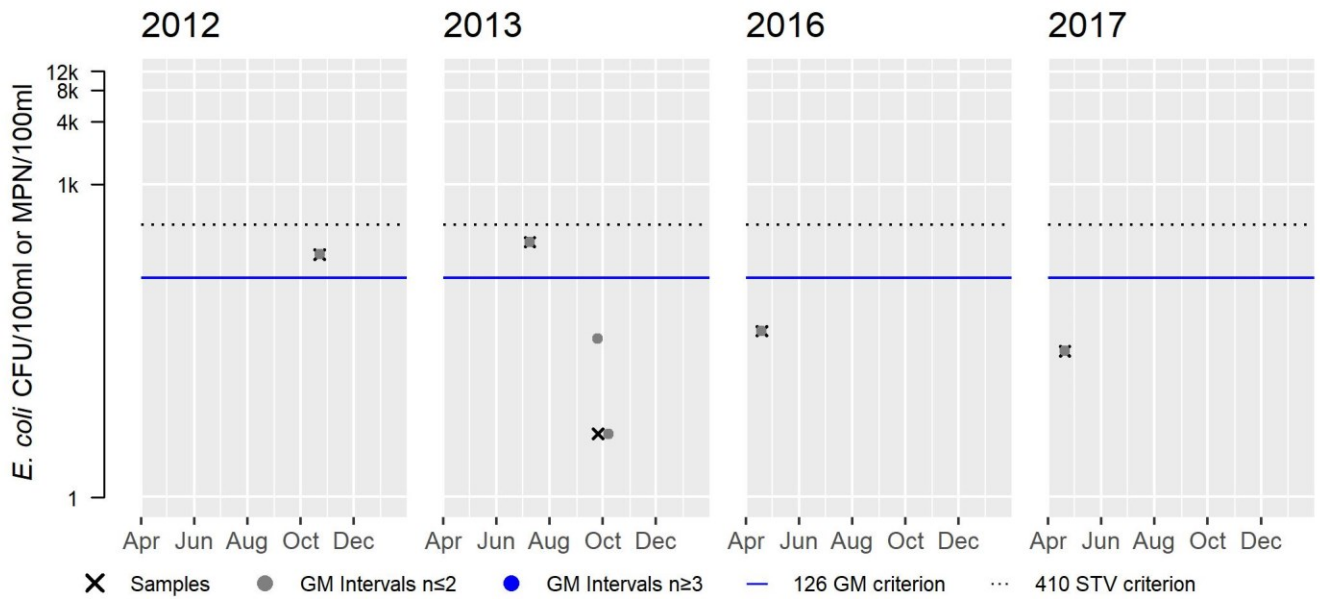
| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 33 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 39 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 25 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



## EPA_RR03 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 121 |
| #GMI | 6 |
| #GMI Ex | 6 |
| %GMI Ex | 100 |
| n>STV | 4 |
| %n>STV | 57 |

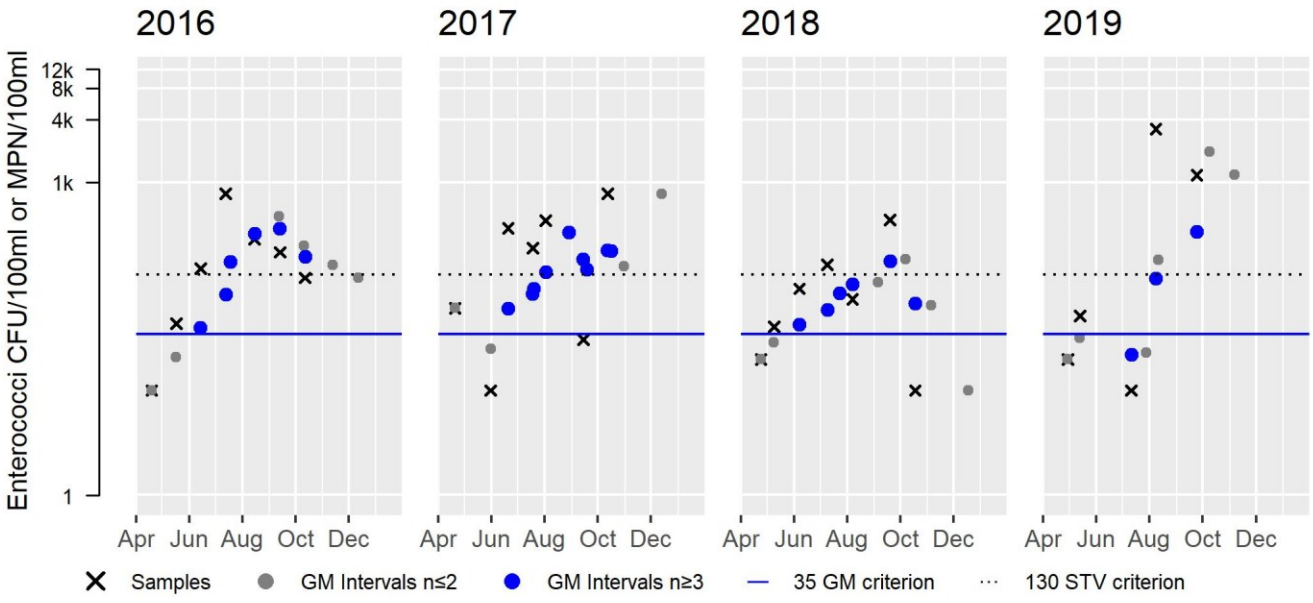
| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 127 |
| #GMI | 9 |
| #GMI Ex | 9 |
| %GMI Ex | 100 |
| n>STV | 4 |
| %n>STV | 57 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 63 |
| #GMI | 6 |
| #GMI Ex | 6 |
| %GMI Ex | 100 |
| n>STV | 2 |
| %n>STV | 29 |

| Var | Res |
|---|---|
| Samples | 5 |
| SeasGM | 132 |
| #GMI | 3 |
| #GMI Ex | 2 |
| %GMI Ex | 67 |
| n>STV | 2 |
| %n>STV | 40 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 96 |



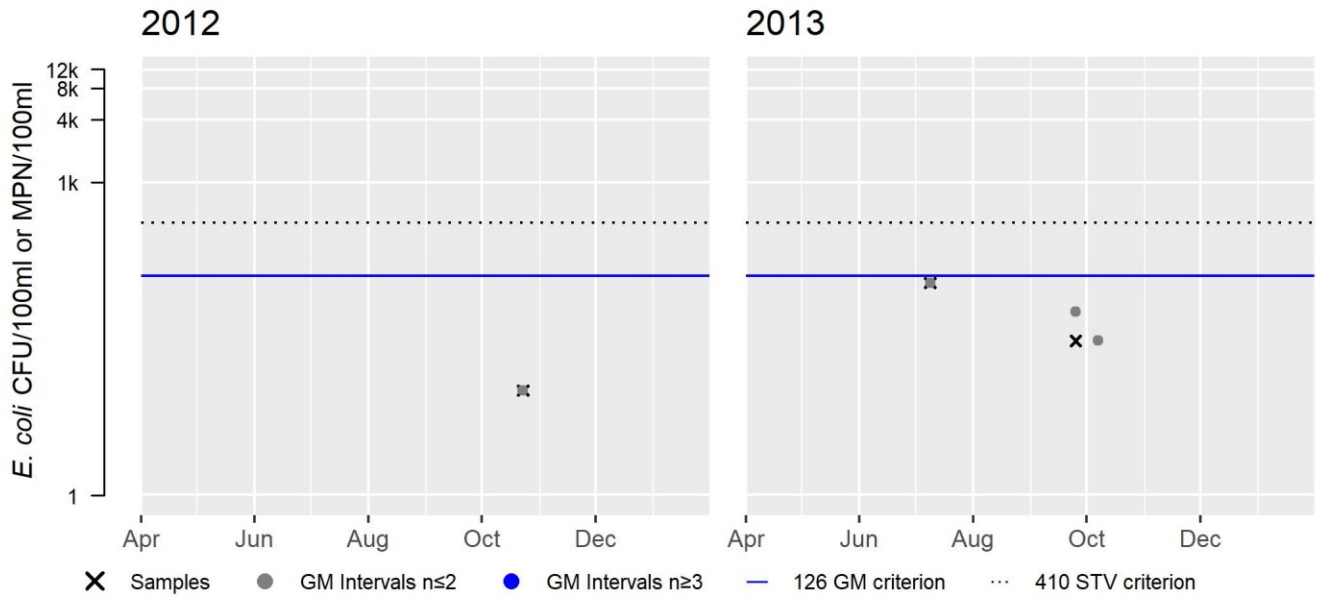
## EPA_RR24 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 10 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 57 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



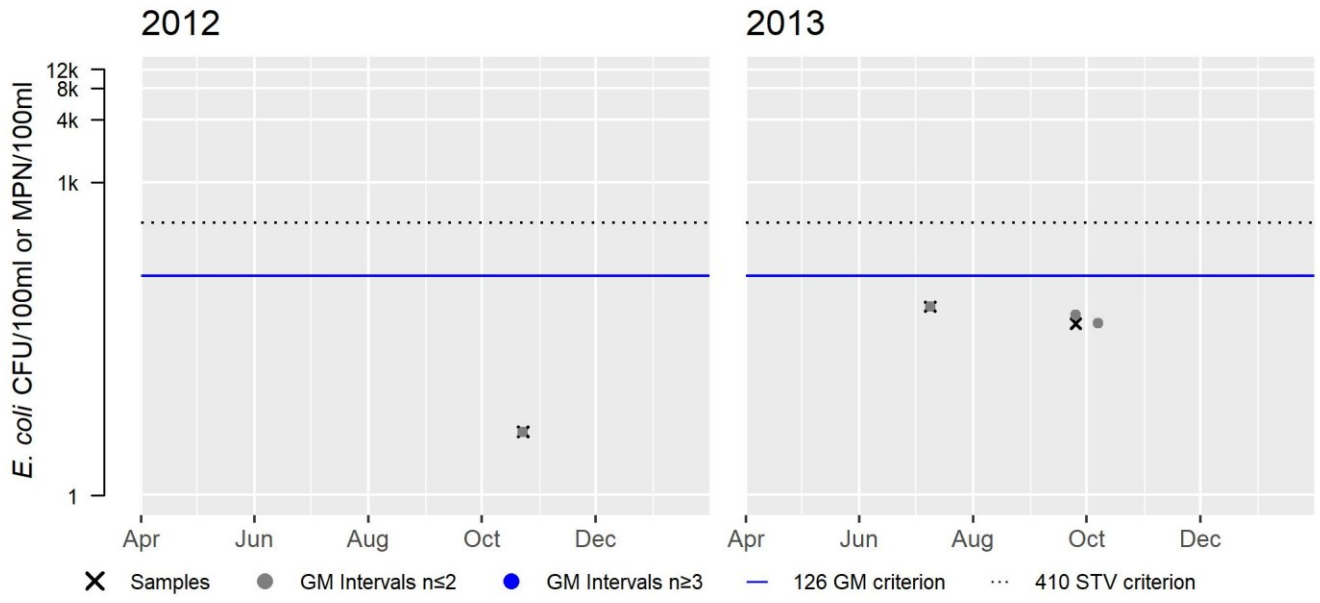
## EPA_RR25 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 4 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 53 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



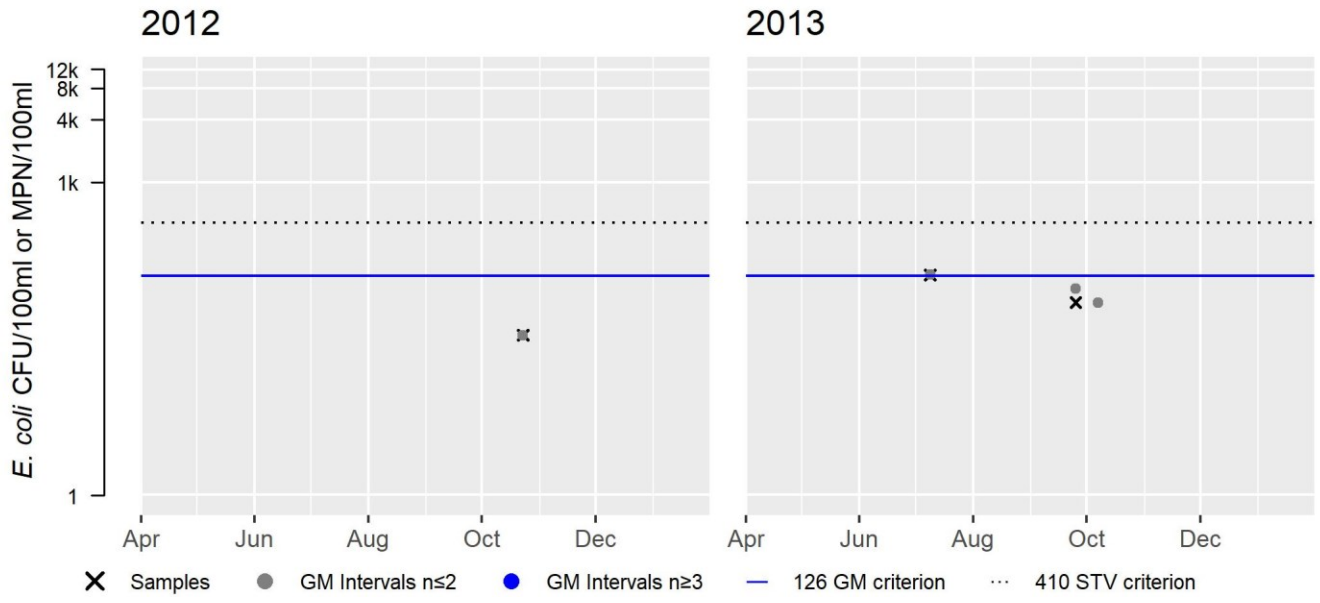
## EPA_RR26 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 34 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 95 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



## W0638 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 3 |
| SeasGM | 205 |
| #GMI | 1 |
| #GMI Ex | 1 |
| %GMI Ex | 100 |
| n>STV | 1 |
| %n>STV | 33 |

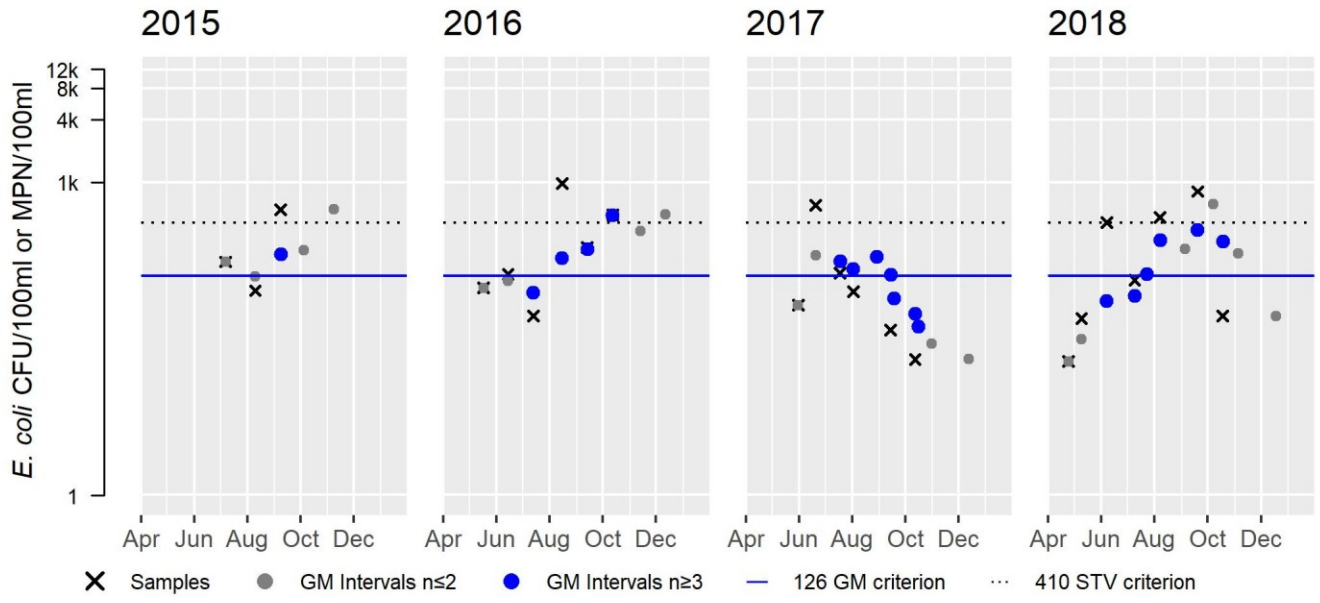
| Var | Res |
|---|---|
| Samples | 6 |
| SeasGM | 205 |
| #GMI | 4 |
| #GMI Ex | 3 |
| %GMI Ex | 75 |
| n>STV | 2 |
| %n>STV | 33 |

| Var | Res |
|---|---|
| Samples | 6 |
| SeasGM | 84 |
| #GMI | 7 |
| #GMI Ex | 4 |
| %GMI Ex | 57 |
| n>STV | 1 |
| %n>STV | 17 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 136 |
| #GMI | 6 |
| #GMI Ex | 4 |
| %GMI Ex | 67 |
| n>STV | 3 |
| %n>STV | 43 |

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

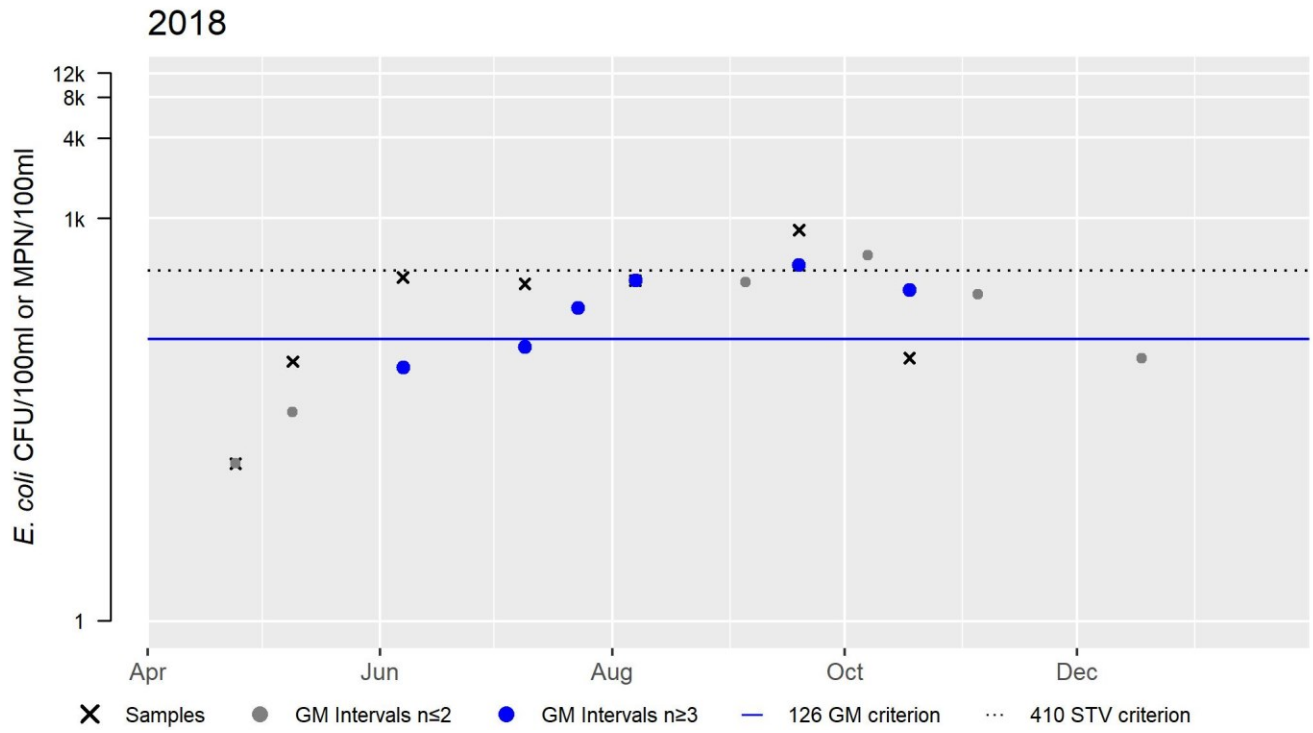
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 67 |



W2920 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 169 |
| #GMI | 6 |
| #GMI Ex | 4 |
| %GMI Ex | 67 |
| n>STV | 1 |
| %n>STV | 14 |

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




**MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019** (MassDEP Undated 1)

| **Summary** |
|---|
| Prior to 2011, BST work was conducted along the Rocky Run Brook AU (MA53-16) and on one unnamed tributary, with a max dry weather *E. coli* counts of 24,196MPN in the unnamed tributary downstream of Davis Street. Additional BST work was conducted in 2011-2015 at 2 sites along Rocky Run Brook with *E. coli* counts ranging 78 - >2,419.6MPN and 5 sites on the unnamed tributary with a max *E. coli* count of 241,960MPN. In 2013/2014 a human source of bacteria was identified discharging from a pipe underneath Davis Street into the unnamed tributary. The source was subsequently removed by the Town of Rehoboth Board of Health. Additional BST work was conducted along Rocky Run Brook from 2016-2019 as part of the EPA/RIDEM/DEP joint effort in the Palmer River watershed (NWQI); *E. coli* ranged 10 to 15,531MPN. No additional correctable sources were found after 2014. |

## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|

| Fully Supporting | NO |
|---|---|

**2022 Use Attainment Summary**

*E. coli* bacteria data were collected throughout this Rocky Run AU (MA53-16) at the following sampling stations (data years): MassDEP 5-7 times per year – W0638 & W2920 (2015-2018) and EPA 1-2 times per year – EPA_RR24, RR25, RR26 & RR03 (2012-2019). The EPA *E. coli* data are too limited to assess the Secondary Contact Recreational Use according to the CALM "Use Attainment Impairment Decision Schema, but the MassDEP data can be summarized as follows: *E. coli* data collected at Davis St (W0638) in 2015-2018 and north of Meadowlark Drive (W2920) in 2018, indicated 0% of intervals had GMs >630 cfu/100ml & no samples exceeded the 1260 cfu/100ml STV. Since the E. coli concentrations were below the use attainment impairment thresholds for these single and multi-year limited to moderate frequency datasets, the Secondary Contact Recreational Use for this Rocky Run AU (MA53-16) will continue to be assessed as Fully Supporting.

## *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_RR03 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Davis Street, Rehoboth | 41.781562 | -71.250278 |
| EPA_RR24 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Plain Street, Rehoboth | 41.811416 | -71.230218 |
| EPA_RR25 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Martin Street, Rehoboth | 41.797461 | -71.239522 |
| EPA_RR26 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Pleasant Street, Rehoboth | 41.779463 | -71.239194 |
| W0638 | MassDEP | Water Quality | Rocky Run | [at power lines crossing Davis Street, Rehoboth. (just east of First Street)] | 41.781622 | -71.250434 |
| W2920 | MassDEP | Water Quality | Rocky Run | [north of the northern end of Meadowlark Drive, Rehoboth] | 41.784529 | -71.261392 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3) (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_RR03 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 212 | 212 | 212 |
| EPA_RR03 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 4 | 279 | 33 |
| EPA_RR03 | Environmental Protection Agency | E. coli | 04/19/16 | 04/19/16 | 1 | 39 | 39 | 39 |
| EPA_RR03 | Environmental Protection Agency | E. coli | 04/20/17 | 04/20/17 | 1 | 25 | 25 | 25 |
| EPA_RR24 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 10 | 10 | 10 |

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_RR24 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 30 | 108 | 57 |
| EPA_RR25 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 4 | 4 | 4 |
| EPA_RR25 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 44 | 64 | 53 |
| EPA_RR26 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 34 | 34 | 34 |
| EPA_RR26 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 70 | 129 | 95 |
| W0638 | MassDEP | E. coli | 07/07/15 | 09/08/15 | 3 | 91 | 548 | 205 |
| W0638 | MassDEP | E. coli | 05/17/16 | 11/09/16 | 7 | 29 | 980 | 155 |
| W0638 | MassDEP | E. coli | 05/31/17 | 11/14/17 | 7 | 20 | 602 | 91 |
| W0638 | MassDEP | E. coli | 04/24/18 | 11/05/18 | 8 | 19 | 816 | 136 |
| W2920 | MassDEP | E. coli | 04/24/18 | 11/05/18 | 8 | 15 | 816 | 161 |

## EPA_RR03 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 212 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

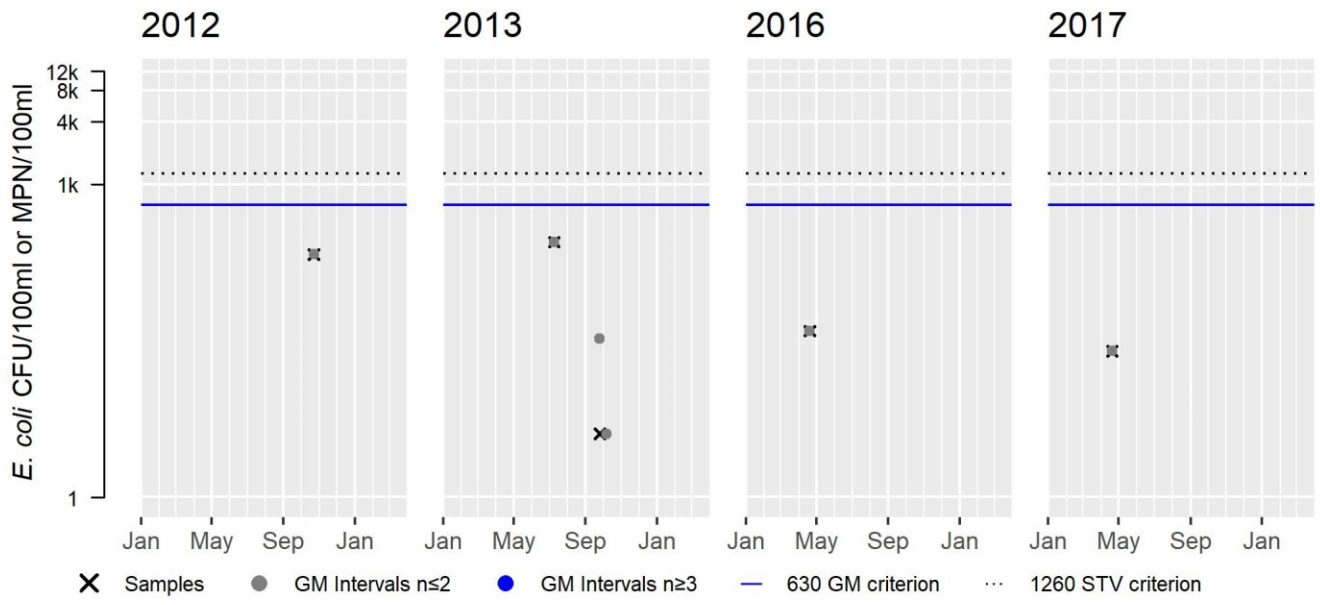
| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 33 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 39 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 25 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



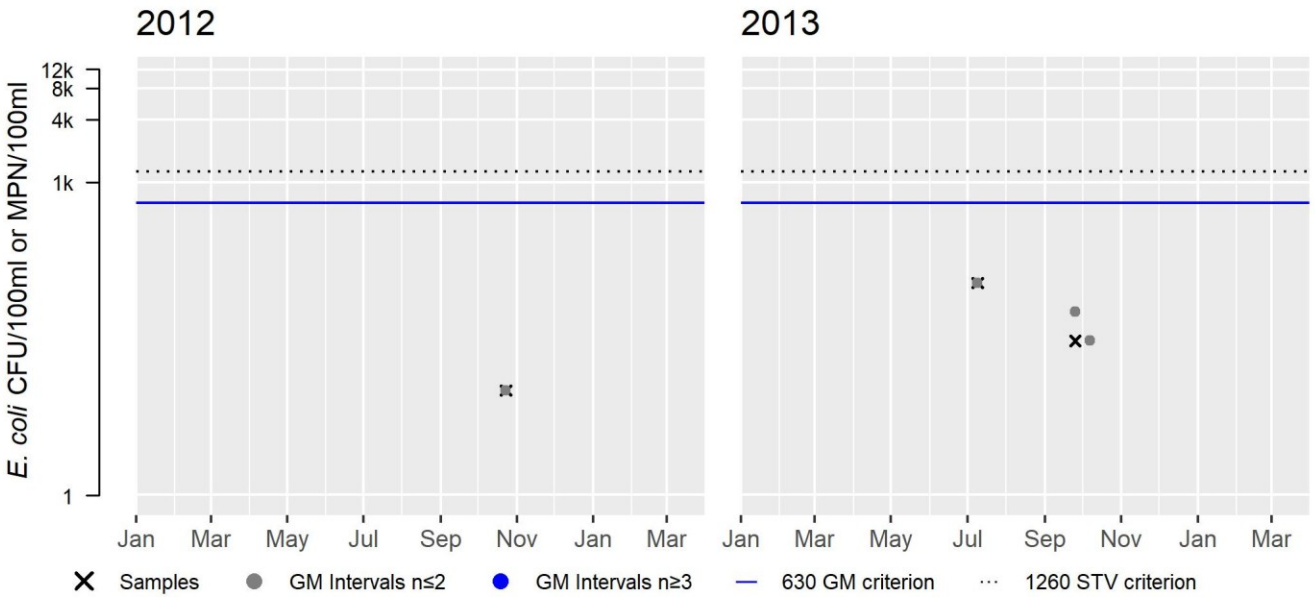
## EPA_RR24 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 10 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 57 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



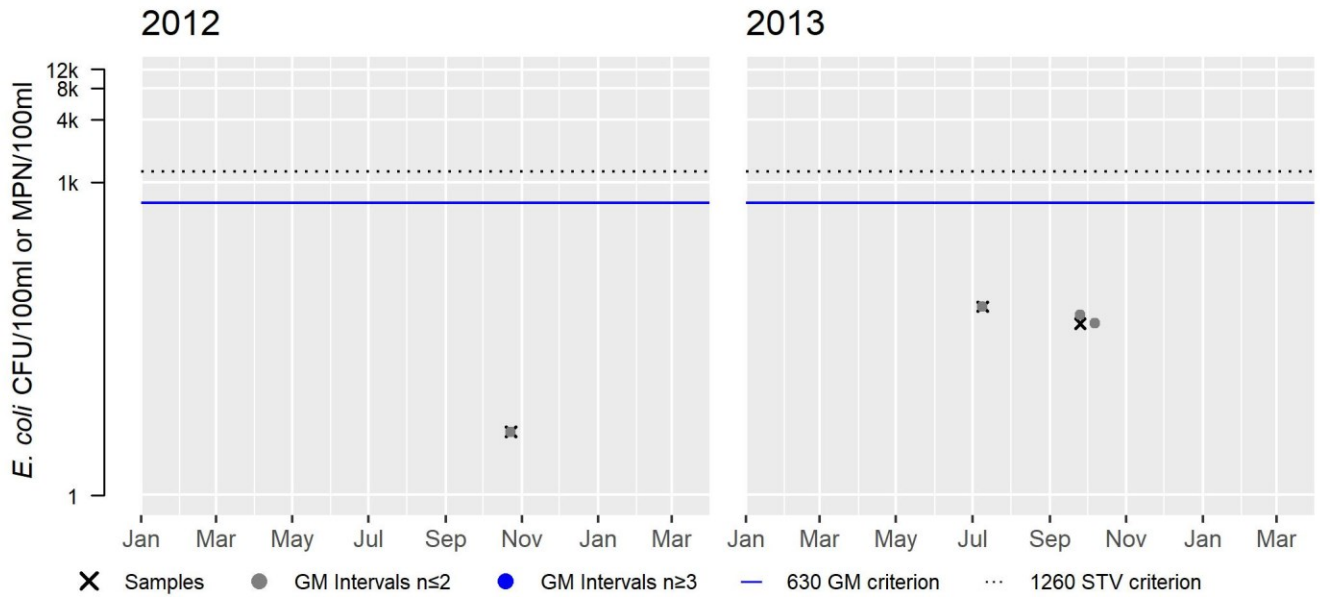
## EPA_RR25 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 4 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 53 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



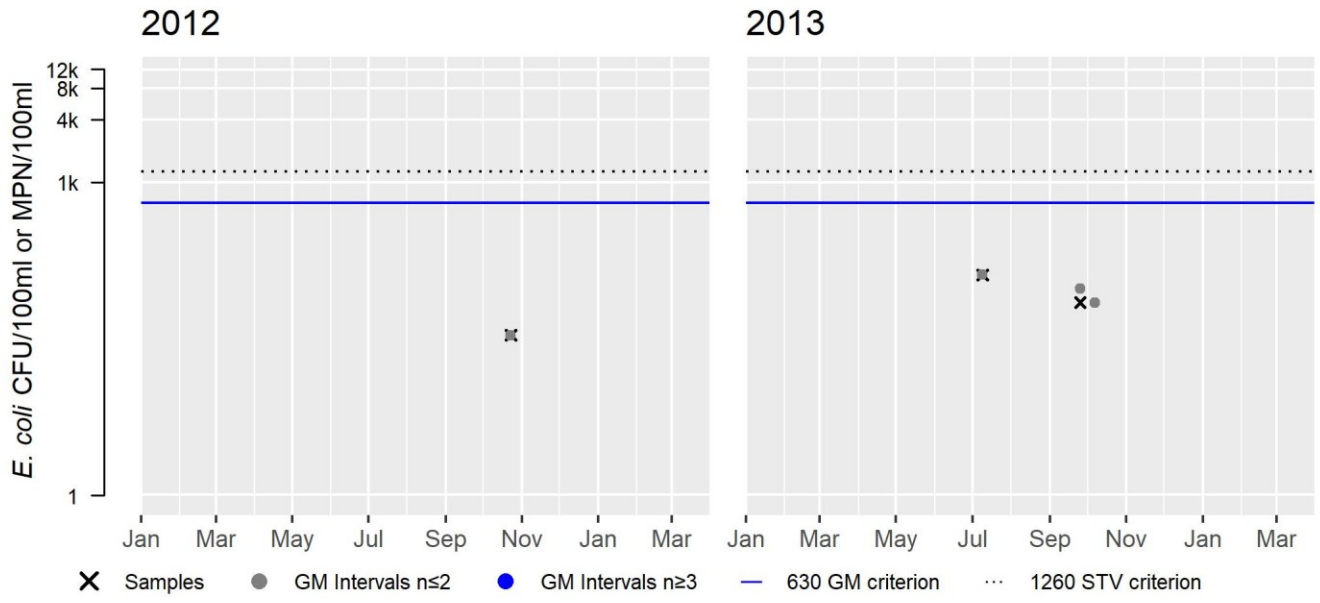
## EPA_RR26 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 34 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 95 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



## W0638 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 3 |
| SeasGM | 205 |
| #GMI | 1 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

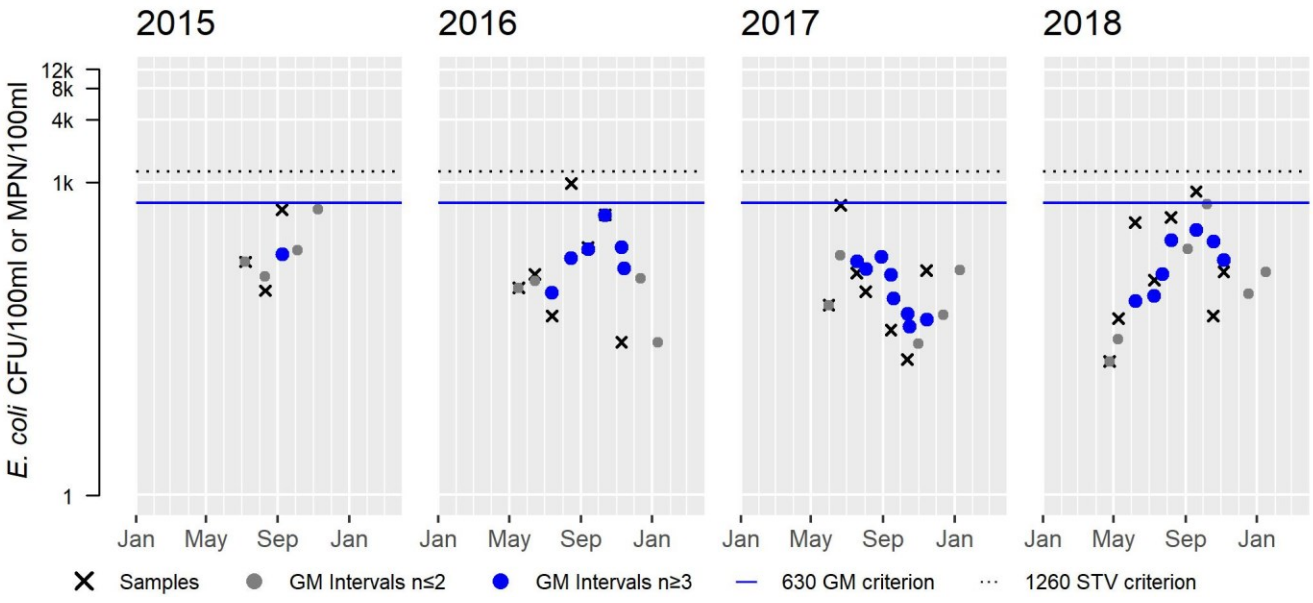
| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 155 |
| #GMI | 6 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 91 |
| #GMI | 8 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 136 |
| #GMI | 7 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

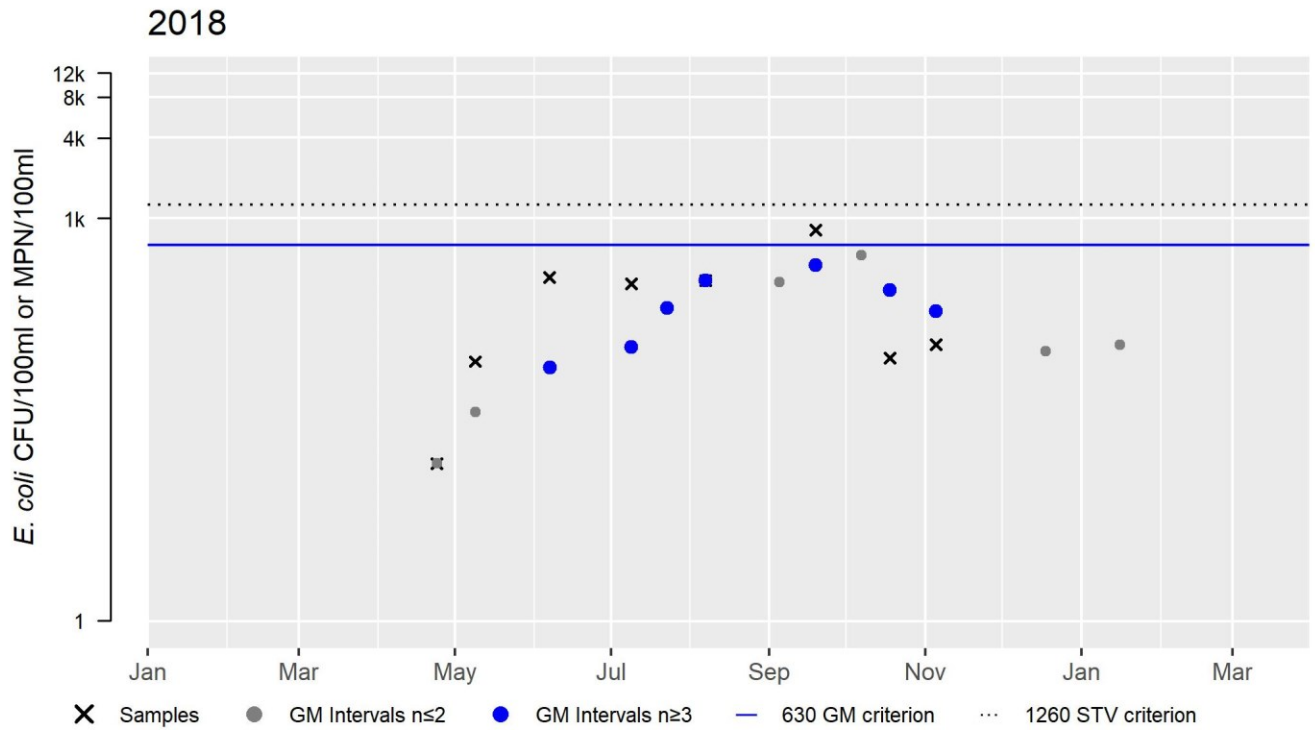
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



## W2920 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 161 |
| #GMI | 7 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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



# Rocky Run (MA53-18)

| | |
|---|---|
| **Location:** | approximately 0.1 mile east of Mason Street, Rehoboth to confluence with Palmer River, Rehoboth (formerly part of 2008 segment: Rocky Run MA53-16). |
| **AU Type:** | ESTUARY |
| **AU Size:** | 0.003 SQUARE MILES |
| **Classification/Qualifier:** | SA: SFO |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 4a | 5 | Enterococcus | | Added |
| 4a | 5 | Fecal Coliform | 35096 | Unchanged |

| Impairment | Source (Confirmed Y/N) | Fish, other Aquatic Life and Wildlife | Fish Consumption | Shellfish Harvesting | Aesthetic | Primary Contact Recreation | Secondary Contact Recreation |
|---|---|---|---|---|---|---|---|
| Enterococcus | Agriculture (Y) | | | | | X | X |
| Enterococcus | On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y) | | | | | X | X |
| Enterococcus | Source Unknown (N) | | | | | X | X |
| Fecal Coliform | Agriculture (Y) | | | X | | | |

## Recommendations

| 2022 Recommendations |
|---|
| ALU: Additional sampling for primary producers (chlorophyll a) is recommended, to clarify a possible nutrient enrichment problem for this estuarine portion of Rocky Run. |

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | YES |
| **2022 Use Attainment Summary** | |

EPA conducted discrete water quality monitoring in this Rocky Run AU (MA53-18) at Mason St., Rehoboth (EPA_RR01), once or twice in 2012-2013 and typically monthly in 2016-2019. The data were generally indicative of good water quality: the max temperature was 27.8°C (n=15), with a minimum DO of 5.4mg/L (n=3) and a pH range of 6.3-7.6SU (n=3), twice measuring <6.5SU. There was no indication of nutrient enrichment: seasonal average total phosphorus ranged 0.045-0.068mg/L (5-day averages n=20); with a max DO saturation of 95.9% & no observations of dense/very dense filamentous algae (n=1). The seasonal average total nitrogen concentrations ranged from 0.8 to 0.9mg/L (n= 5 samples each year 2016 to 2019). According to CALM guidance (MassDEP 2022), total nitrogen >0.5mg/L can be indicative of moderately-severely degraded health for the system. However, there are no primary producer data to clarify the existence of a nutrient enrichment problem for this AU. Total ammonia nitrogen ranged 0.07-0.22mg/L (n=8), but its potential toxicity could not be properly calculated due to a lack of date specific pH and salinity data. The Aquatic Life Use for Rocky Run (MA53-18) is assessed as Fully Supporting based on the EPA water quality data. An Alert will be issued due to the elevated total nitrogen concentrations observed at Mason St.

## *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W0640 | MassDEP | Water Quality | Rocky Run | [Mason Street, Rehoboth] | 41.782492 | -71.274457 |

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_RR01 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Mason Street, Rehoboth | 41.782417 | -71.274411 |

## *Biological Monitoring Information*

### Habitat and Flow Data (anthropogenic alterations)

**EPA Discrete Total Suspended Solids Data (2016-2019).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | TSS Count | TSS Max (mg/L) | TSS Avg (mg/L) | TSS Count >25 |
|---|---|---|---|---|---|---|
| EPA_RR01 | 04/19/16 | 11/09/16 | 8 | 51 | 9.9 | 1 |
| EPA_RR01 | 04/20/17 | 11/14/17 | 8 | 5.5 | 3.1 | 0 |
| EPA_RR01 | 04/24/18 | 11/05/18 | 8 | 6.5 | 3.5 | 0 |
| EPA_RR01 | 05/13/19 | 11/06/19 | 7 | 6.7 | 4.6 | 0 |

## *Physico-chemical Water Quality Information*

### DO, pH, Temperature

**EPA Estuarine Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | % Meas. <5.0 | % Meas. <4.0 |
|---|---|---|---|---|---|---|---|
| EPA_RR01 | 10/23/12 | 10/23/12 | 1 | 7.3 | 7.3 | 0 | 0 |
| EPA_RR01 | 07/09/13 | 09/25/13 | 2 | 5.4 | 7.7 | 0 | 0 |

**EPA Estuarine Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer Index is June 1 – Sept 15]

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count >29.4 |
|---|---|---|---|---|---|---|---|
| EPA_RR01 | 10/23/12 | 10/23/12 | 1 | 0 | 11.0 | 11.0 | 0 |
| EPA_RR01 | 07/09/13 | 09/25/13 | 2 | 1 | 25.4 | 19.4 | 0 |
| EPA_RR01 | 04/19/16 | 11/09/16 | 8 | 4 | 27.8 | 16.1 | 0 |
| EPA_RR01 | 04/20/17 | 11/14/17 | 8 | 4 | 22.1 | 16.4 | 0 |
| EPA_RR01 | 04/24/18 | 11/05/18 | 8 | 3 | 26.4 | 15.7 | 0 |
| EPA_RR01 | 04/29/19 | 11/06/19 | 8 | 3 | 23.0 | 15.5 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_RR01 | 10/23/12 | 10/23/12 | 1 | 6.3 | 6.3 | 1 | 0 |
| EPA_RR01 | 07/09/13 | 09/25/13 | 2 | 6.3 | 7.6 | 1 | 0 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**MassDEP Nutrient Enrichment Indicator Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | Delta DO Max (mg/L) | Delta DO Avg (mg/L) | DO Sat Max (%) | pH Max (SU) | Count Algal Obsv. | Dense/V. Dense Film/Fila. Algae |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W0640 | 2014 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |

**EPA Summer Seasonal Total Nitrogen Data (2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Total nitrogen data collected May-Sept]

| Station Code | Start Date | End Date | Seasonal TN Count | Seasonal TN Min (mg/L) | Seasonal TN Max (mg/L) | Seasonal TN Avg (mg/L) |
|---|---|---|---|---|---|---|
| EPA_RR01 | 05/17/16 | 09/13/16 | 5 | 0.6 | 1.0 | 0.8 |
| EPA_RR01 | 05/31/17 | 09/14/17 | 5 | 0.5 | 1.4 | 0.9 |
| EPA_RR01 | 05/09/18 | 09/19/18 | 5 | 0.6 | 1.0 | 0.8 |
| EPA_RR01 | 05/13/19 | 09/24/19 | 5 | 0.5 | 1.0 | 0.8 |

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

**EPA Estuarine Total Ammonia Nitrogen (TAN) Data (2017 & 2019).** (EPA 2020) (MassDEP Undated 3)
[TAN= $NH3 + NH_4^+$]

| Station Code | Start Date | End Date | TAN Count | TAN Min (mg/L) | TAN Max (mg/L) | TAN Avg (mg/L) |
|---|---|---|---|---|---|---|
| EPA_RR01 | 11/14/17 | 11/14/17 | 1 | 0.22 | 0.22 | 0.22 |
| EPA_RR01 | 04/29/19 | 11/06/19 | 7 | 0.07 | 0.17 | 0.09 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH; therefore, the Fish Consumption Use for this Rocky Run AU (MA53-18) is Not Assessed. | |

## Shellfish Harvesting

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | YES |
| **2022 Use Attainment Summary** | |
| Rocky Run (MA53-18): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0017 sq mi (62%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0017 sq mi (62%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area >= 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment, so the Shellfish Harvesting Use is evaluated as not supporting. | |

### *Shellfish Growing Area Classifications*

**MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

| Area Name | Waterbody/Area Description | Classification | Area (Sq. Mi.) | Area (% of AU) |
|---|---|---|---|---|
| MHB5.0 | Palmer River | Prohibited | 0.00174 | 62.5% |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | NO |
| **2022 Use Attainment Summary** | |
| MassDEP staff surveyed this Rocky Run AU (MA53-18) at Mason Street, Rehoboth (W0640) once during the summer of 2014 and again during the summer 2015 (n=3). There were generally no objectionable conditions (i.e., odors, deposits, growths, or turbidity) observed during the surveys. The Aesthetics Use for this Rocky Run AU (MA53-18) is assessed as Fully Supporting. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W0640 | MassDEP | Water Quality | Rocky Run | [Mason Street, Rehoboth] | 41.782492 | -71.274457 |

### *Aesthetic Observations*

**Aesthetics Summary Statements for MassDEP Stations (2011-2018)** (MassDEP Undated 5)

| Station Code | Waterbody | Data Year | Field Sheet Count | Aesthetics Summary Statement |
|---|---|---|---|---|
| W0640 | Rocky Run | 2014 | 1 | MassDEP aesthetics observations for station W0640 on Rocky Run can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2014. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=1). |
| W0640 | Rocky Run | 2015 | 3 | MassDEP aesthetics observations for station W0640 on Rocky Run can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2015. |

**Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018)** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Field Sheet Count | Field Sheet Count w/ Film & Filamentous Algae Observations | Dense/ Very Dense Film/ Filamentous Algae |
|---|---|---|---|---|
| W0640 | 2014 | 1 | 1 | 0 |
| W0640 | 2015 | 3 | 0 | 0 |

**MassDEP Aesthetics Observations (2011-2018)** (MassDEP Undated 8)

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W0640 | Rocky Run | 2014 | Color | Light Yellow/Tan | 1 | 1 |
| W0640 | Rocky Run | 2014 | Objectionable Deposits | Not Applicable (N/A) | 1 | 1 |
| W0640 | Rocky Run | 2014 | Odor | None | 1 | 1 |
| W0640 | Rocky Run | 2014 | Scum | Not Applicable (N/A) | 1 | 1 |
| W0640 | Rocky Run | 2014 | Turbidity | Highly Turbid | 1 | 1 |
| W0640 | Rocky Run | 2015 | Color | Light Yellow/Tan | 2 | 3 |
| W0640 | Rocky Run | 2015 | Color | None | 1 | 3 |
| W0640 | Rocky Run | 2015 | Objectionable Deposits | Not Applicable (N/A) | 3 | 3 |
| W0640 | Rocky Run | 2015 | Odor | None | 3 | 3 |
| W0640 | Rocky Run | 2015 | Scum | Not Applicable (N/A) | 3 | 3 |
| W0640 | Rocky Run | 2015 | Turbidity | Highly Turbid | 1 | 3 |
| W0640 | Rocky Run | 2015 | Turbidity | Moderately Turbid | 1 | 3 |
| W0640 | Rocky Run | 2015 | Turbidity | Slightly Turbid | 1 | 3 |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |
| *Enterococcus* bacteria samples were collected by EPA staff in this Rocky Run AU (MA53-18) at Mason St. Rehoboth (EPA_RR01) once or twice a year 2013-2015 and then 7 times per year in 2016-2019. Analysis of the 2016-19 data indicated 100% of intervals had GMs >35 cfu/100ml in the 4 years and 3-5 samples in each of those 4 years exceeded the 130 cfu/100ml STV. The Primary Contact Recreational Use for this Rocky Run AU (MA53-18) is assessed as Not Supporting because of elevated *Enterococcus* bacteria which is being added as an impairment. | |

## *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_RR01 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Mason Street, Rehoboth | 41.782417 | -71.274411 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_RR01 | Environmental Protection Agency | Enterococci | 09/25/13 | 09/25/13 | 1 | 134 | 134 | 134 |
| EPA_RR01 | Environmental Protection Agency | Enterococci | 06/20/14 | 06/20/14 | 1 | 727 | 727 | 727 |
| EPA_RR01 | Environmental Protection Agency | Enterococci | 07/09/15 | 09/09/15 | 2 | 1010 | 8160 | 2871 |
| EPA_RR01 | Environmental Protection Agency | Enterococci | 04/19/16 | 10/12/16 | 7 | 10 | 689 | 176 |
| EPA_RR01 | Environmental Protection Agency | Enterococci | 04/20/17 | 10/12/17 | 7 | 10 | 1106 | 216 |
| EPA_RR01 | Environmental Protection Agency | Enterococci | 04/24/18 | 10/18/18 | 7 | 20 | 1014 | 106 |
| EPA_RR01 | Environmental Protection Agency | Enterococci | 04/29/19 | 10/22/19 | 7 | 41 | 4664 | 272 |

EPA_RR01 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 134 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 727 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 2871 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 2 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 176 |
| #GMI | 6 |
| #GMI Ex | 6 |
| %GMI Ex | 100 |
| n>STV | 5 |
| %n>STV | 71 |

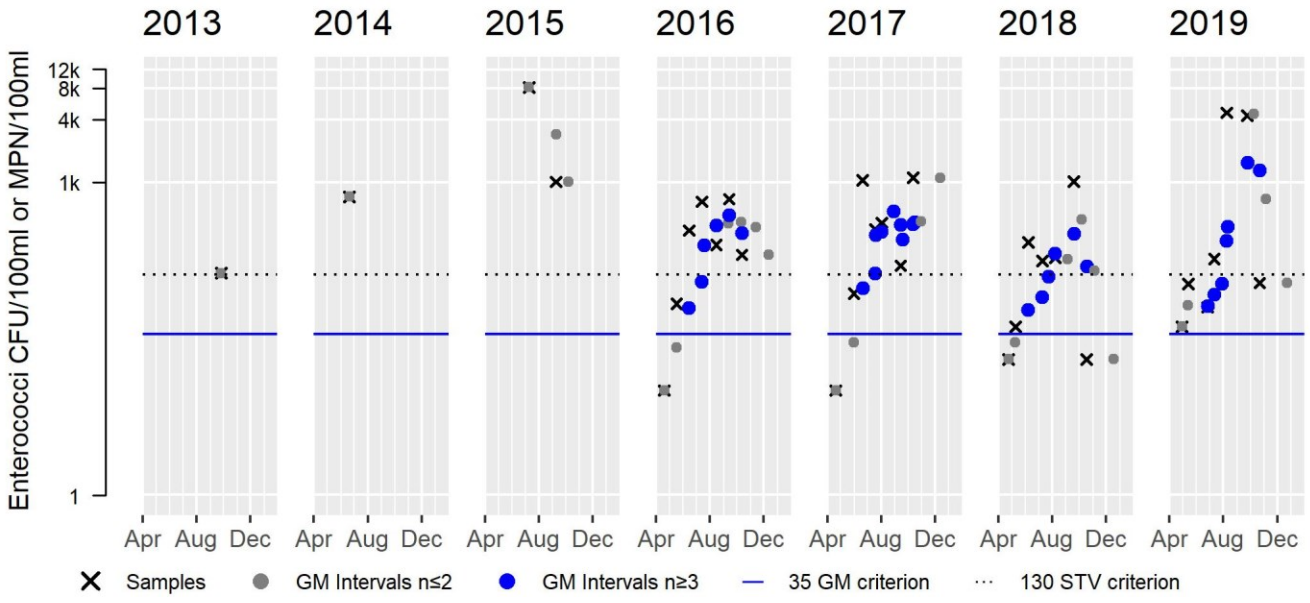
| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 216 |
| #GMI | 9 |
| #GMI Ex | 9 |
| %GMI Ex | 100 |
| n>STV | 5 |
| %n>STV | 71 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 106 |
| #GMI | 6 |
| #GMI Ex | 6 |
| %GMI Ex | 100 |
| n>STV | 4 |
| %n>STV | 57 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 272 |
| #GMI | 7 |
| #GMI Ex | 7 |
| %GMI Ex | 100 |
| n>STV | 3 |
| %n>STV | 43 |

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

| *Variable* | Cumulative %GMI Ex (all years) | Cumulative %GMI Ex (last 5 years) |
|---|---|---|
| *Result* | 100 | 100 |




## *Shellfish Growing Area Classifications*

**MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

| **Summary** |
|---|
| Rocky Run (MA53-18): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0017 sq mi (62%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data. |

## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|
| Not Supporting | NO |

| **2022 Use Attainment Summary** |
|---|
| *Enterococcus* bacteria data was collected in this Rocky Run AU (MA53-18) at Mason St. Rehoboth (EPA_RR01) once or twice a year 2013-2015 and then 7 times per year in 2016-2019. Analysis of the 2016-19 data indicated 29-75% of intervals had GMs >175 cfu/100ml in the 4 years and 2-3 samples in 3 of those years exceeded the 350 cfu/100ml STV. The Secondary Contact Recreational Use for this Rocky Run AU (MA53-18) is assessed as Not Supporting because of elevated Enterococcus bacteria which is being added as an impairment. |

## *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_RR01 | Environmental Protection Agency | Water Quality | Rocky Run | Rocky Run @ Mason Street, Rehoboth | 41.782417 | -71.274411 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_RR01 | Environmental Protection Agency | Enterococci | 09/25/13 | 09/25/13 | 1 | 134 | 134 | 134 |
| EPA_RR01 | Environmental Protection Agency | Enterococci | 06/20/14 | 06/20/14 | 1 | 727 | 727 | 727 |
| EPA_RR01 | Environmental Protection Agency | Enterococci | 07/09/15 | 09/09/15 | 2 | 1010 | 8160 | 2871 |
| EPA_RR01 | Environmental Protection Agency | Enterococci | 04/19/16 | 11/09/16 | 8 | 10 | 689 | 155 |
| EPA_RR01 | Environmental Protection Agency | Enterococci | 04/20/17 | 11/14/17 | 8 | 10 | 1106 | 206 |
| EPA_RR01 | Environmental Protection Agency | Enterococci | 04/24/18 | 11/05/18 | 8 | 20 | 1014 | 97 |
| EPA_RR01 | Environmental Protection Agency | Enterococci | 04/29/19 | 11/06/19 | 8 | 41 | 4664 | 268 |

EPA_RR01 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 134 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 727 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 2871 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 2 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 155 |
| #GMI | 8 |
| #GMI Ex | 6 |
| %GMI Ex | 75 |
| n>STV | 2 |
| %n>STV | 25 |

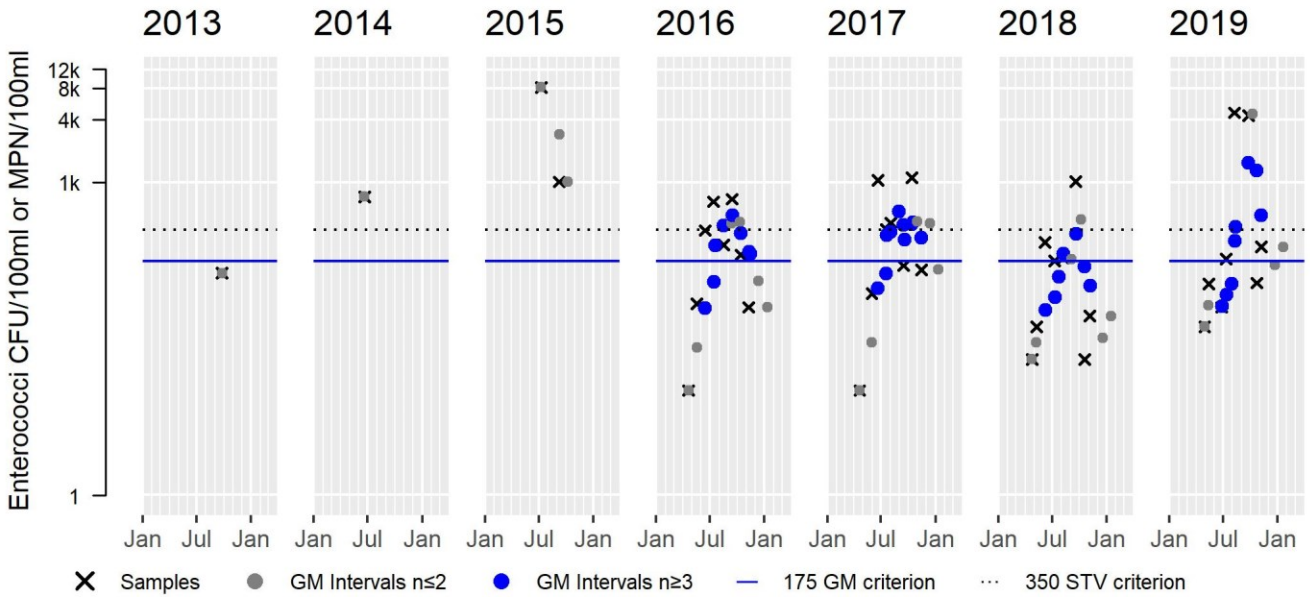
| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 206 |
| #GMI | 10 |
| #GMI Ex | 8 |
| %GMI Ex | 80 |
| n>STV | 3 |
| %n>STV | 38 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 97 |
| #GMI | 7 |
| #GMI Ex | 2 |
| %GMI Ex | 29 |
| n>STV | 1 |
| %n>STV | 12 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 268 |
| #GMI | 8 |
| #GMI Ex | 5 |
| %GMI Ex | 62 |
| n>STV | 2 |
| %n>STV | 25 |

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

| *Variable* | Cumulative %GMI Ex (all years) | Cumulative %GMI Ex (last 5 years) |
|---|---|---|
| *Result* | 64 | 64 |




## *Shellfish Growing Area Classifications*

**MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

| **Summary** |
|---|
| Rocky Run (MA53-18): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0017 sq mi (62%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data. |

# Rumney Marsh Brook (MA53-09)

| | |
|---|---|
| **Location:** | Headwaters, east of Locust Avenue, Rehoboth to confluence with Beaverdam Brook, Rehoboth. |
| **AU Type:** | RIVER |
| **AU Size:** | 1.3 MILES |
| **Classification/Qualifier:** | B |

No usable data were available for Rumney Marsh Brook (MA53-09) for the 2022 Integrated Reporting cycle, therefore its category, use attainments, impairments, associated actions, and sources remain unchanged from the previous cycle.

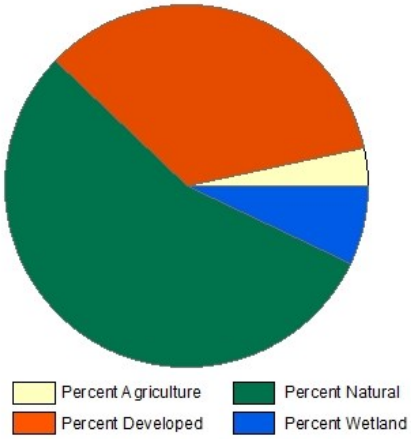
| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 3 | 3 | None | | Unchanged |

# Runnins River (MA53-01)

| | |
|---|---|
| **Location:** | Route 44, Seekonk to Mobile Dam, Seekonk, MA/East Providence, RI (through former 2008 segment: Burrs Pond MA53001). |
| **AU Type:** | RIVER |
| **AU Size:** | 3.7 MILES |
| **Classification/Qualifier:** | B |

**Runnins River - MA53-01**

Watershed Area: 7.45 square miles




| Landuse Type | Entire Basin | 5km Radius Proximal Subbasin | 100m Stream Buffer | Proximal Stream Buffer |
|---|---|---|---|---|
| Land Use Area (square miles) | 7.45 | 3.51 | 1.89 | 0.85 |
| Agriculture | 3.4% | 1.3% | 3.3% | 1.5% |
| Developed | 34.4% | 49.6% | 21.6% | 35.6% |
| Natural | 55.2% | 45.5% | 61.4% | 52.9% |
| Wetland | 7% | 3.6% | 13.6% | 10% |
| Impervious Cover | 17.3% | | | |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 5 | 5 | (Fish Passage Barrier*) | | Added |
| 5 | 5 | Benthic Macroinvertebrates | | Unchanged |
| 5 | 5 | Dissolved Oxygen | | Unchanged |
| 5 | 5 | Escherichia Coli (E. Coli) | 38903 | Unchanged |
| 5 | 5 | Fecal Coliform | 38903 | Unchanged |
| 5 | 5 | Mercury in Fish Tissue | 33880 | Unchanged |
| 5 | 5 | Nutrient/Eutrophication Biological Indicators | | Unchanged |

| Impairment | Source (Confirmed Y/N) | Fish, other Aquatic Life and Wildlife | Fish Consumption | Aesthetic | Primary Contact Recreation | Secondary Contact Recreation |
|---|---|---|---|---|---|---|
| (Fish Passage Barrier*) | Dam or Impoundment (Y) | X | | | | |
| Benthic Macroinvertebrates | Source Unknown (N) | X | | | | |
| Dissolved Oxygen | Discharges from Municipal Separate Storm Sewer Systems (MS4) (N) | X | | | | |
| Dissolved Oxygen | Source Unknown (N) | X | | | | |

| Impairment | Source (Confirmed Y/N) | Fish, other Aquatic Life and Wildlife | Fish Consumption | Aesthetic | Primary Contact Recreation | Secondary Contact Recreation |
|---|---|---|---|---|---|---|
| Escherichia Coli (E. Coli) | Agriculture (Y) | | | | X | X |
| Escherichia Coli (E. Coli) | Discharges from Municipal Separate Storm Sewer Systems (MS4) (N) | | | | X | X |
| Escherichia Coli (E. Coli) | On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y) | | | | X | X |
| Fecal Coliform | Agriculture (Y) | | | | X | X |
| Fecal Coliform | Discharges from Municipal Separate Storm Sewer Systems (MS4) (N) | | | | X | X |
| Fecal Coliform | On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) (Y) | | | | X | X |
| Mercury in Fish Tissue | Atmospheric Deposition - Toxics (Y) | | X | | | |
| Mercury in Fish Tissue | Source Unknown (N) | | X | | | |
| Nutrient/Eutrophication Biological Indicators | Discharges from Municipal Separate Storm Sewer Systems (MS4) (N) | X | | | | |
| Nutrient/Eutrophication Biological Indicators | Source Unknown (N) | X | | | | |

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |

**2022 Use Attainment Summary**

DMF biologists note three structures causing passage limitation to diadromous fish in the lower half of this Runnins River AU (MA53-01). From upstream to downstream: the Old Grist Mill Pond Dam (NATID# MA02218) located just upstream of Mill Road; the Burr Pond Dam (NATID# MA02473) located upstream of Leonard Street and the Mobile Dam (ID# unknown) located right at the downstream end of the AU (all three in Seekonk), were all given passage scores of "10" on a 0-10 scale, indicating that all three dams allow no possible passage of the targeted fish species, river herring and American eel. The population score was noted to be "1" in the area of all three structures. No other recent monitoring data (biological or physico-chemical) were collected.

The Aquatic Life Use for this Runnins River AU (MA53-01) will continue to be assessed as Not Supporting with the Benthic Macroinvertebrates, Dissolved Oxygen, and Nutrient Eutrophication Biological Indicators impairments being carried forward. A Fish Passage Barrier impairment is being added based on the barrier to diadromous fish passage at the three dams mentioned above so the former alert is being removed.

#### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W0651 | MassDEP | Water Quality | Runnins River | [School Street, Seekonk] | 41.788377 | -71.329520 |
| W2427 | MassDEP | Water Quality | Runnins River | [Mink Street, Seekonk] | 41.789748 | -71.331999 |

## *Biological Monitoring Information*

### Habitat and Flow Data (anthropogenic alterations)

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

| Assessment Summary |
|---|
| DMF biologists note three structures causing passage limitation to diadromous fish in the lower half of this Runnins River AU. From upstream to downstream: the Old Grist Mill Pond Dam (NATID# MA02218) located just upstream of Mill Road; the Burr Pond Dam (NATID# MA02473) located upstream of Leonard Street and the Mobile Dam (ID# unknown) located right at the bottom of the AU (all three in Seekonk), were all given passage scores of "10" on a 0-10 scale, indicating that all three dams allow no possible passage of the targeted fish species, river herring and American eel. The population score was noted to be "1" in the area of all three structures. The Aquatic Life Use for Runnins River (Assessment Unit MA53-01) is assessed as Not Supporting, based on the barrier to diadromous fish passage at the three dams mentioned above. |

## *Physico-chemical Water Quality Information*

### Nutrients (Primary Producer Screening, Physico-chemical Screening)

**MassDEP Nutrient Enrichment Indicator Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | Delta DO Max (mg/L) | Delta DO Avg (mg/L) | DO Sat Max (%) | pH Max (SU) | Count Algal Obsv. | Dense/V. Dense Film/Fila. Algae |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W0651 | 2013 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |
| W2427 | 2013 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |

### Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |
| Because of the site-specific fish consumption advisory for the Burrs Pond impoundment of this Runnins River AU (MA53-01) due to mercury contamination, the Fish Consumption Use will continue to be assessed as Not Supporting with the Mercury in Fish Tissue impairment being carried forward. | |

As previously reported (MassDEP 2009), fish were collected from the Burrs Pond impoundment of this Runnins River AU (MA53-01) in 1999 and the edible fillets were analyzed for metals (As, Cd, Hg, Pb, Se), PCBs, and organochlorine pesticides (Maietta 2007). Due to the presence of elevated mercury in largemouth bass, MA DPH issued the following advisory recommending:

- "Children under 12 years of age, pregnant women, nursing mothers, and women of childbearing age who may become pregnant should refrain from consuming largemouth bass from Burrs Pond" and
- "The general public should limit consumption of largemouth bass to two meals per month."

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | NO |

**2022 Use Attainment Summary**

MassDEP staff recorded three sets of observations at two sites along this Runnins River AU (MA53-01) in Seekonk, during the summer of 2013: Mink Street (W2427) and School Street (W0651). There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DWM-WPP field sampling crews at either of these stations (n=3 in both cases). The Aesthetics Use for this Runnins River AU (MA53-01) is assessed as Fully Supporting.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W0651 | MassDEP | Water Quality | Runnins River | [School Street, Seekonk] | 41.788377 | -71.329520 |
| W2427 | MassDEP | Water Quality | Runnins River | [Mink Street, Seekonk] | 41.789748 | -71.331999 |

### *Aesthetic Observations*

**Aesthetics Summary Statements for MassDEP Stations (2011-2018)** (MassDEP Undated 5)

| Station Code | Waterbody | Data Year | Field Sheet Count | Aesthetics Summary Statement |
|---|---|---|---|---|
| W0651 | Runnins River | 2013 | 3 | MassDEP aesthetics observations for station W0651 on Runnins River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. |
| W2427 | Runnins River | 2013 | 3 | MassDEP aesthetics observations for station W2427 on Runnins River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. |

**Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018)** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Field Sheet Count | Field Sheet Count w/ Film & Filamentous Algae Observations | Dense/ Very Dense Film/ Filamentous Algae |
|---|---|---|---|---|
| W0651 | 2013 | 3 | 1 | 0 |
| W2427 | 2013 | 3 | 1 | 0 |

**MassDEP Aesthetics Observations (2011-2018)** (MassDEP Undated 8)

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W0651 | Runnins River | 2013 | Color | Light Yellow/Tan | 2 | 3 |
| W0651 | Runnins River | 2013 | Color | NR | 1 | 3 |
| W0651 | Runnins River | 2013 | Objectionable Deposits | Not Applicable (N/A) | 3 | 3 |
| W0651 | Runnins River | 2013 | Odor | None | 1 | 3 |
| W0651 | Runnins River | 2013 | Odor | NR | 1 | 3 |

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W0651 | Runnins River | 2013 | Odor | Other | 1 | 3 |
| W0651 | Runnins River | 2013 | Scum | Not Applicable (N/A) | 3 | 3 |
| W0651 | Runnins River | 2013 | Turbidity | Moderately Turbid | 1 | 3 |
| W0651 | Runnins River | 2013 | Turbidity | NR | 1 | 3 |
| W0651 | Runnins River | 2013 | Turbidity | Slightly Turbid | 1 | 3 |
| W2427 | Runnins River | 2013 | Color | Light Yellow/Tan | 2 | 3 |
| W2427 | Runnins River | 2013 | Color | NR | 1 | 3 |
| W2427 | Runnins River | 2013 | Objectionable Deposits | Not Applicable (N/A) | 3 | 3 |
| W2427 | Runnins River | 2013 | Odor | NR | 1 | 3 |
| W2427 | Runnins River | 2013 | Odor | Other | 2 | 3 |
| W2427 | Runnins River | 2013 | Scum | Not Applicable (N/A) | 3 | 3 |
| W2427 | Runnins River | 2013 | Turbidity | Highly Turbid | 1 | 3 |
| W2427 | Runnins River | 2013 | Turbidity | NR | 1 | 3 |
| W2427 | Runnins River | 2013 | Turbidity | Slightly Turbid | 1 | 3 |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | YES |

**2022 Use Attainment Summary**

*E. coli* and *Enterococcus* bacteria samples were collected by MassDEP staff at the downstream end of this Runnings River AU (MA53-01) at the following sampling stations (data years): 1-2 times per year – Mink Street (W2427) and School Street (W0651) (2013). There were never more than two samples within a 90-day GM interval, however 3 out of the 5 *E. coli* samples exceed the 410 cfu/100ml STV with seasonal GMs ranging 570-757 cfu/100ml; and both of the *Enteroccocus* samples exceed the 130 cfu/100ml STV with a max of 1300 cfu/100ml at School St (W0651). MassDEP staff also conducted Bacteria Source Tracking (BST) work on the river and a summary of that effort's notes is as follows: Despite the identification of hotspot areas (in particular the "triangle area" between Mink and School Streets); human marker analysis for the triangle area in 2013 and 2017, indicated "inconclusive" evidence of a human source. Since the analysis indicated no caffeine or detergents (only the bacteroidetes markers were present), this can be indicative of a bird bacteria source. No correctable human source was ever found, and stormwater management was recommended. Too limited recent data are available to assess the Primary Recreational Use for this Runnins River AU (MA53-01) according to the CALM "Use Attainment Impairment Decision Schema". The Primary Contact Recreational Use will, therefore, continue to be assessed as Not Supporting with the *E. coli* and Fecal Coliform impairments being carried forward. An alert is being identified for elevated *Enterococcus* bacteria based on high counts in the river at School Street in 2013.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W0651 | MassDEP | Water Quality | Runnins River | [School Street, Seekonk] | 41.788377 | -71.329520 |
| W2427 | MassDEP | Water Quality | Runnins River | [Mink Street, Seekonk] | 41.789748 | -71.331999 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (MassDEP Undated 8) (MassDEP Undated 5)

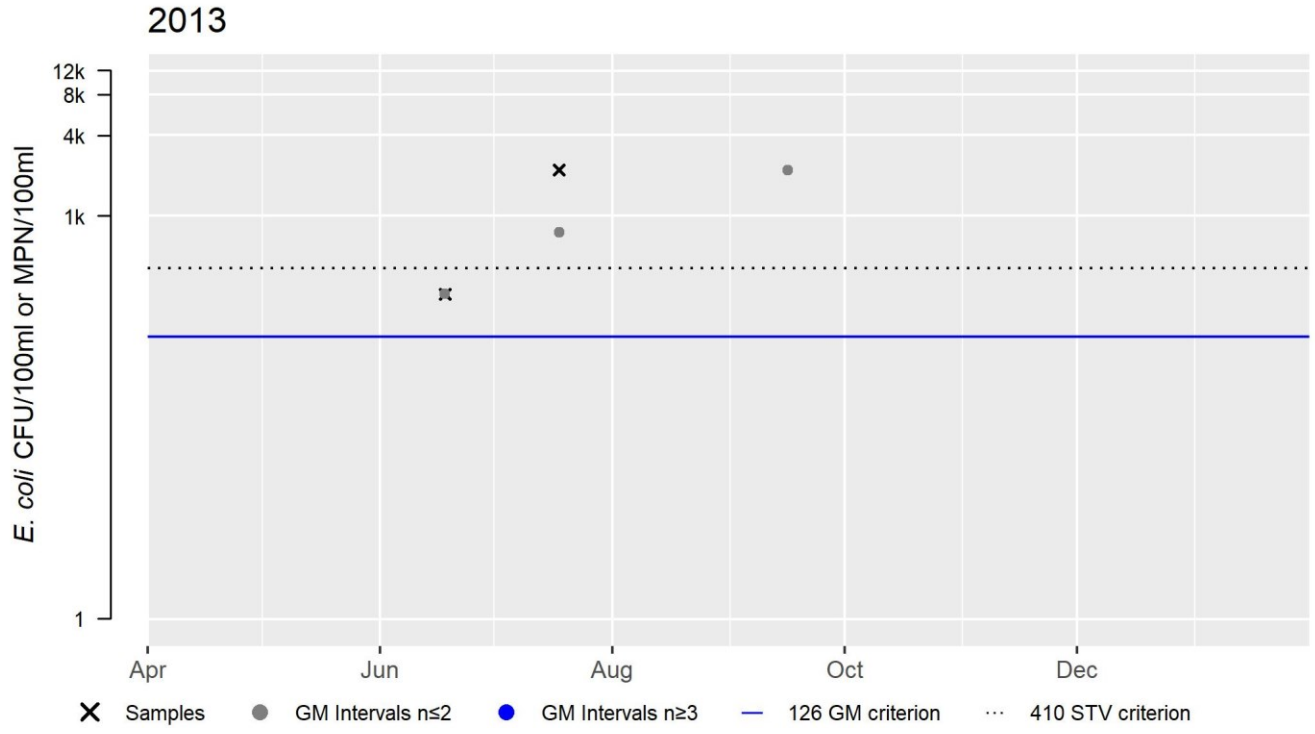
[Result units are CFU/100ml or MPN/100ml]

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| W0651 | MassDEP | E. coli | 06/18/13 | 07/18/13 | 2 | 262 | 2190 | 757 |
| W0651 | MassDEP | Enterococci | 10/01/13 | 10/01/13 | 1 | 1300 | 1300 | 1300 |
| W2427 | MassDEP | E. coli | 06/18/13 | 07/18/13 | 2 | 262 | 1240 | 570 |
| W2427 | MassDEP | Enterococci | 10/01/13 | 10/01/13 | 1 | 630 | 630 | 630 |

W0651 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 757 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

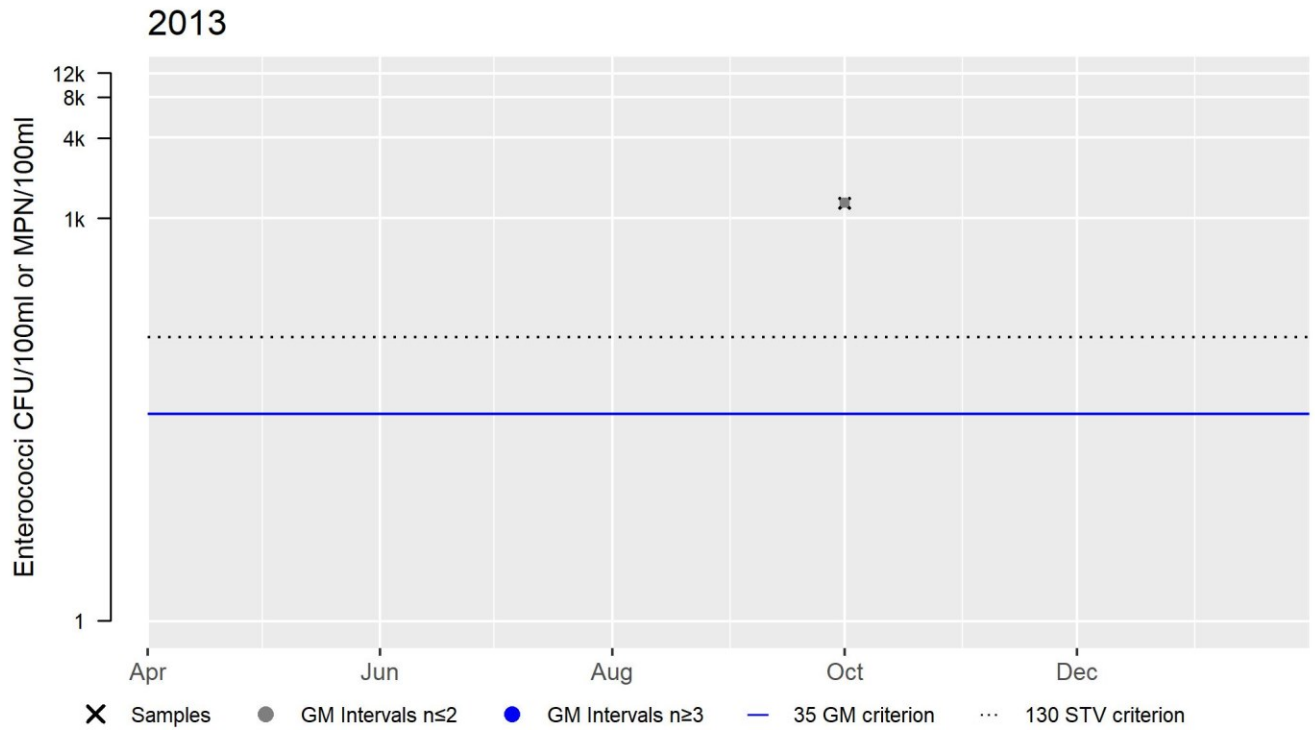
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



## W0651 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 1300 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

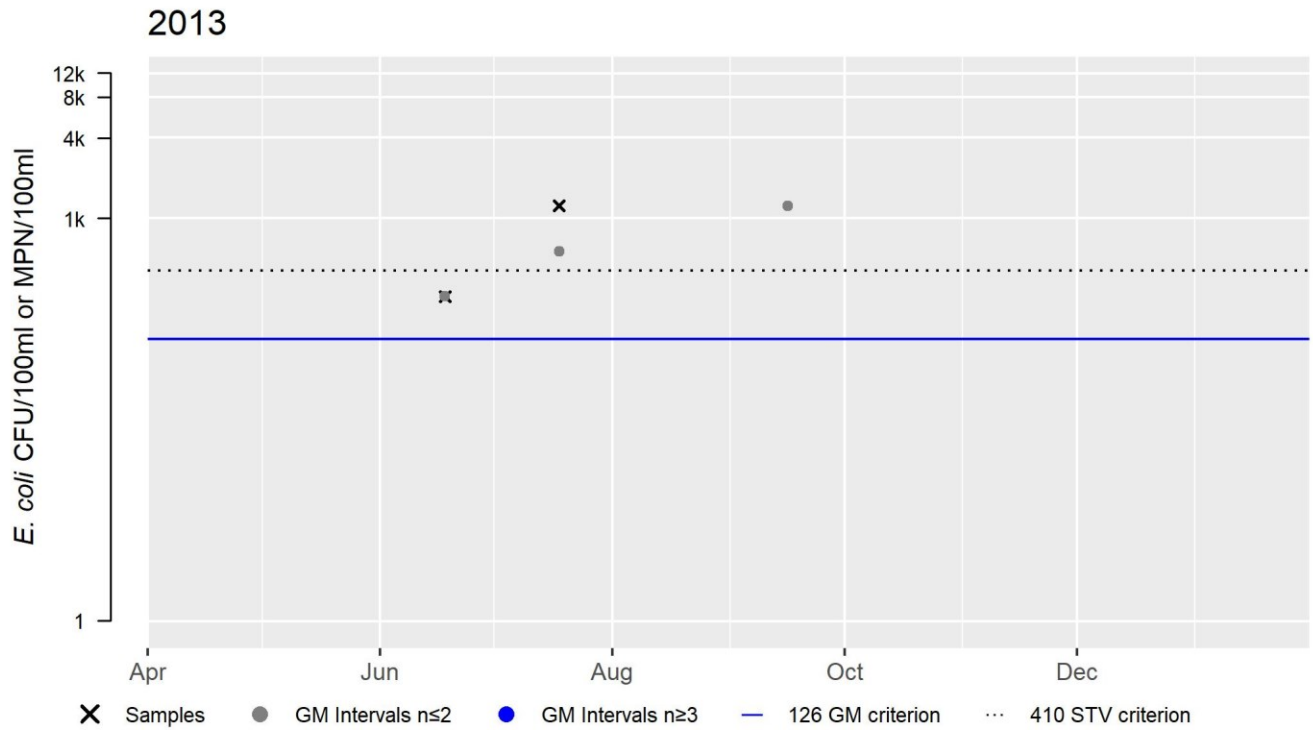
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



## W2427 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 570 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

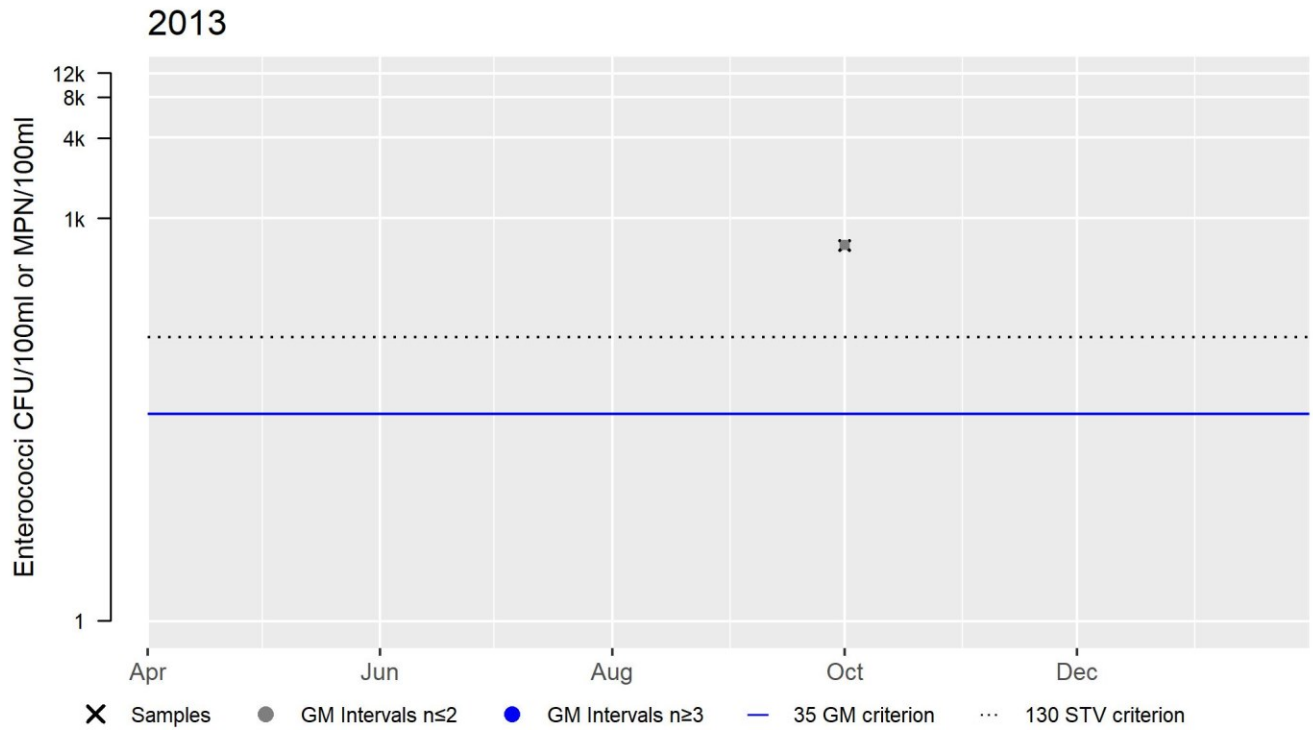
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



W2427 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 630 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

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




**MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019** (MassDEP Undated 1)

| **Summary** |
|---|
| Prior to 2011, BST work was conducted along the Runnins River AU (MA53-01) and in 4 unnamed tributaries; with a max *E. coli* count of 12,033MPN at School Street. Additional BST work was conducted between 2012-2014 and in 2017, at 6 sites along Runnins River and on 3 unnamed tributaries, with *E. coli* counts ranging 10 to 7,701MPN. Despite the identification of hotspot areas (in particular the "triangle area" between Mink and School Streets); human marker analysis for the triangle area in 2013 and 2017, indicated "inconclusive" evidence of a human source. It was further noted that since the human marker analysis indicated no caffeine or detergents, but only the bacteroidetes markers, this can be indicative of a bird bacteria source. Based on the human marker results and the low dry weather bacteria counts at all the tributaries and stormdrains in the triangle area, further BST work was halted. Stormwater management was recommended. No correctable source was ever found. |

## Secondary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |

**2022 Use Attainment Summary**

*E. coli* and *Enterococcus* bacteria samples were collected by MassDEP staff at the downstream end of this Runnings River AU (MA53-01) at Mink Street (W2427) and School Street (W0651) in June and July 2013. Too limited bacteria data are available to assess the Secondary Contact Recreational Use for this Runnins River AU (MA53-01) according to the CALM "Use Attainment Impairment Decision Schema". The Secondary Contact Recreational Use for this Runnins River AU (MA53-01) will continue to be assessed as Not Supporting with the *E. coli* and Fecal Coliform impairments being carried forward.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W0651 | MassDEP | Water Quality | Runnins River | [School Street, Seekonk] | 41.788377 | -71.329520 |
| W2427 | MassDEP | Water Quality | Runnins River | [Mink Street, Seekonk] | 41.789748 | -71.331999 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (MassDEP Undated 8) (MassDEP Undated 5)

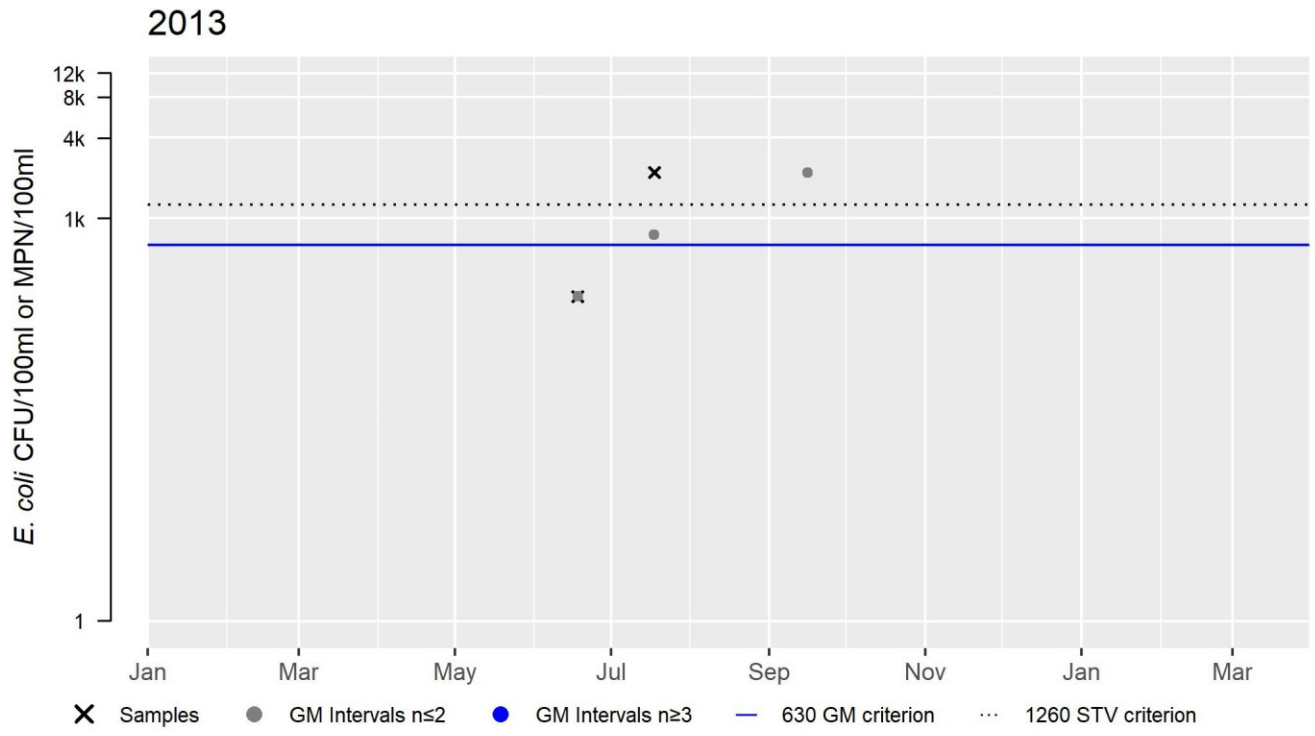
[Result units are CFU/100ml or MPN/100ml]

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| W0651 | MassDEP | E. coli | 06/18/13 | 07/18/13 | 2 | 262 | 2190 | 757 |
| W2427 | MassDEP | E. coli | 06/18/13 | 07/18/13 | 2 | 262 | 1240 | 570 |

## W0651 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 757 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

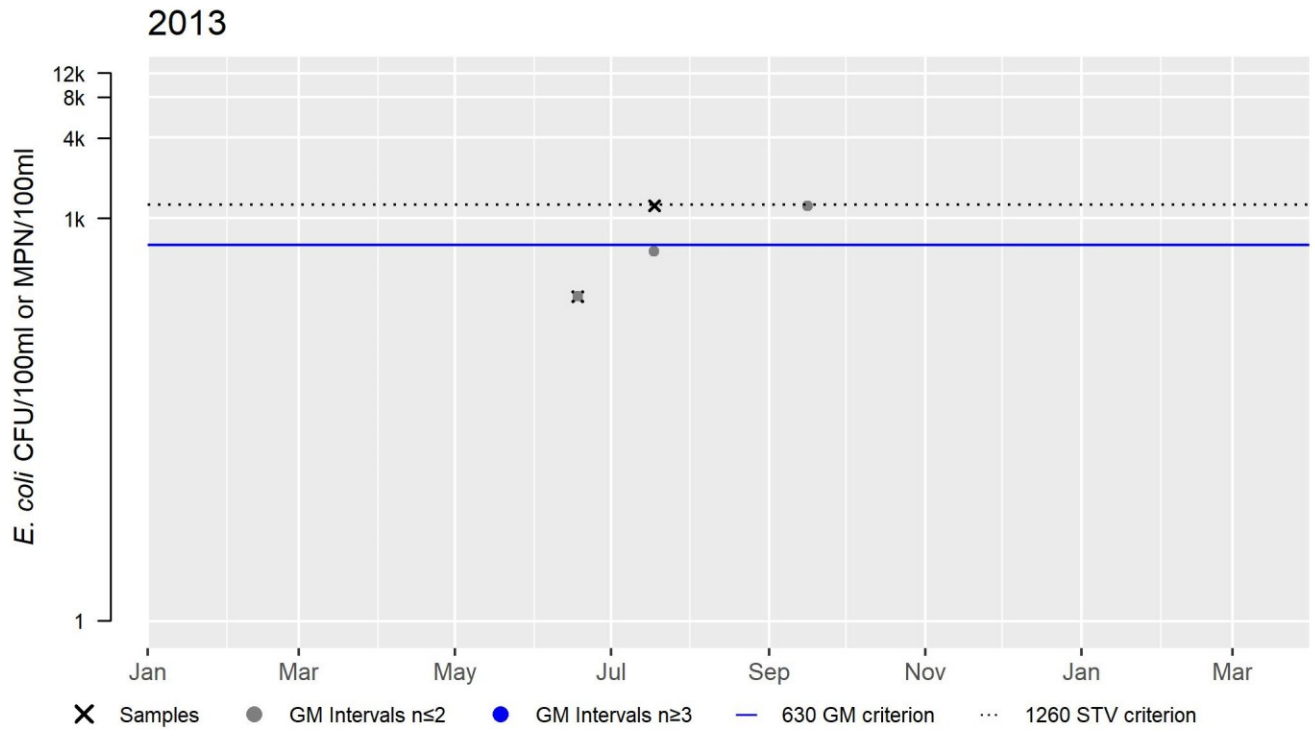
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



## W2427 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

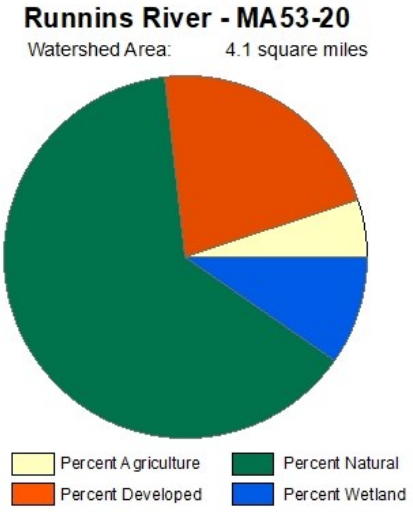
| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 570 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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



# Runnins River (MA53-20)

| | |
|---|---|
| **Location:** | Headwaters just north of Walmut Street, Rehoboth to Route 44, Seekonk. |
| **AU Type:** | RIVER |
| **AU Size:** | 3.5 MILES |
| **Classification/Qualifier:** | B |




| Landuse Type | Entire Basin | 5km Radius Proximal Subbasin | 100m Stream Buffer | Proximal Stream Buffer |
|---|---|---|---|---|
| Land Use Area (square miles) | 4.1 | 3.69 | 1.09 | 1.04 |
| Agriculture | 5.1% | 5.5% | 4.6% | 4.8% |
| Developed | 21.8% | 23.2% | 10.4% | 10.7% |
| Natural | 63.4% | 62.9% | 69.2% | 70.2% |
| Wetland | 9.7% | 8.4% | 15.7% | 14.3% |
| Impervious Cover | 8.1% | | | |

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

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

## Recommendations

| 2022 Recommendations |
|---|
| ALU: Conduct additional water column clean metals sampling in this Runnins River AU (MA53-20) downstream from Arcade Avenue, Seekonk, MA (W2408) to better evaluate if there is a lead contamination issue here (identified with alert, two samples slightly exceeded chronic lead criteria). |

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | YES |

**2022 Use Attainment Summary**

MassDEP biologists conducted water quality monitoring in this Runnins River AU (MA53-20) downstream from Arcade Avenue, Seekonk, MA as part of the MAP2 probabilistic wadeable streams monitoring project. Biological (benthic and fish) sampling was conducted in July (B0866) and September 2013 (SampleID 5078), respectively. The benthic community IBI score was indicative of moderately degraded conditions (44) while the fish sample in this low-moderate gradient habitat was comprised of 23% fluvial fishes with 38% of the sample intolerant/moderately tolerant macrohabitat generalists. During the summer 2013, water quality sampling (W2408) data were indicative of generally good conditions as follows: Deployed probe for DO (two 3-5 day deploys) DADMin 5.2 mg/L, deployed probes for temperature (June 1$^{st}$ – September 15$^{th}$ and two 3-5 day deploys) documented a max temperature of 26.7$^{o}$C with a max 24hr rolling average of 25.2$^{o}$C. Discrete sampling: DO minimum of 6mg/L (n=2); pH ranged 6.5-6.6SU (n=2); max temperature 23.6$^{o}$C (n=2). There was no evidence of nutrient enrichment issues: no observations of dense/very dense filamentous algae, maximum diel DO shift of 2.8mg/L, maximum DO saturation 97.8%, and the seasonal average total phosphorus was 0.065mg/L (max 0.091mg/L, n=5). Specific conductance was low (max 237µS/cm, n=2) as were chloride concentrations (max 45mg/L, n=4), and total ammonia nitrogen concentrations (max 0.05mg/L, n=4 with no toxicity estimated). Two of three of the metals samples slightly exceeded the chronic criteria for lead (TU 1.0 and 1.1), but there were no other acute or chronic metals criteria exceedances. The Aquatic Life Use of this Runnins River AU (MA53-20) is assessed as Not Supporting based on the moderately degraded benthic macroinvertebrates. An Alert is also being identified because of the two chronic lead criteria exceedances.

#### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| 5078 | MassDEP | Fish Community | Runnins River | ~50ft DS/SW of Arcade Ave, US of UNT to NW bank | 41.83046 | -71.32982 |
| B0866 | MassDEP | Benthic | Runnins River/ | [approximately 15 meters downstream/southwest from Arcade Avenue, Seekonk, MA (upstream of unnamed tributary on northwestern bank)] | 41.830588 | -71.329937 |
| W1955 | MassDEP | Water Quality | Runnins River | [Arcade Avenue, Seekonk] | 41.830667 | -71.329713 |
| W2408 | MassDEP | Water Quality | Runnins River | [approximately 50 feet downstream/southwest from Arcade Avenue, Seekonk (upstream of unnamed tributary on northwestern bank)] | 41.830588 | -71.329937 |
| W2441 | MassDEP | Water Quality | Runnins River | [Ledge Road, Seekonk] | 41.836247 | -71.323196 |
| W2442 | MassDEP | Water Quality | Runnins River | [Greenwood Avenue, Seekonk] | 41.835710 | -71.316507 |

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W2449 | MassDEP | Water Quality | Runnins River | [approximately 700 feet upstream/northeast of Ledge Road, Seekonk (upstream of private road crossing)] | 41.835765 | -71.321287 |
| W2505 | MassDEP | Water Quality | Runnins River | [approximately 370 feet upstream/east of Ledge Road, Seekonk] | 41.836297 | -71.322141 |
| W2567 | MassDEP | Water Quality | Runnins River | [approximately 150 feet upstream/north of Ledge Road, Seekonk] | 41.836467 | -71.322721 |
| W2568 | MassDEP | Water Quality | Runnins River | [approximately 260 feet upstream/north of Ledge Road, Seekonk] | 41.836486 | -71.322396 |

## *Biological Monitoring Information*

### Benthic Macroinvertebrate Data

**MassDEP Benthic Macroinvertebrate Data (2011-2017).** (MassDEP Undated 4)

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

| Station Code | Collection Date | Collection Method | Index Type | Organism Count | Index Score | Index Biological Condition Class |
|---|---|---|---|---|---|---|
| B0866 | 07/10/13 | RBP multihab | Statewide_Low_Gradient | 275 | 44 | MD |

### Fish Community Data and DELTS

**Fish Community Data (2012-2019) Provided by MassDFG.** (MassDFG 2020) (MassDEP Undated 2)

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

[Species List: AE = American Eel, GS = Golden Shiner, P = Pumpkinseed, RP = Redfin Pickerel, TD = Tesselated Darter]

| Sample ID | Sample Date | Method | Sample Type | Gradient | Total Taxa | Total Ind | Cold Ind % | Fluvial Taxa | Fluvial Ind % | Intol Ind % | I/MT MG Taxa | I/MT MG Ind % | Notables | CFR | Species List |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5078 | 09/17/13 | NS | TP | | 5 | 73 | 0% | 1 | 23% | 0% | 2 | 38% | No | No | AE, GS, P, RP, TD, |

## *Physico-chemical Water Quality Information*

### DO, pH, Temperature

**MassDEP Short-term Continuous Dissolved Oxygen Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[Note: Most deploys 3-5 days in length; Day Count= total # of days over all deploys; XDADMin= 3-5 Day Average of the Daily Minima, XDADA= 3-5 Day Average of the Daily Average, CW= Coldwater, WW= Warmwater]

| Station Code | Data Year | Deploys Count | Day Count | DO Min (mg/L) | Min XDADMin (mg/L) | Min XDADA (mg/L) | Delta DO Max (mg/L) | Count CW XDADMin <6.0 | Count CW 1Day Min <5.0 | Count WW Early Life Stages XDADA <6.5 | Count WW Early Life Stages 1Day Min <5.0 | Count WW Other Life Stages XDADMin <5.0 | Count WW Other Life Stages 1Day Min <4.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W2408 | 2013 | 2 | 8 | 5 | 5.2 | 5.7 | 2.8 | 1 | 0 | 1 | 0 | 0 | 0 |

**MassDEP Discrete Dissolved Oxygen Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| W2408 | 05/15/13 | 09/18/13 | 2 | 6 | 6.4 | 0 | 0 | 0 |

**MassDEP Long-term Continuous Temperature Data (Summer Index 2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Start Date | End Date | Index Count | 7day Count | Max Daily Mean (°C) | Max Temp (°C) | Max 7DADM (°C) | Max 7DADA (°C) | Count CWTier1 7DADM >20 | Count CWTier1 Daily Mean >23.5 | Count CWTier2 7DADA >21 | Count CWTier2 Daily Mean >24.1 | Count WW 7DADM >27.7 | Count WW Daily Mean >28.3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W2408 | 06/01/13 | 09/15/13 | 106 | 99 | 24.9 | 26.6 | 25.4 | 24.0 | 66 | 10 | 27 | 4 | 0 | 0 |

**MassDEP Short-term Continuous Temperature Data (Summer Index 2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[Summer Index is June 1 – Sept 15; Most Deploys 3-5 Days in Length; Day Count= total # of days over all deploys; Max Daily Mean= Maximum 24-Hour Average, XDADM= 3-5 Day Average of the Daily Maxima, XDADA= 3-5 Day Average of the Daily Average, CW= Coldwater, WW= Warmwater]

| Station Code | Data Year | Deploys Count | Day Count | Max Daily Mean (°C) | Max Temp (°C) | Max XDADM (°C) | Max XDADA (°C) | Count CWTier1 XDADM >20 | Count CWTier1 Daily Mean >23.5 | Count CWTier2 XDADA >21 | Count CWTier2 Daily Mean >24.1 | Count WW XDADM >27.7 | Count WW Daily Mean >28.3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W2408 | 2013 | 2 | 8 | 25.1 | 26.7 | 25.2 | 23.9 | 1 | 2 | 1 | 2 | 0 | 0 |

**24-hour Rolling Average Calculations for MassDEP Short- and Long-term Continuous Temperature Data (Summer Index 2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Start Date | End Date | Count Days Deployed | 24hr Rolling Count | Max 24hr Avg Rolling Temp (°C) | Count CWTier1 24hr Avg Rolling >23.5 °C | Count CWTier2 24hr Avg Rolling >24.1 °C | Count WW 24hr Avg Rolling >28.3°C |
|---|---|---|---|---|---|---|---|---|
| W2408 | 06/01/13 | 09/15/13 | 107 | 5134 | 25.0 | 500 | 192 | 0 |
| W2408 | 07/18/13 | 08/20/13 | 33 | 389 | 25.2 | 109 | 95 | 0 |

**MassDEP Discrete Temperature Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)
[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| W2408 | 05/15/13 | 09/18/13 | 4 | 2 | 23.6 | 18.1 | 2 | 1 | 0 | 0 |

**MassDEP Discrete pH Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 & >8.3 | pH Count <6.0 & >8.8 |
|---|---|---|---|---|---|---|---|
| W2408 | 05/15/13 | 09/18/13 | 2 | 6.5 | 6.6 | 0 | 0 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**MassDEP Nutrient Enrichment Indicator Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | Delta DO Max (mg/L) | Delta DO Avg (mg/L) | DO Sat Max (%) | pH Max (SU) | Count Algal Obsv. | Dense/V. Dense Film/Fila. Algae |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W1955 | 2013 | -- | -- | -- | -- | -- | -- | -- | -- | 2 | 0 |
| W2408 | 2013 | 5 | 0.046 | 0.091 | 0.065 | 2.8 | 1.0 | 97.8 | 6.6 | 7 | 0 |
| W2441 | 2013 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |
| W2441 | 2014 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |
| W2442 | 2013 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |
| W2449 | 2013 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |
| W2505 | 2015 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |
| W2567 | 2015 | -- | -- | -- | -- | -- | -- | -- | -- | 2 | 0 |
| W2568 | 2015 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |

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

**MassDEP Clean Metals Water Column Data (2011-2018), Acute Criteria Violations.** (MassDEP Undated 8) (MassDEP Undated 5)
[CMC= Criterion Maximum Concentration, TU= Toxic Unit]

| Station Code | Data Year | Metals Count | As CMC TU >1 | Cd CMC TU >1 | Cr III CMC TU >1 | Cu CMC TU >1 | Pb CMC TU >1 | Ni CMC TU >1 | Ag CMC TU >1 | Zn CMC TU >1 |
|---|---|---|---|---|---|---|---|---|---|---|
| W2408 | 2013 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**MassDEP Clean Metals Water Column Data (2011-2018), Chronic Criteria Violations.** (MassDEP Undated 8) (MassDEP Undated 5)

[CCC= Criterion Continuous Concentration, TU= Toxic Unit]

| Station Code | Data Year | Metals Count | As CCC TU >1 | Cd CCC TU >1 | Cr III CCC TU >1 | Cu CCC TU >1 | Pb CCC TU >1 | Ni CCC TU >1 | Se CCC TU >1 | Zn CCC TU >1 |
|---|---|---|---|---|---|---|---|---|---|---|
| W2408 | 2013 | 3 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |

**MassDEP Clean Metals Water Column Data (2011-2018), Selected TU Calculations.** (MassDEP Undated 8) (MassDEP Undated 5)

[CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

| Station Code | Sample Date | Cd CMC TU | Cd CCC TU | Cu CMC TU | Cu CCC TU | Pb CMC TU | Pb CCC TU |
|---|---|---|---|---|---|---|---|
| W2408 | 05/20/13 | 0.1 | 0.3 | 0.3 | 0.36 | 0.0 | 0.6 |
| W2408 | 07/01/13 | 0.2 | 0.4 | 0.2 | 0.32 | 0.0 | 1.0 |
| W2408 | 08/12/13 | 0.2 | 0.4 | 0.3 | 0.39 | 0.0 | 1.1 |

**MassDEP Dissolved Aluminum Water Column Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[Since only dissolved aluminum data were available, these data were compared to the default freshwater criteria for total recoverable aluminum (TRA), presented in Appendix E of MassDEP's 2022 CALM. As dissolved Al is a fraction of TRA, an exceedance count of 0 does not rule out violations of the TRA criteria. CMC= Criterion Maximum Concentration, CCC= Criterion Continuous Concentration, TU= Toxic Unit]

| Station Code | Data Year | Dissolved Al Count | Al Min (mg/L) | Al Max (mg/L) | Al Avg (mg/L) | Al CMC TU Max | Al CCC TU Max | Al CMC TU >1 | Al CCC TU >1 |
|---|---|---|---|---|---|---|---|---|---|
| W2408 | 2013 | 3 | 0.084 | 0.16 | 0.135 | 0.4 | 0.7 | 0 | 0 |

**MassDEP Total Ammonia Nitrogen (TAN) Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

[TAN= NH3 + NH4+]

| Station Code | Data Year | TAN Count | TAN Min (mg/L) | TAN Max (mg/L) | TAN Avg (mg/L) | Count TAN >Chronic | Count TAN >Acute |
|---|---|---|---|---|---|---|---|
| W2408 | 2013 | 4 | 0.030 | 0.050 | 0.040 | 0 | 0 |

**MassDEP Chloride Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Chloride Count | Chloride Min (mg/L) | Chloride Max (mg/L) | Chloride Avg (mg/L) | Count Chloride >230 | Count Chloride >860 |
|---|---|---|---|---|---|---|---|
| W2408 | 2013 | 4 | 10 | 45 | 31 | 0 | 0 |

**MassDEP Discrete Specific Conductance Data (2011-2018) Compared to Estimated Chloride Criteria.** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W2408 | 05/15/13 | 09/18/13 | 2 | 193 | 237 | 0 | 0 | 0 | 0 | 0 | 0 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH; therefore, the Fish Consumption Use for this Runnins River AU (MA53-20) is Not Assessed. | |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | NO |
| **2022 Use Attainment Summary** | |
| MassDEP staff recorded observation information along this Runnins River AU (MA53-20) in Seekonk, consisting of the following stations (data years): Greenwood Avenue (W2442) (2013); ~ 700 feet upstream Ledge Road (W2449) (2013); ~370 feet upstream Ledge Road (W2505) (2014-2015); ~260 feet upstream Ledge Road (W2568) (2015); ~150 feet upstream Ledge Road (W2567) (2015); Ledge Road (W2441) (2013-2015); Arcade Avenue (W1955) (2013) & ~50 feet downstream Arcade Avenue, Seekonk (W2408) (2013) (overall n=28). While data were limited to two observations at most sites/sampling year, there were many observations of the river at Arcade Ave, Seekonk (W2408) during the summer 2013. There were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews at any of the stations for any of the data years. The Aesthetics Use for this Runnins River AU (MA53-20) will continue to be assessed as Fully Supporting. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W1955 | MassDEP | Water Quality | Runnins River | [Arcade Avenue, Seekonk] | 41.830667 | -71.329713 |
| W2408 | MassDEP | Water Quality | Runnins River | [approximately 50 feet downstream/southwest from Arcade Avenue, Seekonk (upstream of unnamed tributary on northwestern bank)] | 41.830588 | -71.329937 |
| W2441 | MassDEP | Water Quality | Runnins River | [Ledge Road, Seekonk] | 41.836247 | -71.323196 |
| W2442 | MassDEP | Water Quality | Runnins River | [Greenwood Avenue, Seekonk] | 41.835710 | -71.316507 |
| W2449 | MassDEP | Water Quality | Runnins River | [approximately 700 feet upstream/northeast of Ledge Road, Seekonk (upstream of private road crossing)] | 41.835765 | -71.321287 |
| W2505 | MassDEP | Water Quality | Runnins River | [approximately 370 feet upstream/east of Ledge Road, Seekonk] | 41.836297 | -71.322141 |
| W2567 | MassDEP | Water Quality | Runnins River | [approximately 150 feet upstream/north of Ledge Road, Seekonk] | 41.836467 | -71.322721 |
| W2568 | MassDEP | Water Quality | Runnins River | [approximately 260 feet upstream/north of Ledge Road, Seekonk] | 41.836486 | -71.322396 |

### *Aesthetic Observations*

**Aesthetics Summary Statements for MassDEP Stations (2011-2018)** (MassDEP Undated 5)

| Station Code | Waterbody | Data Year | Field Sheet Count | Aesthetics Summary Statement |
|---|---|---|---|---|
| W1955 | Runnins River | 2013 | 2 | MassDEP aesthetics observations for station W1955 on Runnins River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |
| W2408 | Runnins River | 2013 | 8 | MassDEP aesthetics observations for station W2408/MAP2-443 on Runnins River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. |
| W2441 | Runnins River | 2013 | 2 | MassDEP aesthetics observations for station W2441 on Runnins River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |
| W2441 | Runnins River | 2014 | 2 | MassDEP aesthetics observations for station W2441 on Runnins River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2014. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |
| W2441 | Runnins River | 2015 | 2 | MassDEP aesthetics observations for station W2441 on Runnins River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2015. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |
| W2442 | Runnins River | 2013 | 2 | MassDEP aesthetics observations for station W2442 on Runnins River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |
| W2449 | Runnins River | 2013 | 2 | MassDEP aesthetics observations for station W2449 on Runnins River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |
| W2505 | Runnins River | 2014 | 2 | MassDEP aesthetics observations for station W2505 on Runnins River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2014. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |
| W2505 | Runnins River | 2015 | 2 | MassDEP aesthetics observations for station W2505 on Runnins River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2015. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |

| Station Code | Waterbody | Data Year | Field Sheet Count | Aesthetics Summary Statement |
|---|---|---|---|---|
| W2567 | Runnins River | 2015 | 2 | MassDEP aesthetics observations for station W2567 on Runnins River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2015. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |
| W2568 | Runnins River | 2015 | 2 | MassDEP aesthetics observations for station W2568 on Runnins River can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2015. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=2). |

**Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018)** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Field Sheet Count | Field Sheet Count w/ Film & Filamentous Algae Observations | Dense/ Very Dense Film/ Filamentous Algae |
|---|---|---|---|---|
| W1955 | 2013 | 2 | 2 | 0 |
| W2408 | 2013 | 8 | 7 | 0 |
| W2441 | 2013 | 2 | 1 | 0 |
| W2441 | 2014 | 2 | 1 | 0 |
| W2441 | 2015 | 2 | 0 | 0 |
| W2442 | 2013 | 2 | 1 | 0 |
| W2449 | 2013 | 2 | 1 | 0 |
| W2505 | 2014 | 2 | 0 | 0 |
| W2505 | 2015 | 2 | 1 | 0 |
| W2567 | 2015 | 2 | 2 | 0 |
| W2568 | 2015 | 2 | 1 | 0 |

**MassDEP Aesthetics Observations (2011-2018)** (MassDEP Undated 8)

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W1955 | Runnins River | 2013 | Color | Light Yellow/Tan | 2 | 2 |
| W1955 | Runnins River | 2013 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W1955 | Runnins River | 2013 | Odor | None | 2 | 2 |
| W1955 | Runnins River | 2013 | Scum | Not Applicable (N/A) | 2 | 2 |
| W1955 | Runnins River | 2013 | Turbidity | Moderately Turbid | 1 | 2 |
| W1955 | Runnins River | 2013 | Turbidity | Slightly Turbid | 1 | 2 |
| W2408 | Runnins River | 2013 | Color | Dark Tan | 1 | 8 |
| W2408 | Runnins River | 2013 | Color | Light Yellow/Tan | 4 | 8 |
| W2408 | Runnins River | 2013 | Color | None | 1 | 8 |
| W2408 | Runnins River | 2013 | Color | Reddish | 2 | 8 |
| W2408 | Runnins River | 2013 | Objectionable Deposits | No | 4 | 8 |
| W2408 | Runnins River | 2013 | Objectionable Deposits | Unobservable | 1 | 8 |
| W2408 | Runnins River | 2013 | Objectionable Deposits | Yes | 3 | 8 |
| W2408 | Runnins River | 2013 | Odor | None | 8 | 8 |
| W2408 | Runnins River | 2013 | Scum | No | 7 | 8 |

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W2408 | Runnins River | 2013 | Scum | Yes | 1 | 8 |
| W2408 | Runnins River | 2013 | Turbidity | None | 8 | 8 |
| W2441 | Runnins River | 2013 | Color | Light Yellow/Tan | 1 | 2 |
| W2441 | Runnins River | 2013 | Color | None | 1 | 2 |
| W2441 | Runnins River | 2013 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W2441 | Runnins River | 2013 | Odor | None | 2 | 2 |
| W2441 | Runnins River | 2013 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2441 | Runnins River | 2013 | Turbidity | Moderately Turbid | 1 | 2 |
| W2441 | Runnins River | 2013 | Turbidity | Slightly Turbid | 1 | 2 |
| W2441 | Runnins River | 2014 | Color | Light Yellow/Tan | 1 | 2 |
| W2441 | Runnins River | 2014 | Color | None | 1 | 2 |
| W2441 | Runnins River | 2014 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W2441 | Runnins River | 2014 | Odor | None | 2 | 2 |
| W2441 | Runnins River | 2014 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2441 | Runnins River | 2014 | Turbidity | Slightly Turbid | 2 | 2 |
| W2441 | Runnins River | 2015 | Color | Light Yellow/Tan | 2 | 2 |
| W2441 | Runnins River | 2015 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W2441 | Runnins River | 2015 | Odor | None | 2 | 2 |
| W2441 | Runnins River | 2015 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2441 | Runnins River | 2015 | Turbidity | Slightly Turbid | 2 | 2 |
| W2442 | Runnins River | 2013 | Color | Light Yellow/Tan | 1 | 2 |
| W2442 | Runnins River | 2013 | Color | None | 1 | 2 |
| W2442 | Runnins River | 2013 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W2442 | Runnins River | 2013 | Odor | None | 2 | 2 |
| W2442 | Runnins River | 2013 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2442 | Runnins River | 2013 | Turbidity | Moderately Turbid | 1 | 2 |
| W2442 | Runnins River | 2013 | Turbidity | Slightly Turbid | 1 | 2 |
| W2449 | Runnins River | 2013 | Color | None | 2 | 2 |
| W2449 | Runnins River | 2013 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W2449 | Runnins River | 2013 | Odor | None | 2 | 2 |
| W2449 | Runnins River | 2013 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2449 | Runnins River | 2013 | Turbidity | Moderately Turbid | 1 | 2 |
| W2449 | Runnins River | 2013 | Turbidity | Slightly Turbid | 1 | 2 |
| W2505 | Runnins River | 2014 | Color | Light Yellow/Tan | 1 | 2 |
| W2505 | Runnins River | 2014 | Color | None | 1 | 2 |
| W2505 | Runnins River | 2014 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W2505 | Runnins River | 2014 | Odor | None | 2 | 2 |
| W2505 | Runnins River | 2014 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2505 | Runnins River | 2014 | Turbidity | Slightly Turbid | 2 | 2 |
| W2505 | Runnins River | 2015 | Color | Light Yellow/Tan | 2 | 2 |
| W2505 | Runnins River | 2015 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W2505 | Runnins River | 2015 | Odor | None | 2 | 2 |
| W2505 | Runnins River | 2015 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2505 | Runnins River | 2015 | Turbidity | Slightly Turbid | 2 | 2 |
| W2567 | Runnins River | 2015 | Color | Light Yellow/Tan | 2 | 2 |
| W2567 | Runnins River | 2015 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W2567 | Runnins River | 2015 | Odor | None | 2 | 2 |
| W2567 | Runnins River | 2015 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2567 | Runnins River | 2015 | Turbidity | Slightly Turbid | 2 | 2 |
| W2568 | Runnins River | 2015 | Color | Light Yellow/Tan | 2 | 2 |
| W2568 | Runnins River | 2015 | Objectionable Deposits | Not Applicable (N/A) | 2 | 2 |
| W2568 | Runnins River | 2015 | Odor | None | 2 | 2 |
| W2568 | Runnins River | 2015 | Scum | Not Applicable (N/A) | 2 | 2 |
| W2568 | Runnins River | 2015 | Turbidity | Slightly Turbid | 2 | 2 |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria sample were collected by MassDEP staff along this Runnins River AU (MA53-20) at the following sampling stations (data years) as part of either Bacteria Source Tracking (BST) projects or as part of the MAP2 sampling project: MassDEP 1 to 5 times per year – Greenwood Avenue (W2442) (2013); ~ 700 feet upstream Ledge Road (W2449) (2013); ~370 feet upstream Ledge Road (W2505) (2014-2015); ~260 feet upstream Ledge Road (W2568) (2015); ~150 feet upstream Ledge Road (W2567) (2015); Ledge Road (W2441) (2013-2015); Arcade Avenue (W1955) (2013) & ~50 feet downstream Arcade Avenue, Seekonk (W2408) (2013). The BST work was conducted at 11 sites in total along the river between 2012 & 2015 with the following notes reported: "Despite the identification of hotspot areas (the Arcade Ave/Ledge Rd area), human marker analysis at Ledge Rd in 2015, indicated 'none', for evidence of a human source. No correctable source was ever found." Too limited bacteria samples were collected at these BST sites to assess the Primary Contact Recreational Use for this AU according to the CALM "Use Attainment Impairment Decision Schema". At Arcade Ave (W2408) in 2013, data analysis indicated 33% of intervals had GMs >126 cfu/100ml, only one sample exceeded the 410 cfu/100ml STV, with a seasonal GM of 108 cfu/100ml. Although these data do not exceed the CALM "Use Attainment Impairment Decision Schema" since bacteria data collected further upstream at Ledge Rd (W2441) significantly exceeded the STV 1-2 times in 2013 and 2014, the removal of the E. coli impairment is not considered to be warranted at this time. The Primary Contact Recreational Use for this Runnins River AU (MA53-20) will continue to be assessed as Not Supporting with the *E. coli* impairment being carried forward. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W1955 | MassDEP | Water Quality | Runnins River | [Arcade Avenue, Seekonk] | 41.830667 | -71.329713 |
| W2408 | MassDEP | Water Quality | Runnins River | [approximately 50 feet downstream/southwest from Arcade Avenue, Seekonk (upstream of unnamed tributary on northwestern bank)] | 41.830588 | -71.329937 |
| W2441 | MassDEP | Water Quality | Runnins River | [Ledge Road, Seekonk] | 41.836247 | -71.323196 |
| W2442 | MassDEP | Water Quality | Runnins River | [Greenwood Avenue, Seekonk] | 41.835710 | -71.316507 |
| W2449 | MassDEP | Water Quality | Runnins River | [approximately 700 feet upstream/northeast of Ledge Road, Seekonk (upstream of private road crossing)] | 41.835765 | -71.321287 |

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W2505 | MassDEP | Water Quality | Runnins River | [approximately 370 feet upstream/east of Ledge Road, Seekonk] | 41.836297 | -71.322141 |
| W2567 | MassDEP | Water Quality | Runnins River | [approximately 150 feet upstream/north of Ledge Road, Seekonk] | 41.836467 | -71.322721 |
| W2568 | MassDEP | Water Quality | Runnins River | [approximately 260 feet upstream/north of Ledge Road, Seekonk] | 41.836486 | -71.322396 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (MassDEP Undated 8) (MassDEP Undated 5)

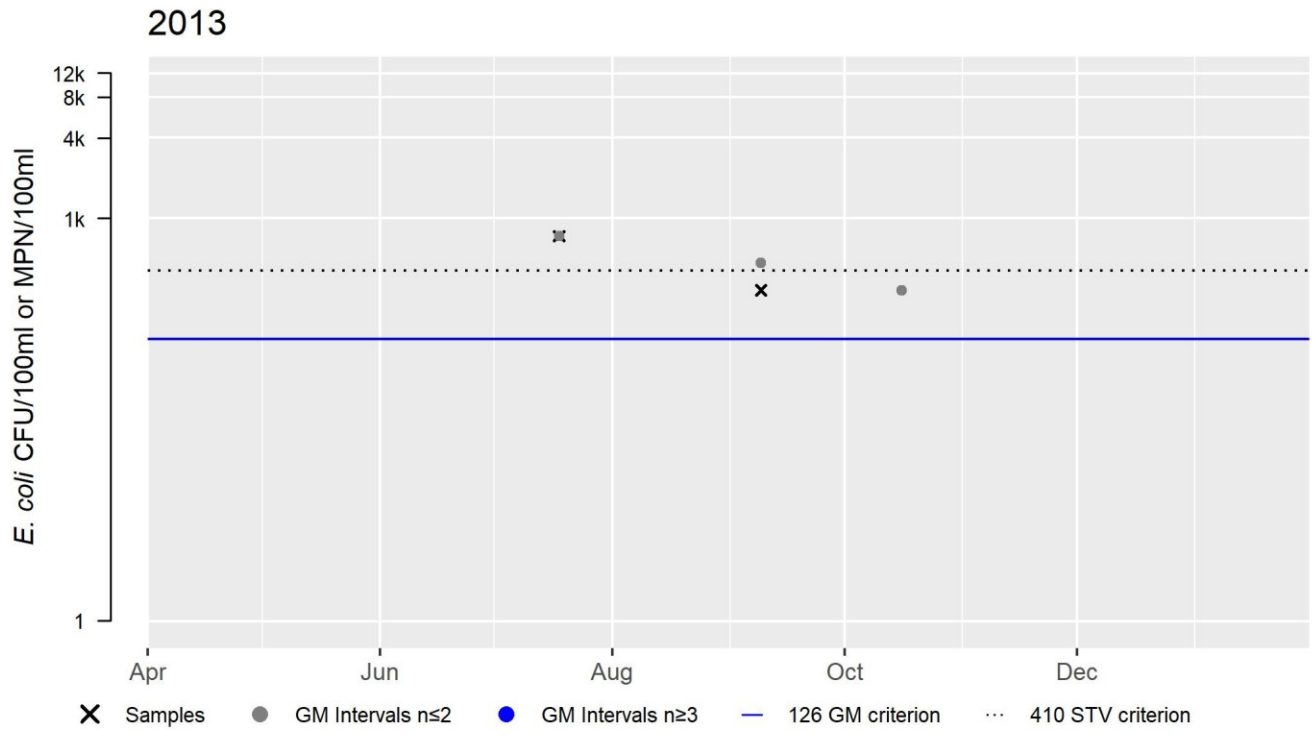
[Result units are CFU/100ml or MPN/100ml]

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| W1955 | MassDEP | E. coli | 07/18/13 | 09/09/13 | 2 | 291 | 738 | 463 |
| W2408 | MassDEP | E. coli | 05/16/13 | 09/11/13 | 5 | 30 | 417 | 108 |
| W2441 | MassDEP | E. coli | 09/09/13 | 10/22/13 | 2 | 816 | 2419.6 | 1405 |
| W2441 | MassDEP | E. coli | 06/09/14 | 07/31/14 | 2 | 199 | 7270 | 1203 |
| W2441 | MassDEP | Enterococci | 08/19/14 | 08/19/14 | 1 | 1800 | 1800 | 1800 |
| W2441 | MassDEP | E. coli | 05/07/15 | 07/07/15 | 2 | 41 | 178 | 85 |
| W2442 | MassDEP | E. coli | 09/09/13 | 10/22/13 | 2 | 7 | 166 | 34 |
| W2449 | MassDEP | E. coli | 10/22/13 | 10/22/13 | 1 | 14 | 14 | 14 |
| W2505 | MassDEP | E. coli | 06/09/14 | 07/31/14 | 2 | 185 | 2419.6 | 669 |
| W2505 | MassDEP | E. coli | 05/07/15 | 07/07/15 | 2 | 68 | 261 | 133 |
| W2567 | MassDEP | E. coli | 05/07/15 | 07/07/15 | 2 | 71 | 365 | 161 |
| W2568 | MassDEP | E. coli | 05/07/15 | 07/07/15 | 2 | 48 | 548 | 162 |

## W1955 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 463 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

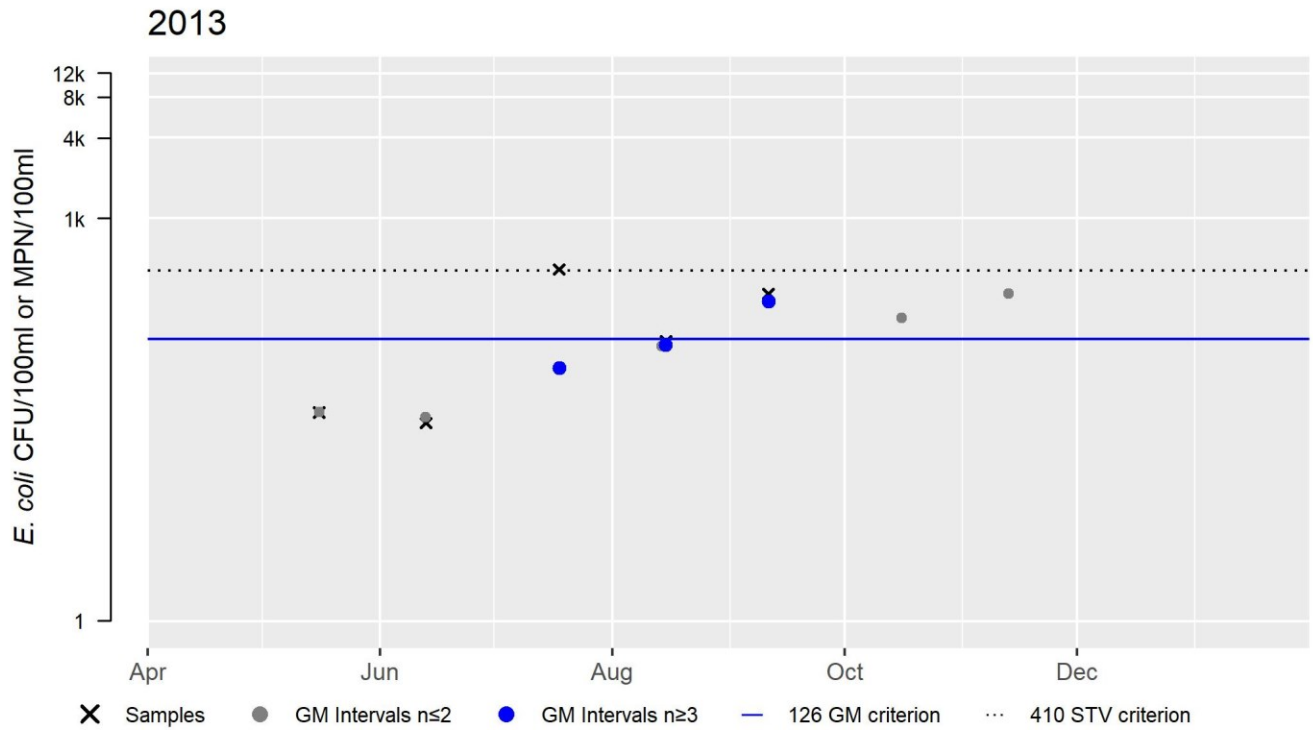
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



## W2408 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 5 |
| SeasGM | 108 |
| #GMI | 3 |
| #GMI Ex | 1 |
| %GMI Ex | 33 |
| n>STV | 1 |
| %n>STV | 20 |

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



## W2441 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

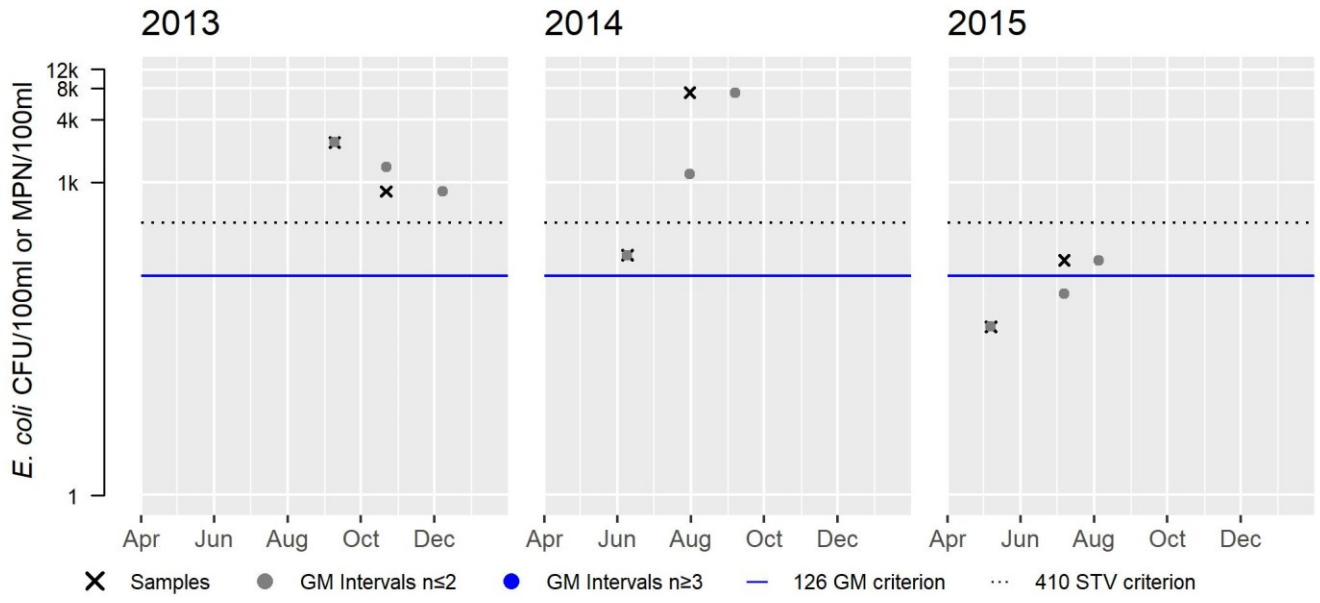
| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 1405 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 2 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 1203 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 85 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

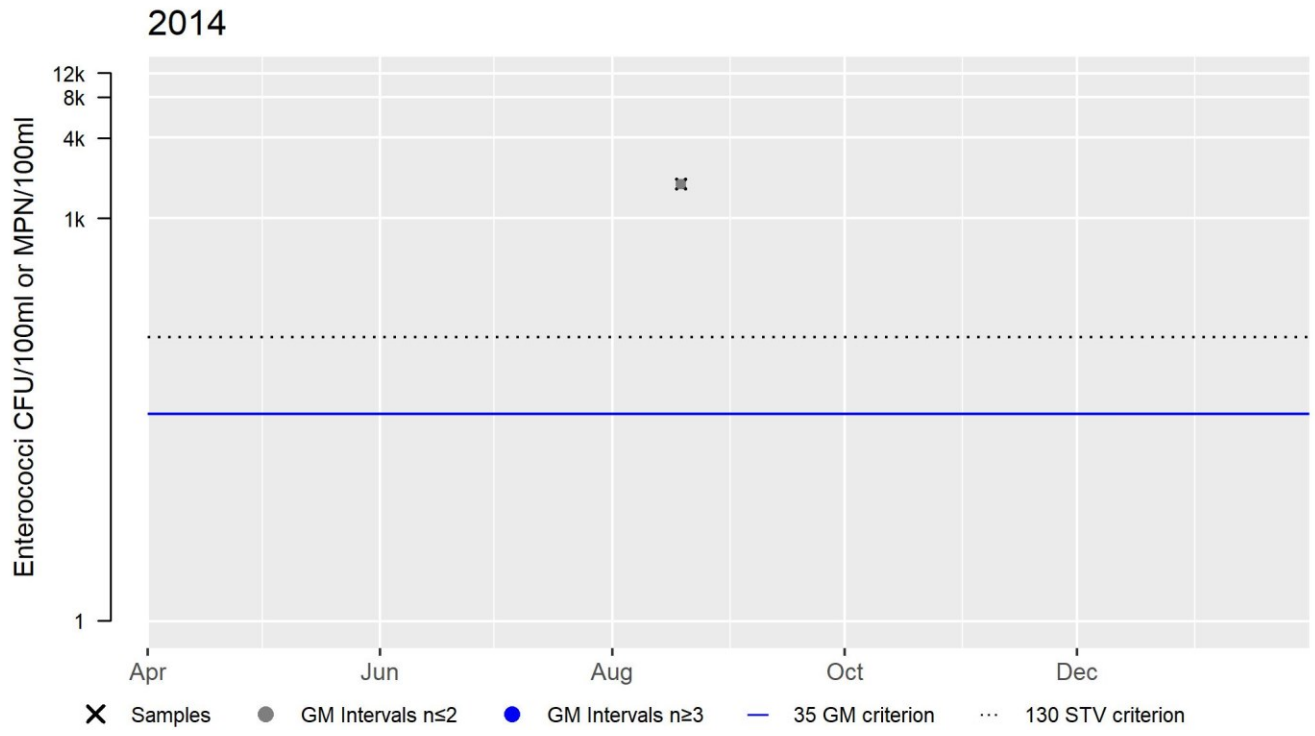
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



## W2441 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 1800 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

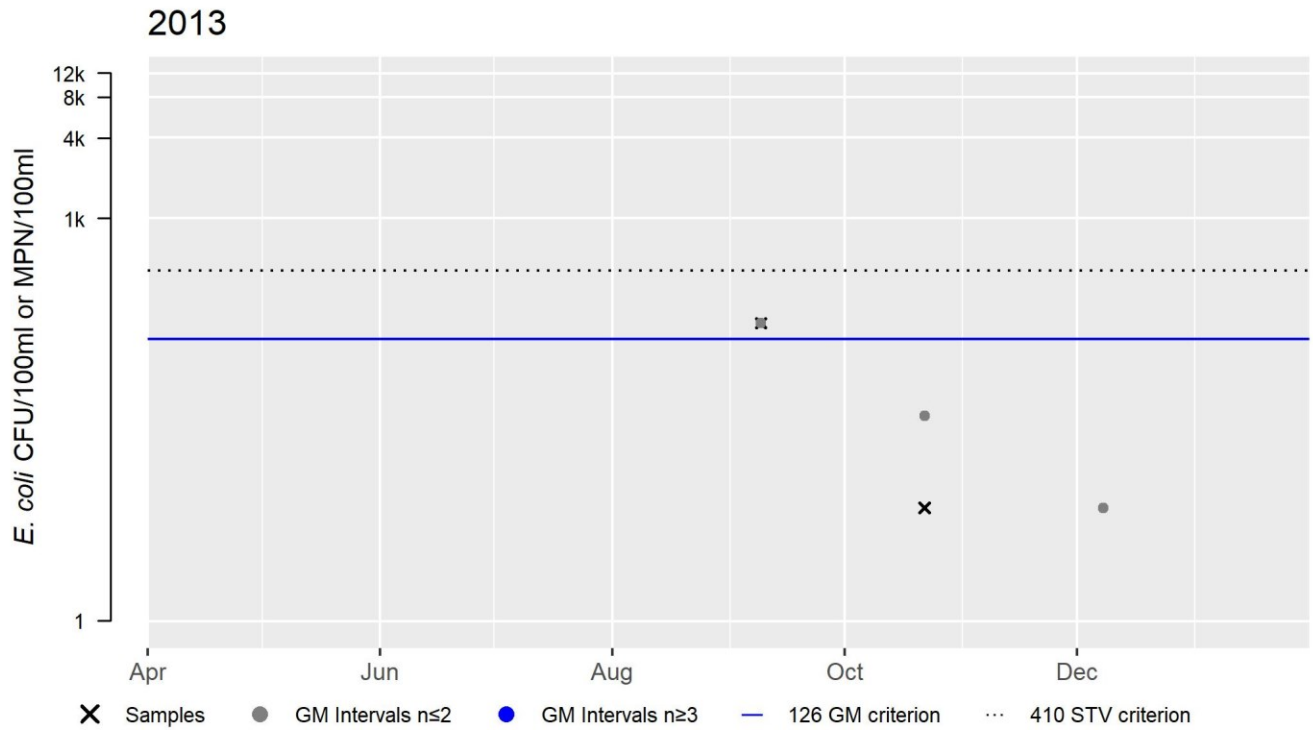
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



## W2442 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 34 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

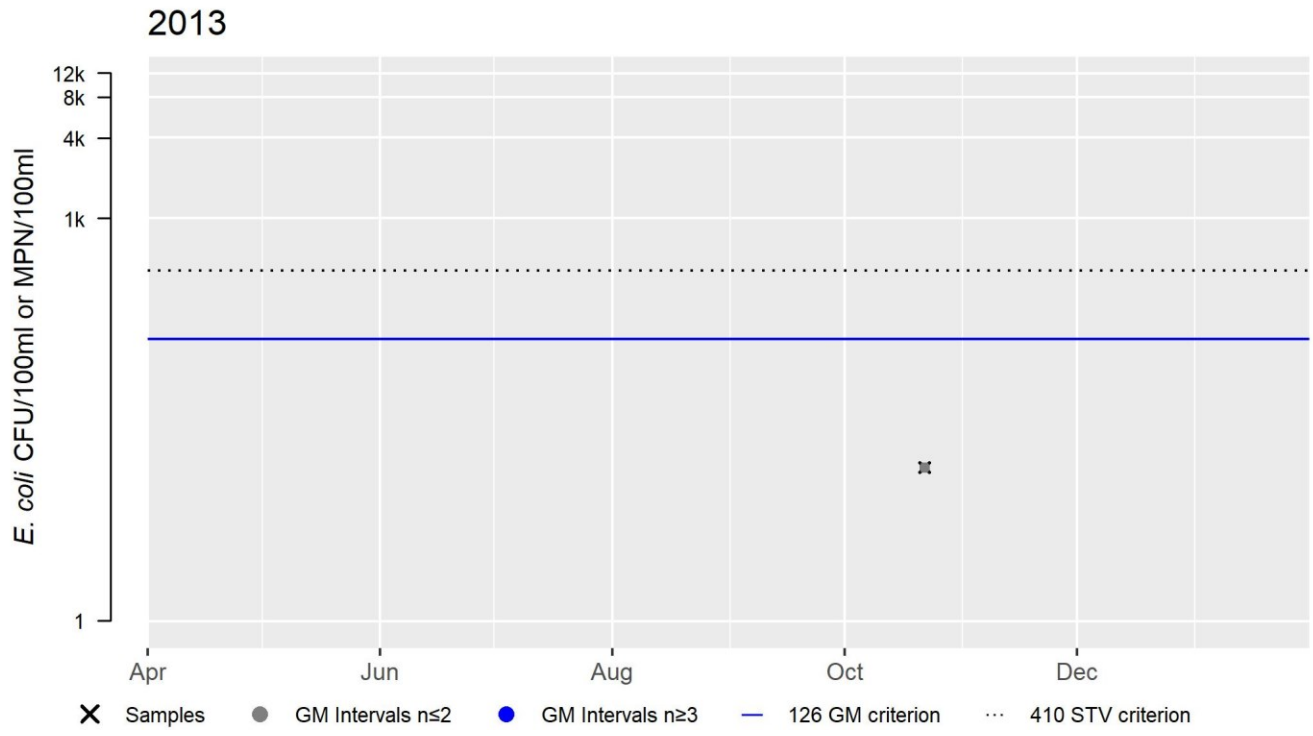
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



## W2449 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 14 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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



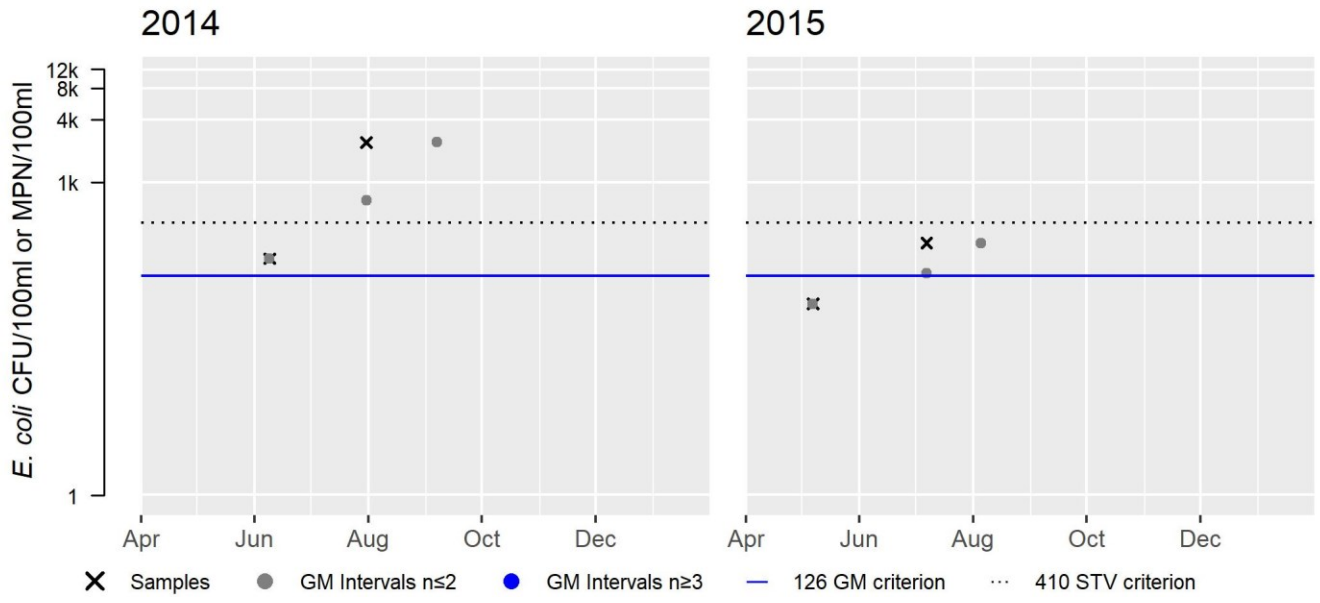
## W2505 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 669 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 133 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

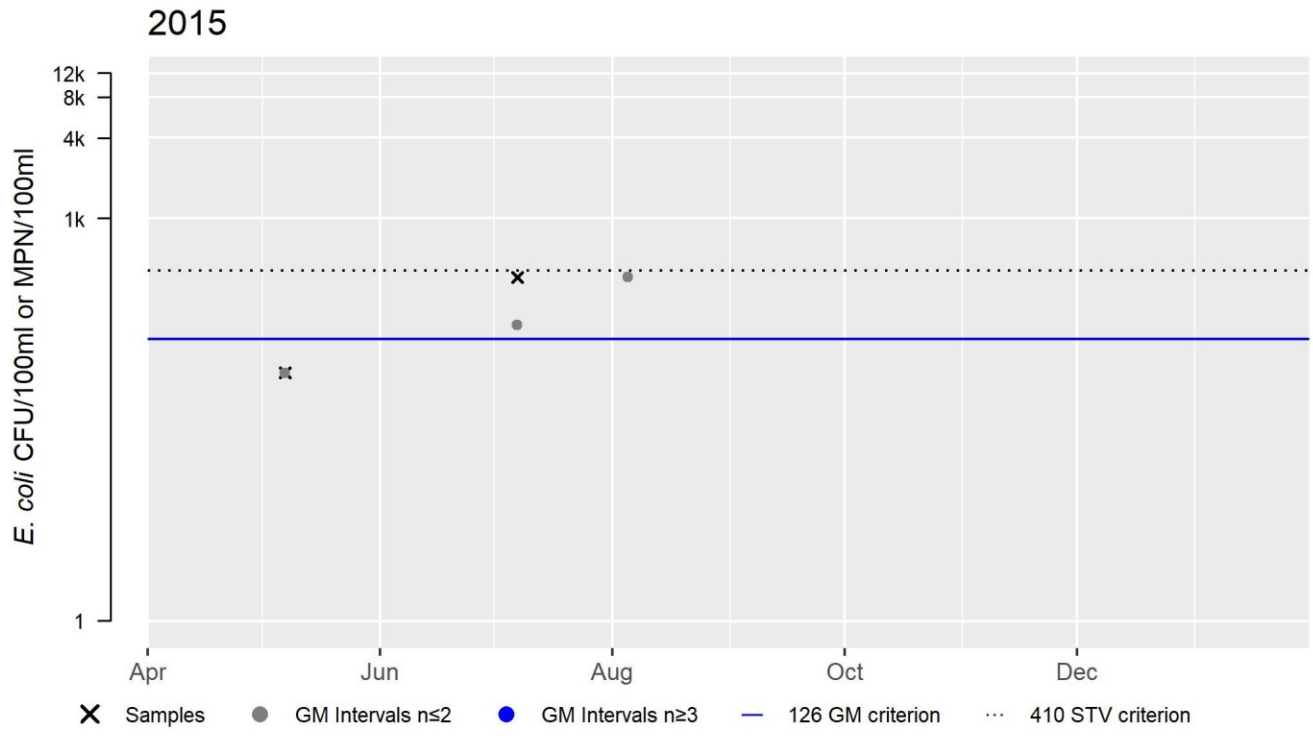
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



## W2567 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 161 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

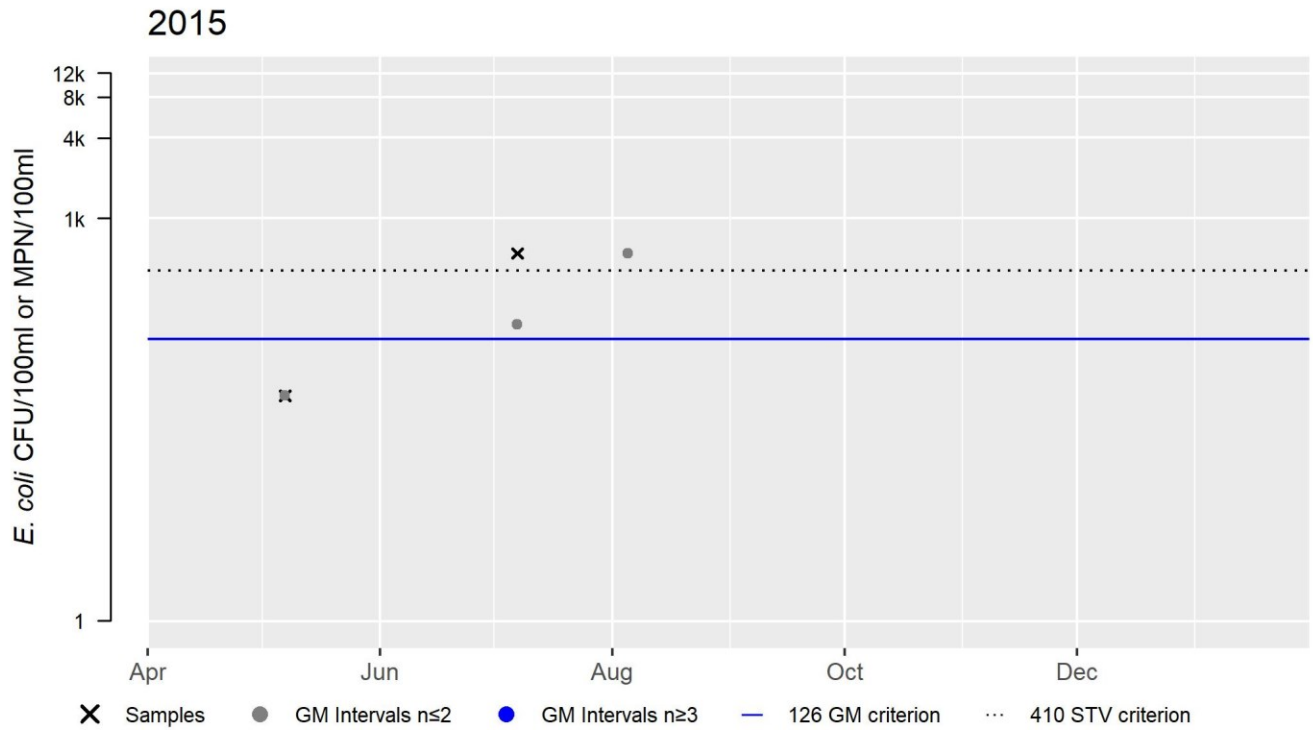
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



W2568 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 162 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

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




**MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019** (MassDEP Undated 1)

| **Summary** |
|---|
| Prior to 2011, BST work was conducted along the Runnins River AU (MA53-20) and in 1 unnamed tributary; with a max *E. coli* count of >2,419.6MPN at Arcade Ave. Additional BST work was conducted between 2012-2015, at 11 sites along Runnins River and in 1 unnamed tributary, with a max *E. coli* count of 8,664MPN. Despite the identification of hotspot areas (in particular the Arcade Ave/Ledge Rd area); human marker analysis at Ledge Rd in 2015, indicated "none", for evidence of a human source. No correctable source was ever found. |

## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|
| Fully Supporting | YES |
| **2022 Use Attainment Summary** | |

*E. coli* bacteria sample were collected by MassDEP staff along this Runnins River AU (MA53-20) at the following sampling stations (data years) as part of either Bacteria Source Tracking (BST) projects or as part of the MAP2 sampling project: MassDEP 1 to 5 times per year – Greenwood Avenue (W2442) (2013); ~ 700 feet upstream Ledge Road (W2449) (2013); ~370 feet upstream Ledge Road (W2505) (2014-2015); ~260 feet upstream Ledge Road (W2568) (2015); ~150 feet upstream Ledge Road (W2567) (2015); Ledge Road (W2441) (2013-2015); Arcade Avenue (W1955) (2013) & ~50 feet downstream Arcade Avenue, Seekonk (W2408) (2013). The BST work was conducted between 2012 & 2015 with the following notes reported: "Despite the identification of hotspot areas (the Arcade Ave/Ledge Rd area), human marker analysis at Ledge Rd in 2015, indicated 'none', for evidence of a human source. No correctable source was ever found." While too limited bacteria samples were collected at the BST sites to assess the Secondary Contact Recreational Use for this AU according to the CALM "Use Attainment Impairment Decision Schema", data analysis of samples collected downstream of Arcade Ave (W2408) indicated 0% of intervals had GMs >630 cfu/100ml, no samples exceeded the 1,260 cfu/100ml STV, with a seasonal GM of 108 cfu/100ml. Bacteria counts further upstream at Ledge Rd (W2441) significantly exceeded the STV once in 2013 and once in 2014. Since the *E. coli* concentrations in the river were below the use attainment impairment thresholds for the single year moderate frequency dataset downstream of Arcade Ave (W2408) , the Secondary Contact Recreational Use for this Runnins River AU (MA53-20) is assessed as Fully Supporting. An Alert is being identified however due to the intermittently elevated *E. coli* counts at Ledge Rd (W2441) in 2013 and 2014.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W1955 | MassDEP | Water Quality | Runnins River | [Arcade Avenue, Seekonk] | 41.830667 | -71.329713 |
| W2408 | MassDEP | Water Quality | Runnins River | [approximately 50 feet downstream/southwest from Arcade Avenue, Seekonk (upstream of unnamed tributary on northwestern bank)] | 41.830588 | -71.329937 |
| W2441 | MassDEP | Water Quality | Runnins River | [Ledge Road, Seekonk] | 41.836247 | -71.323196 |
| W2442 | MassDEP | Water Quality | Runnins River | [Greenwood Avenue, Seekonk] | 41.835710 | -71.316507 |
| W2449 | MassDEP | Water Quality | Runnins River | [approximately 700 feet upstream/northeast of Ledge Road, Seekonk (upstream of private road crossing)] | 41.835765 | -71.321287 |
| W2505 | MassDEP | Water Quality | Runnins River | [approximately 370 feet upstream/east of Ledge Road, Seekonk] | 41.836297 | -71.322141 |
| W2567 | MassDEP | Water Quality | Runnins River | [approximately 150 feet upstream/north of Ledge Road, Seekonk] | 41.836467 | -71.322721 |
| W2568 | MassDEP | Water Quality | Runnins River | [approximately 260 feet upstream/north of Ledge Road, Seekonk] | 41.836486 | -71.322396 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (MassDEP Undated 8) (MassDEP Undated 5)

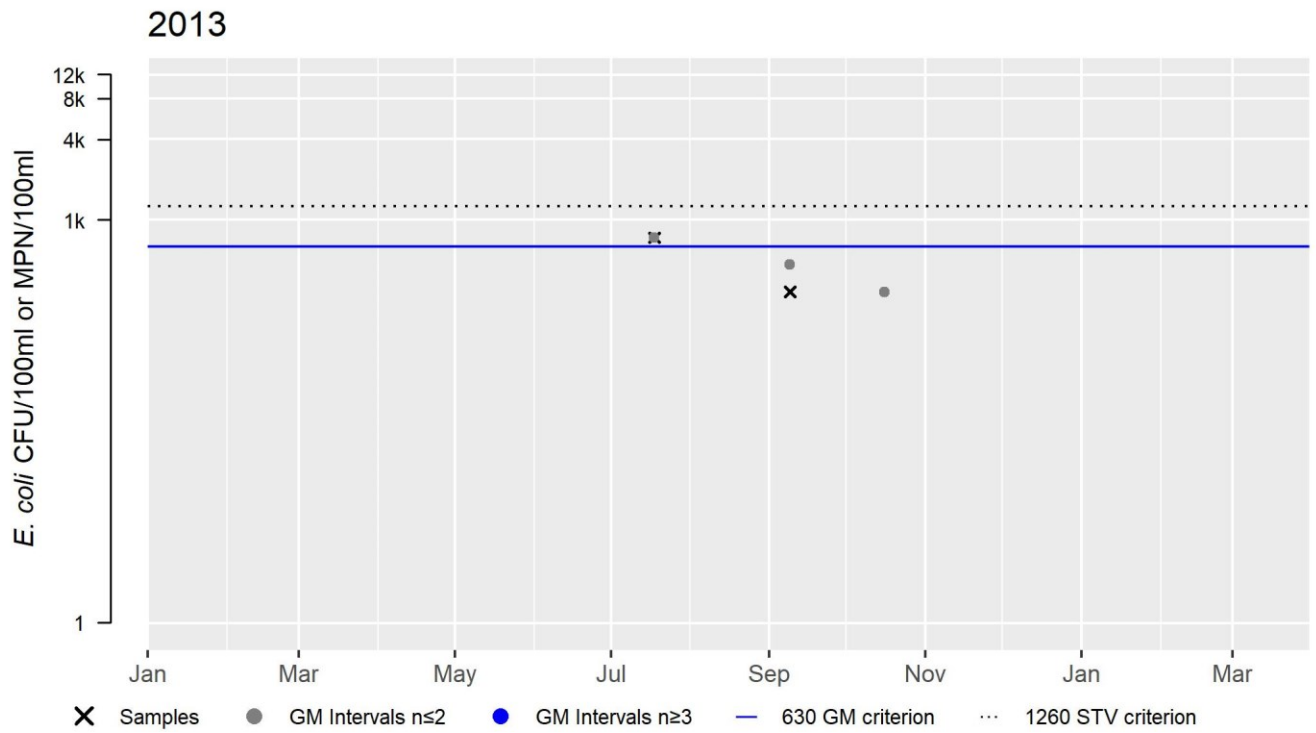
[Result units are CFU/100ml or MPN/100ml]

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| W1955 | MassDEP | E. coli | 07/18/13 | 09/09/13 | 2 | 291 | 738 | 463 |
| W2408 | MassDEP | E. coli | 05/16/13 | 09/11/13 | 5 | 30 | 417 | 108 |
| W2441 | MassDEP | E. coli | 09/09/13 | 10/22/13 | 2 | 816 | 2419.6 | 1405 |
| W2441 | MassDEP | E. coli | 06/09/14 | 07/31/14 | 2 | 199 | 7270 | 1203 |
| W2441 | MassDEP | E. coli | 05/07/15 | 07/07/15 | 2 | 41 | 178 | 85 |
| W2442 | MassDEP | E. coli | 09/09/13 | 10/22/13 | 2 | 7 | 166 | 34 |
| W2449 | MassDEP | E. coli | 10/22/13 | 11/06/13 | 2 | 14 | 39 | 23 |
| W2505 | MassDEP | E. coli | 06/09/14 | 07/31/14 | 2 | 185 | 2419.6 | 669 |
| W2505 | MassDEP | E. coli | 05/07/15 | 07/07/15 | 2 | 68 | 261 | 133 |
| W2567 | MassDEP | E. coli | 05/07/15 | 07/07/15 | 2 | 71 | 365 | 161 |
| W2568 | MassDEP | E. coli | 05/07/15 | 07/07/15 | 2 | 48 | 548 | 162 |

## W1955 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 463 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

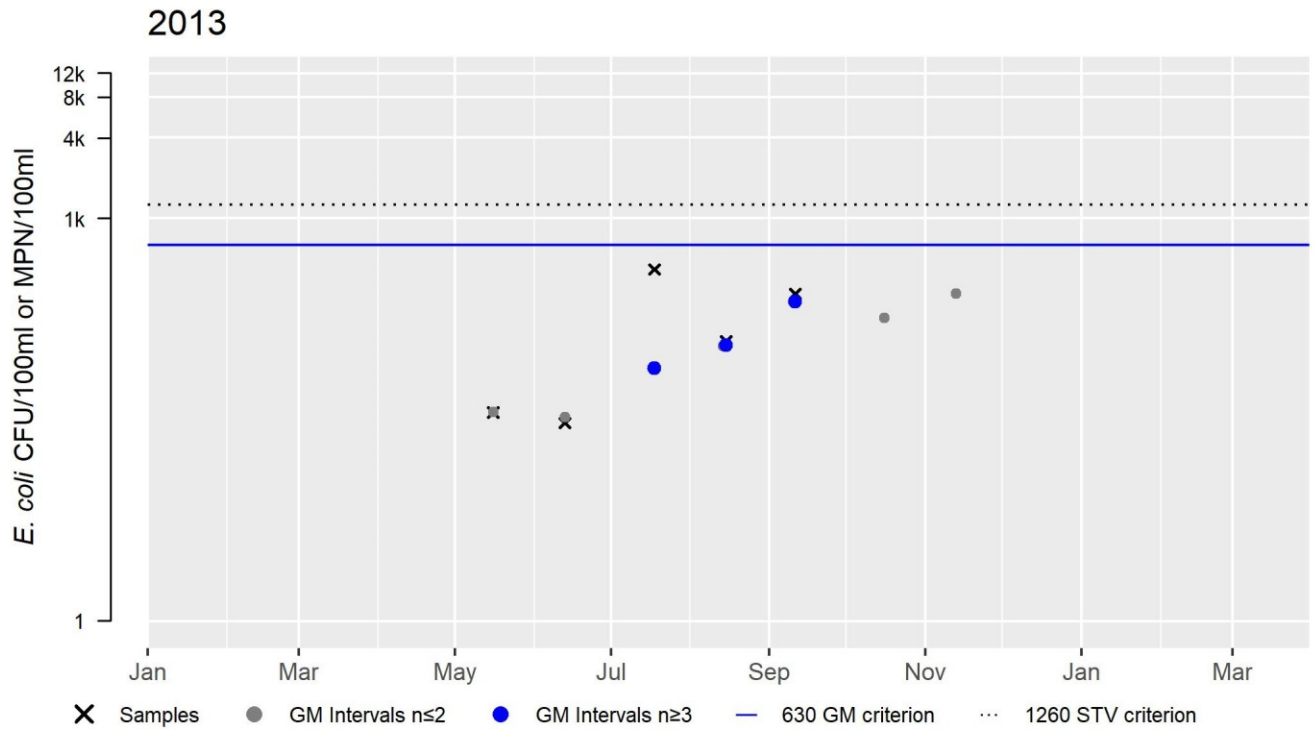
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



## W2408 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 5 |
| SeasGM | 108 |
| #GMI | 3 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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



## W2441 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

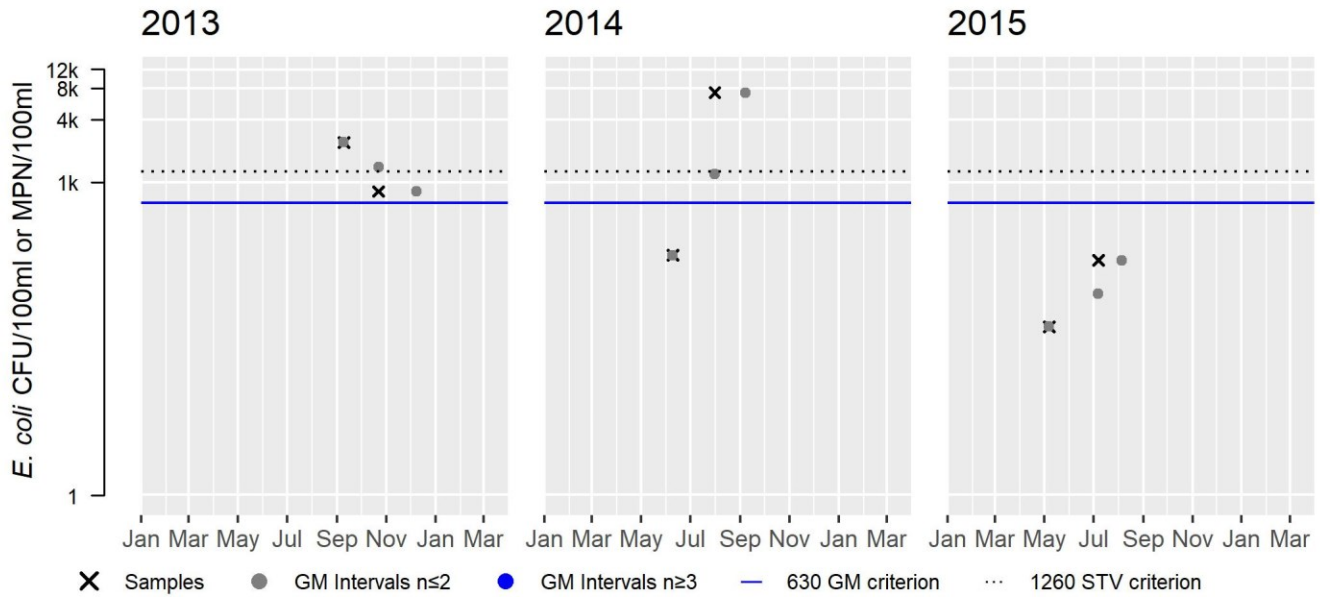
| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 1405 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 1203 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 85 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

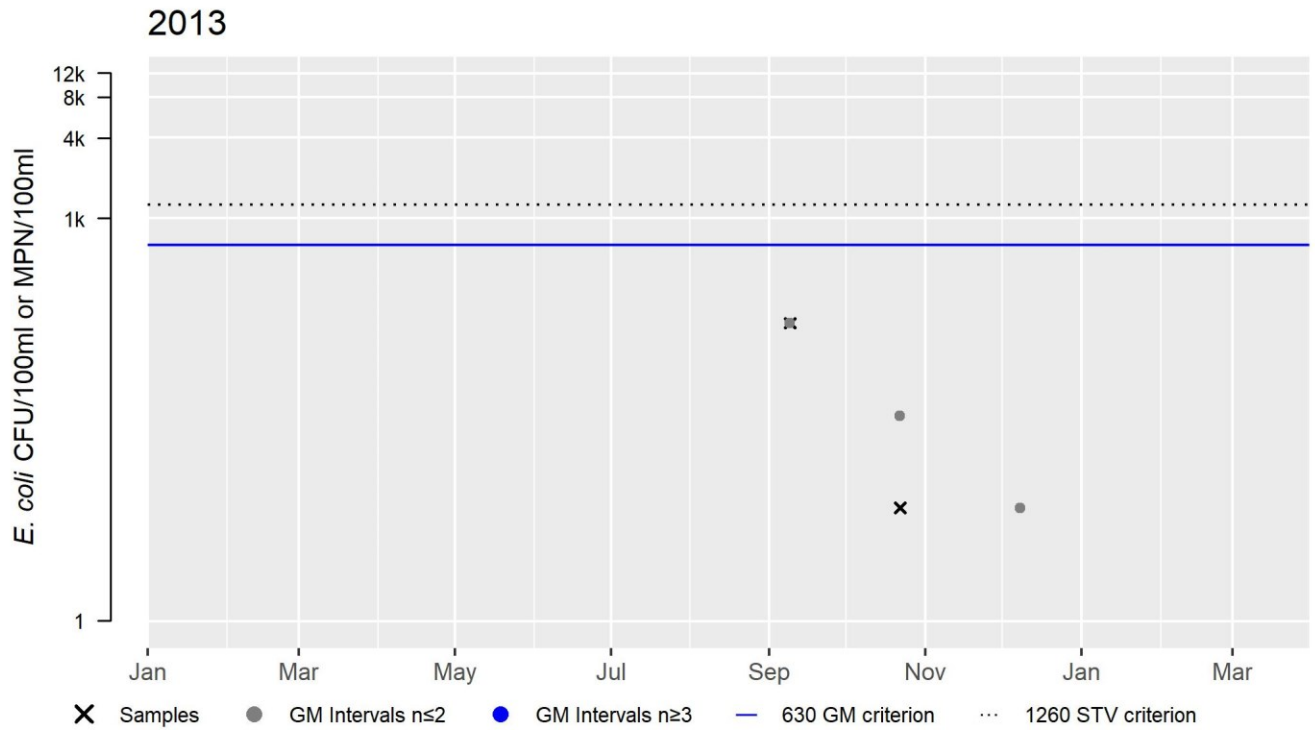
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



## W2442 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 34 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

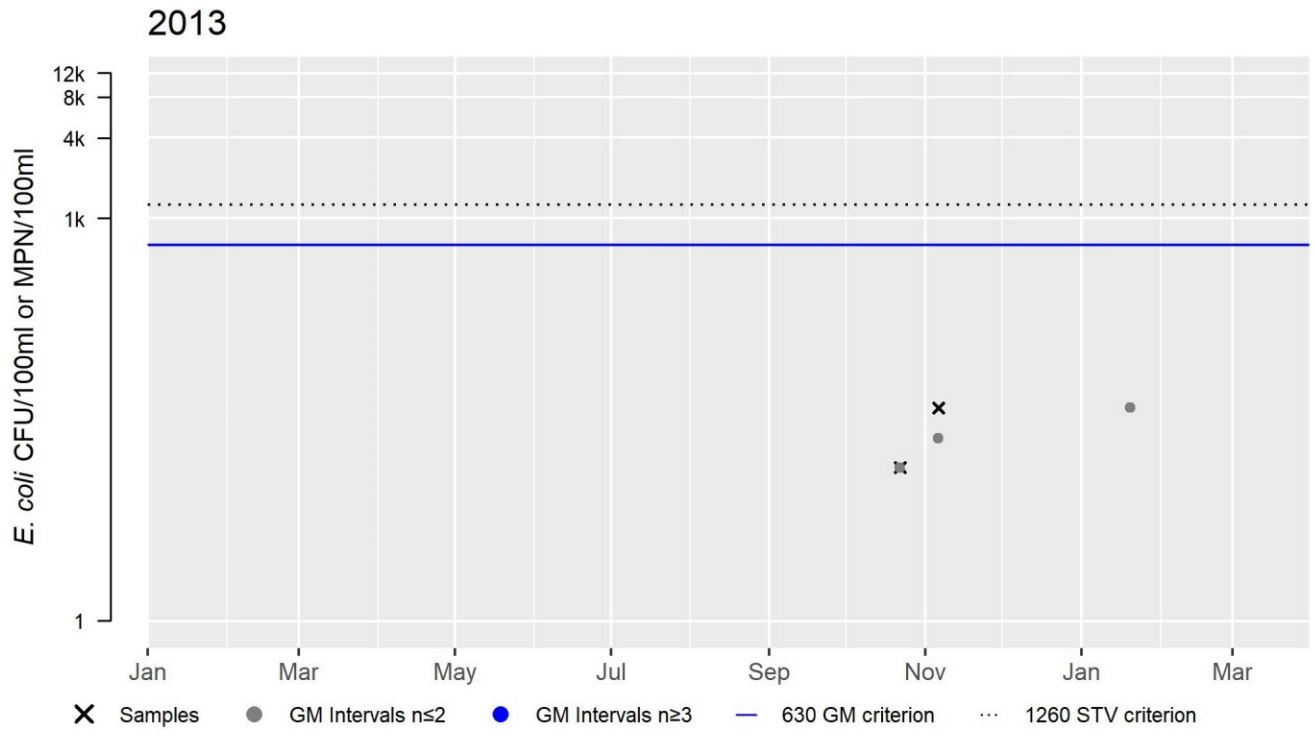
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



## W2449 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 23 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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



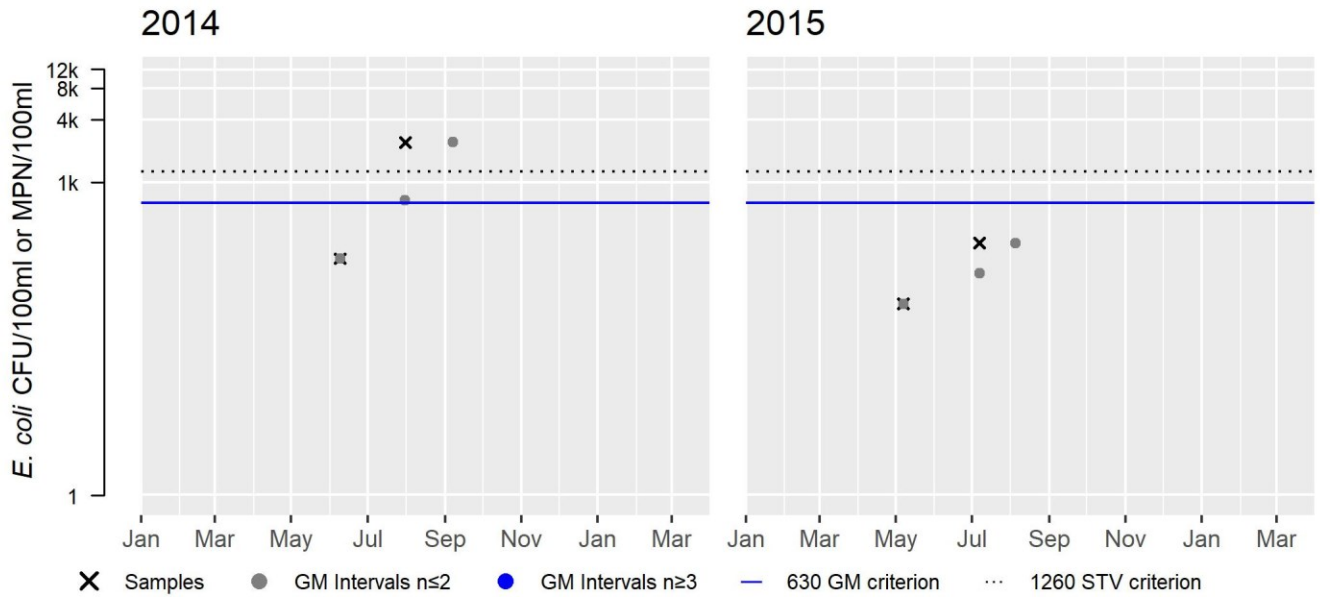
## W2505 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 669 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 133 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

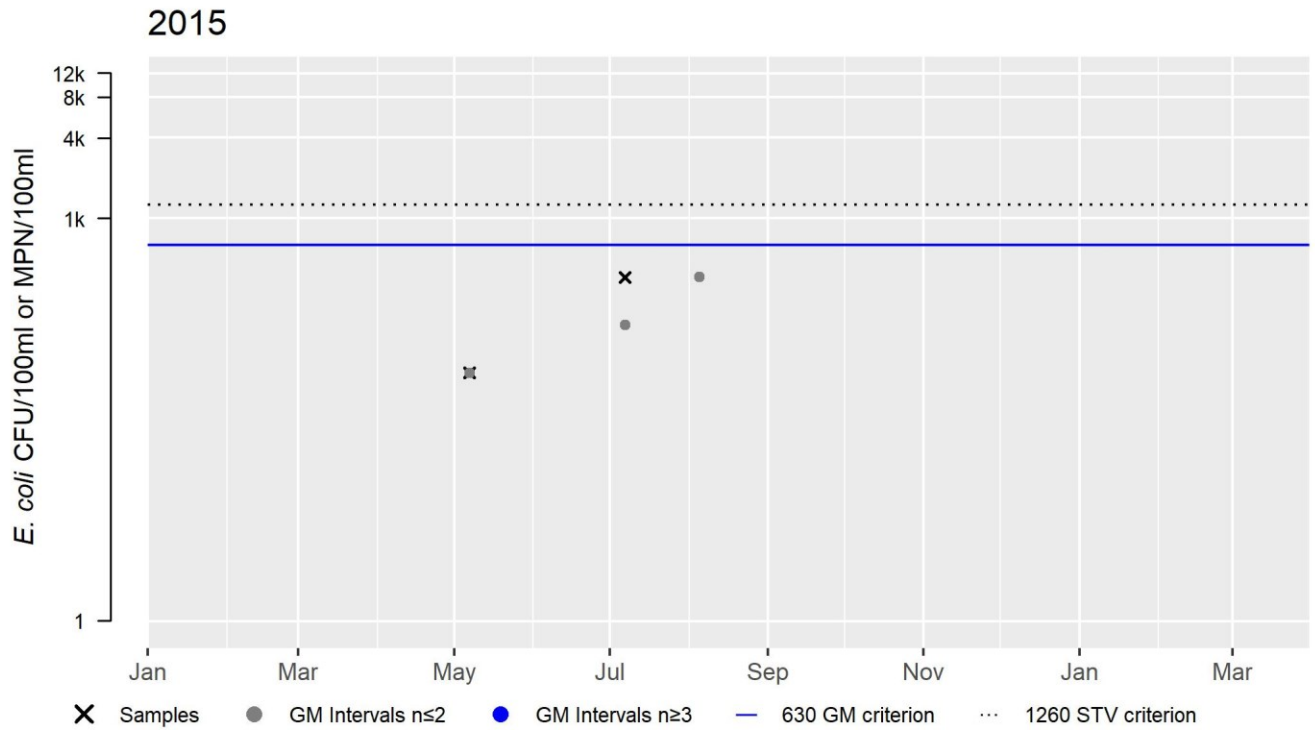
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



## W2567 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 161 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

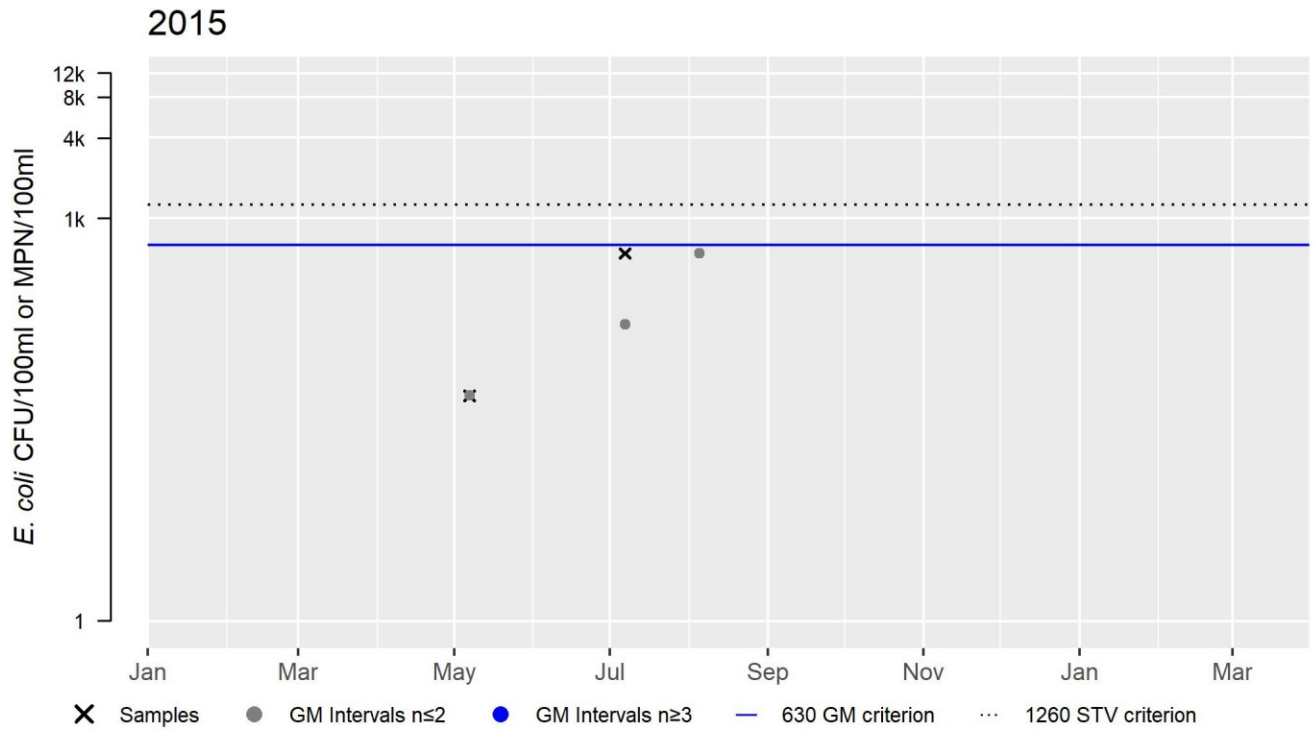
*Abbreviations: Samples = #samples; SeasGM = Seasonal Geometric Mean (GM); #GMI = number GM Intervals; #GMI Ex = number GMI Exeedances; %GMI Ex = percent GMI Exeedances; n>STV = #samples>Statistical Threshold Value (STV); %n>STV = percent samples>STV*



## W2568 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 162 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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



# Shad Factory Pond (MA53005)

| | |
|---|---|
| **Location:** | Rehoboth (formerly part of 2014 segment: Palmer River MA53-04). |
| **AU Type:** | FRESHWATER LAKE |
| **AU Size:** | 31 ACRES |
| **Classification/Qualifier:** | B: TWS, PWS |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 5 | 5 | (Dewatering*) | | Unchanged |
| 5 | 5 | Fecal Coliform | 35086 | Unchanged |
| 5 | 5 | Nutrient/Eutrophication Biological Indicators | | Unchanged |

| Impairment | Source (Confirmed Y/N) | Fish, other Aquatic Life and Wildlife | Fish Consumption | Aesthetic | Primary Contact Recreation | Secondary Contact Recreation |
|---|---|---|---|---|---|---|
| (Dewatering*) | Source Unknown (N) | X | | | | |
| Fecal Coliform | Agriculture (Y) | | | | X | |
| Fecal Coliform | Discharges from Municipal Separate Storm Sewer Systems (MS4) (Y) | | | | X | |
| Fecal Coliform | Waterfowl (N) | | | | X | |
| Nutrient/Eutrophication Biological Indicators | Source Unknown (N) | X | | | | |

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |
| DMF biologists note one potential barrier providing adequate passage to diadromous fish at the boundary between the Shad Factory Pond and downstream Palmer River AU (MA53-05). The Shad Factory Pond Dam (NATID# MA00787) (with existing fishway-new in 2006) was given a passage score of "2" on a 0-10 scale, indicating that the dam is only a minor obstruction to the passage of the targeted fish species, river herring and American shad. The population score was noted to be "4". It was further noted by DMF that there are ongoing water management concerns in this area and that there has been recent interest in dam removal. A passage score of 2 is supportive of the Aquatic Life Use. No other monitoring data were collected so the Aquatic Life Use for Shad Factory Pond will continue to be assessed as Not Supporting with the impairments for “Dewatering” and “Nutrient Eutrophication Biological Indicators” being carried forward. | |

#### *Biological Monitoring Information*

### Habitat and Flow Data (anthropogenic alterations)

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

| Assessment Summary |
|---|
| DMF biologists note one potential barrier providing adequate passage to diadromous fish at the boundary between the Shad Factory Pond and downstream Palmer River AU (MA53-05). The Shad Factory Pond Dam (NATID# MA00787) (with existing fishway-new in 2006) was given a passage score of "2" on a 0-10 scale, indicating that the dam is only a minor obstruction to the passage of the targeted fish species, river herring and American shad. The population score was noted to be "4". It was further noted by DMF that there are ongoing water management concerns in this area and that there has been recent interest in dam removal. |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH; therefore, the Fish Consumption Use for Shad Factory Pond (MA53005) is Not Assessed. | |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No data are available to assess the status of the Aesthetic Use for Shad Factory Pond (MA53005), so it is Not Assessed. | |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |
| No recent data are available to assess the status of the Primary Contact Recreation Use for Shad Factory Pond (MA53005), so it will continue to be assessed as Not Supporting with the Fecal Coliform impairment being carried forward. | |

## Secondary Contact Recreation

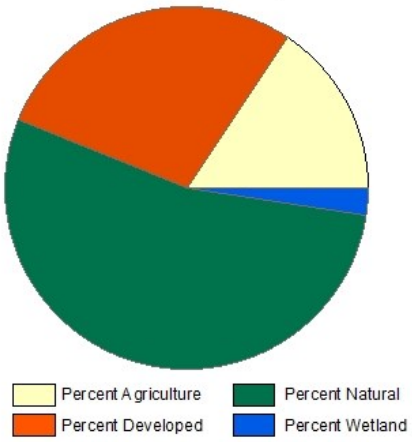
| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No data are available to assess the status of the Secondary Contact Recreation Use for Shad Factory Pond (MA53005), so it is Not Assessed. | |

# Torrey Creek (MA53-14)

| | |
|---|---|
| **Location:** | Headwaters in wetland east of Benson Avenue, Seekonk to just downstream of Barney Avenue, Rehoboth (includes culverted section [approximately 1200 feet] near Seekonk Speedway, Seekonk) (prior to 2010 this segment included estuarine portion). |
| **AU Type:** | RIVER |
| **AU Size:** | 2.1 MILES |
| **Classification/Qualifier:** | B |

**Torrey Creek - MA53-14**

Watershed Area: 2.11 square miles




| Landuse Type | Entire Basin | 5km Radius Proximal Subbasin | 100m Stream Buffer | Proximal Stream Buffer |
|---|---|---|---|---|
| Land Use Area (square miles) | 2.11 | 2.11 | 0.92 | 0.92 |
| Agriculture | 15.6% | 15.6% | 14.2% | 14.2% |
| Developed | 28.3% | 28.3% | 21.1% | 21.1% |
| Natural | 53.8% | 53.8% | 61.7% | 61.7% |
| Wetland | 2.4% | 2.4% | 2.9% | 2.9% |
| Impervious Cover | 13.3% | | | |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 4a | 5 | (Alteration in Stream-side or Littoral Vegetative Covers*) | | Unchanged |
| 4a | 5 | (Habitat Assessment*) | | Unchanged |
| 4a | 5 | Enterococcus | | Added |
| 4a | 5 | Escherichia Coli (E. Coli) | 35088 | Unchanged |

| Impairment | Source (Confirmed Y/N) | Fish, other Aquatic Life and Wildlife | Fish Consumption | Aesthetic | Primary Contact Recreation | Secondary Contact Recreation |
|---|---|---|---|---|---|---|
| (Alteration in Stream-side or Littoral Vegetative Covers*) | Habitat Modification - other than Hydromodification (Y) | X | | | | |
| (Habitat Assessment*) | Habitat Modification - other than Hydromodification (Y) | X | | | | |
| Enterococcus | Agriculture (Y) | | | | X | |

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

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | YES |
| **2022 Use Attainment Summary** | |
| EPA conducted discrete water quality monitoring in the middle and at the downstream end of this Torrey Creek AU (MA53-14) as follows: on Seekonk Speedway property, Seekonk (EPA_TC05) and at an access road off Barney Ave (EPA_TC07), Rehoboth (both to a limited extent in 2012 & 2013) and then more often 2016-2019 (typically monthly) at EPA_TC07. Most data were indicative of good water quality: pH ranged from 6.2-7.0SU (n=6) (with 2 out of 6 measurements falling below 6.5SU); maximum temperature 24.2$^{o}$C (n=16); minimum DO 5.1mg/L, with a max DO% saturation of 89.5% (n=6). Specific conductance was low at EPA_TC05 (n=3) (max 367 µS/cm) with no chloride toxicity indicated; however, at EPA_TC07 specific conductance sometimes appeared high, with a max of 23,374µS/cm (n=35). The high measurements are likely a result of the intermittent salt-water intrusion observed at EPA_TC07, in combination with the observed lack of freshwater when the brook dried out during the summer months (chloride tox calculations not applicable). Total ammonia nitrogen ranged 0.07-0.86mg/L (n=9), with no toxicity estimated. The seasonal average for total phosphorus was low, ranging 0.05-0.06 mg/L (typically n=5). The seasonal average Total Nitrogen concentration (measured at EPA_TC07) was consistent at 0.9mg/L (typically n=5). In estuarine systems, TN seasonal averages >0.5mg/L can be indicative of degraded overall health; however, this AU is not fully estuarine despite what conditions the downstream end of the AU might experience (i.e., some tidal incursion).<br>The Aquatic Life Use of Torrey Creek (MA53-14) will continue to be assessed as Not Supporting with the habitat assessment and alteration in stream-side or littoral vegetative covers impairments being carried forward (the creek is culverted at the upstream end of the AU -- near the Seekonk Speedway). An alert is also being identified for the elevated Total Nitrogen concentrations in the creek near Barney Ave and its potential impact on the downstream estuarine portion of Torrey Creek and ultimately the Palmer River. | |

#### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W2447 | MassDEP | Water Quality | Torrey Creek | [just downstream of culvert southeast of Barney Avenue, Rehoboth] | 41.780692 | -71.288306 |

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_TC05 | Environmental Protection Agency | Water Quality | Torrey Creek | On Seekonk Speedway property, Seekonk | 41.785509 | -71.298848 |
| EPA_TC07 | Environmental Protection Agency | Water Quality | Torrey Creek | Torrey Creek @ access rd off Barney Ave, approximately 350ft SSW from RT.195, Rehoboth | 41.780662 | -71.288315 |

## *Biological Monitoring Information*

### Habitat and Flow Data (anthropogenic alterations)

**EPA Discrete Total Suspended Solids Data (2016-2019).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | TSS Count | TSS Max (mg/L) | TSS Avg (mg/L) | TSS Count >25 |
|---|---|---|---|---|---|---|
| EPA_TC07 | 04/19/16 | 11/09/16 | 8 | 18 | 6.2 | 0 |
| EPA_TC07 | 04/20/17 | 11/14/17 | 8 | 3.3 | 2.6 | 0 |
| EPA_TC07 | 04/24/18 | 11/05/18 | 8 | 3.8 | 2.9 | 0 |
| EPA_TC07 | 05/13/19 | 11/06/19 | 7 | 120 | 27.8 | 2 |

## *Physico-chemical Water Quality Information*

### DO, pH, Temperature

**EPA Freshwater Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| EPA_TC05 | 10/23/12 | 10/23/12 | 1 | 8.6 | 8.6 | 0 | 0 | 0 |
| EPA_TC05 | 07/09/13 | 09/25/13 | 2 | 6.8 | 7.0 | 0 | 0 | 0 |
| EPA_TC07 | 10/23/12 | 10/23/12 | 1 | 9.6 | 9.6 | 0 | 0 | 0 |
| EPA_TC07 | 07/09/13 | 09/25/13 | 2 | 5.1 | 7.3 | 0 | 0 | 0 |

**EPA Freshwater Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA_TC05 | 10/23/12 | 10/23/12 | 1 | 0 | 14.2 | 14.2 | 0 | 0 | 0 | 0 |

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA_TC05 | 07/09/13 | 09/25/13 | 2 | 1 | 20.9 | 18.5 | 1 | 0 | 0 | 0 |
| EPA_TC07 | 10/23/12 | 10/23/12 | 1 | 0 | 11.1 | 11.1 | 0 | 0 | 0 | 0 |
| EPA_TC07 | 07/09/13 | 09/25/13 | 2 | 1 | 23.4 | 17.7 | 1 | 1 | 0 | 0 |
| EPA_TC07 | 04/19/16 | 11/09/16 | 8 | 4 | 24.2 | 14.8 | 1 | 1 | 0 | 0 |
| EPA_TC07 | 04/20/17 | 11/14/17 | 8 | 4 | 21.0 | 15.6 | 2 | 0 | 0 | 0 |
| EPA_TC07 | 04/24/18 | 11/05/18 | 8 | 3 | 23.2 | 14.6 | 1 | 1 | 0 | 0 |
| EPA_TC07 | 04/29/19 | 11/06/19 | 8 | 3 | 21.6 | 14.7 | 2 | 0 | 0 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_TC05 | 10/23/12 | 10/23/12 | 1 | 6.4 | 6.4 | 1 | 0 |
| EPA_TC05 | 07/09/13 | 09/25/13 | 2 | 6.2 | 6.6 | 1 | 0 |
| EPA_TC07 | 10/23/12 | 10/23/12 | 1 | 7.0 | 7.0 | 0 | 0 |
| EPA_TC07 | 07/09/13 | 09/25/13 | 2 | 6.8 | 6.8 | 0 | 0 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**MassDEP Nutrient Enrichment Indicator Data (2011-2018).** (MassDEP Undated 8) (MassDEP Undated 5)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | Delta DO Max (mg/L) | Delta DO Avg (mg/L) | DO Sat Max (%) | pH Max (SU) | Count Algal Obsv. | Dense/V. Dense Film/Fila. Algae |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W2447 | 2013 | -- | -- | -- | -- | -- | -- | -- | -- | 2 | 0 |
| W2447 | 2015 | -- | -- | -- | -- | -- | -- | -- | -- | 3 | 0 |
| W2447 | 2016 | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 0 |

**EPA Freshwater Nutrient Enrichment Indicator Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | DO Sat Max (%) | pH Max (SU) |
|---|---|---|---|---|---|---|---|
| EPA_TC05 | 2012 | -- | -- | -- | -- | 83.0 | 6.4 |
| EPA_TC05 | 2013 | -- | -- | -- | -- | 77.8 | 6.6 |
| EPA_TC07 | 2012 | -- | -- | -- | -- | 87.5 | 7.0 |
| EPA_TC07 | 2013 | -- | -- | -- | -- | 89.5 | 6.8 |
| EPA_TC07 | 2016 | 5 | 0.034 | 0.080 | 0.047 | -- | -- |
| EPA_TC07 | 2017 | 5 | 0.023 | 0.071 | 0.044 | -- | -- |
| EPA_TC07 | 2018 | 5 | 0.031 | 0.072 | 0.048 | -- | -- |
| EPA_TC07 | 2019 | 5 | 0.005 | 0.088 | 0.059 | -- | -- |

**EPA Summer Seasonal Total Nitrogen Data (2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Total nitrogen data collected May-Sept]

| Station Code | Start Date | End Date | Seasonal TN Count | Seasonal TN Min (mg/L) | Seasonal TN Max (mg/L) | Seasonal TN Avg (mg/L) |
|---|---|---|---|---|---|---|
| EPA_TC07 | 05/17/16 | 09/13/16 | 5 | 0.5 | 1.2 | 0.9 |
| EPA_TC07 | 05/31/17 | 09/14/17 | 5 | 0.6 | 1.2 | 0.9 |
| EPA_TC07 | 05/09/18 | 09/19/18 | 5 | 0.7 | 1.2 | 0.9 |
| EPA_TC07 | 05/13/19 | 09/24/19 | 5 | 0.7 | 1.2 | 0.9 |

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

**EPA Freshwater Total Ammonia Nitrogen (TAN) Data (2017 & 2019).** (EPA 2020) (MassDEP Undated 3)

[Toxicity evaluations made using site- and date-specific temperature plus site-specific max pH measurements from 2012 & 2013; TAN= $NH3 + NH_4^+$]

| Station Code | Start Date | End Date | TAN Count | TAN Min (mg/L) | TAN Max (mg/L) | TAN Avg (mg/L) | Count TAN >Chronic | Count TAN >Acute |
|---|---|---|---|---|---|---|---|---|
| EPA_TC07 | 11/14/17 | 11/14/17 | 1 | 0.86 | 0.86 | 0.86 | 0 | 0 |
| EPA_TC07 | 04/29/19 | 11/06/19 | 8 | 0.07 | 0.21 | 0.11 | 0 | 0 |

**EPA Discrete Specific Conductance Data (2012-2013, 2016-2019) Compared to Estimated Chloride Criteria.** (EPA 2020) (MassDEP Undated 3)**.**

[Chloride tox calculations not applicable due to intermittent salt-water incursion at EPA_TC07.]

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_TC05 | 10/23/12 | 10/23/12 | 1 | 283 | 283 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_TC05 | 07/09/13 | 09/25/13 | 2 | 331 | 367 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_TC07 | 10/23/12 | 10/23/12 | 1 | 817 | 817 | NA | NA | NA | NA | NA | NA |
| EPA_TC07 | 07/09/13 | 09/25/13 | 2 | 547 | 621 | NA | NA | NA | NA | NA | NA |
| EPA_TC07 | 04/19/16 | 11/09/16 | 8 | 383 | 23374 | NA | NA | NA | NA | NA | NA |
| EPA_TC07 | 04/20/17 | 11/14/17 | 8 | 367 | 3394 | NA | NA | NA | NA | NA | NA |
| EPA_TC07 | 04/24/18 | 11/05/18 | 8 | 289 | 884 | NA | NA | NA | NA | NA | NA |
| EPA_TC07 | 04/29/19 | 11/06/19 | 8 | 270 | 809 | NA | NA | NA | NA | NA | NA |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH; therefore, the Fish Consumption Use for Torrey Creek (MA53-14) is Not Assessed. | |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Fully Supporting | NO |
| **2022 Use Attainment Summary** | |

MassDEP staff surveyed this Torrey Creek AU (MA53-14) just downstream of culvert southeast of Barney Avenue, Rehoboth (W2447) during the summers of 2013, 2015, and 2016 (n=7). There were generally no objectionable conditions (i.e., odors, deposits, growths, or turbidity) were observed during any of the surveys.
The Aesthetics Use for this Torrey Creek AU (MA53-14) is assessed as Fully Supporting based on the lack of any objectionable conditions documented by MassDEP staff during the summers of 2013, 2015, and 2016.

## *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| W2447 | MassDEP | Water Quality | Torrey Creek | [just downstream of culvert southeast of Barney Avenue, Rehoboth] | 41.780692 | -71.288306 |

## *Aesthetic Observations*

**Aesthetics Summary Statements for MassDEP Stations (2011-2018)** (MassDEP Undated 5)

| Station Code | Waterbody | Data Year | Field Sheet Count | Aesthetics Summary Statement |
|---|---|---|---|---|
| W2447 | Torrey Creek | 2013 | 3 | MassDEP aesthetics observations for station W2447 on Torrey Creek can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2013. |
| W2447 | Torrey Creek | 2015 | 3 | MassDEP aesthetics observations for station W2447 on Torrey Creek can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2015. |
| W2447 | Torrey Creek | 2016 | 1 | MassDEP aesthetics observations for station W2447 on Torrey Creek can be summarized as follows: there were generally no noted objectionable conditions (odors, deposits, growths, or turbidity) recorded by DEP field sampling crews during summer 2016. However, there is insufficient information to assess the Aesthetics Use since data were limited (n=1). |

**Observations of Filamentous/Film Algae at MassDEP Stations (2011-2018)** (MassDEP Undated 8) (MassDEP Undated 5)

| Station Code | Data Year | Field Sheet Count | Field Sheet Count w/ Film & Filamentous Algae Observations | Dense/ Very Dense Film/ Filamentous Algae |
|---|---|---|---|---|
| W2447 | 2013 | 3 | 2 | 0 |
| W2447 | 2015 | 3 | 3 | 0 |
| W2447 | 2016 | 1 | 1 | 0 |

**MassDEP Aesthetics Observations (2011-2018)** (MassDEP Undated 8)

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W2447 | Torrey Creek | 2013 | Color | None | 2 | 3 |
| W2447 | Torrey Creek | 2013 | Color | NR | 1 | 3 |
| W2447 | Torrey Creek | 2013 | Objectionable Deposits | Not Applicable (N/A) | 3 | 3 |
| W2447 | Torrey Creek | 2013 | Odor | None | 2 | 3 |

| Station Code | Waterbody | Data Year | Parameter | Result | Result Count | Total Field Sheet Count |
|---|---|---|---|---|---|---|
| W2447 | Torrey Creek | 2013 | Odor | NR | 1 | 3 |
| W2447 | Torrey Creek | 2013 | Scum | Not Applicable (N/A) | 3 | 3 |
| W2447 | Torrey Creek | 2013 | Turbidity | Moderately Turbid | 2 | 3 |
| W2447 | Torrey Creek | 2013 | Turbidity | NR | 1 | 3 |
| W2447 | Torrey Creek | 2015 | Color | None | 3 | 3 |
| W2447 | Torrey Creek | 2015 | Objectionable Deposits | Not Applicable (N/A) | 3 | 3 |
| W2447 | Torrey Creek | 2015 | Odor | None | 3 | 3 |
| W2447 | Torrey Creek | 2015 | Scum | Not Applicable (N/A) | 3 | 3 |
| W2447 | Torrey Creek | 2015 | Turbidity | Moderately Turbid | 1 | 3 |
| W2447 | Torrey Creek | 2015 | Turbidity | Slightly Turbid | 2 | 3 |
| W2447 | Torrey Creek | 2016 | Color | None | 1 | 1 |
| W2447 | Torrey Creek | 2016 | Objectionable Deposits | Not Applicable (N/A) | 1 | 1 |
| W2447 | Torrey Creek | 2016 | Odor | None | 1 | 1 |
| W2447 | Torrey Creek | 2016 | Scum | Not Applicable (N/A) | 1 | 1 |
| W2447 | Torrey Creek | 2016 | Turbidity | Slightly Turbid | 1 | 1 |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |

**2022 Use Attainment Summary**

*E. coli* and *Enterococcus* bacteria samples were collected by MassDEP and EPA staff in the middle and at the downstream end of this Torrey Creek AU (MA53-14), at the following sampling stations (data years): EPA 1-2 times per year – on Seekonk Speedway property, Seekonk (EPA_TC05) (2012 & 2013), MassDEP 4-7 times per year – just downstream of culvert southeast of Barney Avenue, Rehoboth (W2447) (2015-2018) and (just a few feet further downstream) EPA 6-7 times per year – @ the access Rd. off Barney Ave, ~350ft SSW from RT.195 (EPA_TC07) (2016-2019). EPA *E. coli* data in the middle and downstream end of the AU (EPA_TC05 and EPA_TC07, respectively) were insufficient to make an assessment (as per the CALM "Use Attainment Impairment Decision Schema"). However, analysis of the DEP *E. coli* data (at the downstream end of the AU) indicated 67-100% of intervals had GMs >126 cfu/100ml in 4 years and 2-3 samples each year exceeded the 410 cfu/100ml STV in 3 of the sample years. Analysis of the EPA *Enterococcus* data (also at the downstream end of the AU at EPA_TC07) indicated 100% of intervals had GMs >35 cfu/100ml in 4 years and 4-5 samples each year exceeded the 130 cfu/100ml STV in 4 of the sample years. MassDEP conducted BST work in 2011 and 2013-2019 at one site along the Torrey Creek AU at Barney Ave, with *E. coli* ranging 15 to 12,033MPN. Agriculture and geese were both observed sources of bacteria in the watershed.

The Primary Contact Recreational Use for this Torrey Creek AU (MA53-14) will continue to be assessed as Not Supporting. The existing impairment for *E. coli* will be carried forward (with an additionally recognized source of "waterfowl" based on observations made by the MassDEP BST program) and an *Enterococcus* impairment is being added.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_TC05 | Environmental Protection Agency | Water Quality | Torrey Creek | On Seekonk Speedway property, Seekonk | 41.785509 | -71.298848 |

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_TC07 | Environmental Protection Agency | Water Quality | Torrey Creek | Torrey Creek @ access rd off Barney Ave, approximately 350ft SSW from RT.195, Rehoboth | 41.780662 | -71.288315 |
| W2447 | MassDEP | Water Quality | Torrey Creek | [just downstream of culvert southeast of Barney Avenue, Rehoboth] | 41.780692 | -71.288306 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3) (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_TC05 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 16 | 16 | 16 |
| EPA_TC05 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 4 | 147 | 24 |
| EPA_TC07 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 85 | 85 | 85 |
| EPA_TC07 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 318 | 953 | 551 |
| EPA_TC07 | Environmental Protection Agency | Enterococci | 07/09/15 | 09/09/15 | 2 | 2480 | 5480 | 3687 |
| EPA_TC07 | Environmental Protection Agency | E. coli | 09/09/15 | 09/09/15 | 1 | 1670 | 1670 | 1670 |
| EPA_TC07 | Environmental Protection Agency | E. coli | 04/19/16 | 04/19/16 | 1 | 187 | 187 | 187 |
| EPA_TC07 | Environmental Protection Agency | Enterococci | 04/19/16 | 10/12/16 | 7 | 16 | 6488 | 218 |
| EPA_TC07 | Environmental Protection Agency | E. coli | 04/20/17 | 05/31/17 | 2 | 21 | 179 | 61 |
| EPA_TC07 | Environmental Protection Agency | Enterococci | 04/20/17 | 10/12/17 | 6 | 41 | 798 | 261 |
| EPA_TC07 | Environmental Protection Agency | Enterococci | 04/24/18 | 10/18/18 | 7 | 10 | 749 | 124 |
| EPA_TC07 | Environmental Protection Agency | Enterococci | 04/29/19 | 10/22/19 | 7 | 31 | 4106 | 248 |
| W2447 | MassDEP | E. coli | 05/06/13 | 09/09/13 | 2 | 248 | 921 | 478 |
| W2447 | MassDEP | Enterococci | 10/01/13 | 10/01/13 | 1 | 610 | 610 | 610 |
| W2447 | MassDEP | E. coli | 07/07/15 | 09/09/15 | 4 | 261 | 1670 | 576 |
| W2447 | MassDEP | E. coli | 05/17/16 | 10/12/16 | 6 | 116 | 12000 | 631 |
| W2447 | MassDEP | E. coli | 05/31/17 | 10/12/17 | 6 | 73 | 866 | 310 |
| W2447 | MassDEP | E. coli | 04/24/18 | 10/18/18 | 7 | 15 | 727 | 155 |

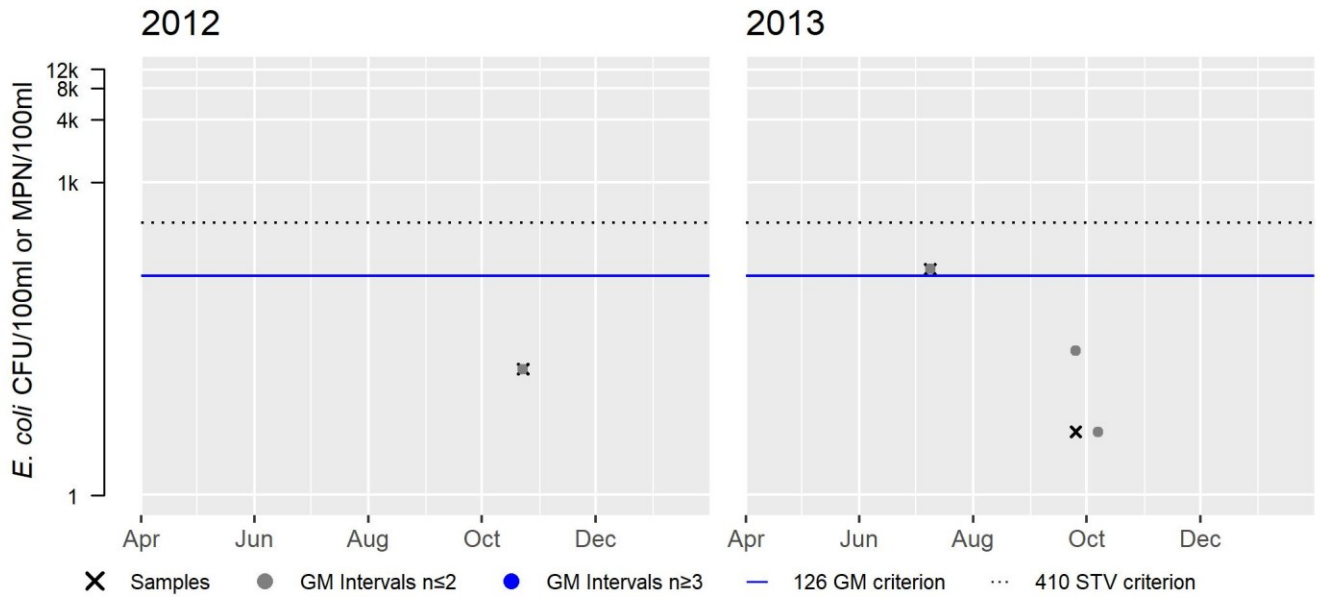
## EPA_TC05 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

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

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 24 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



## EPA_TC07 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 85 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 551 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

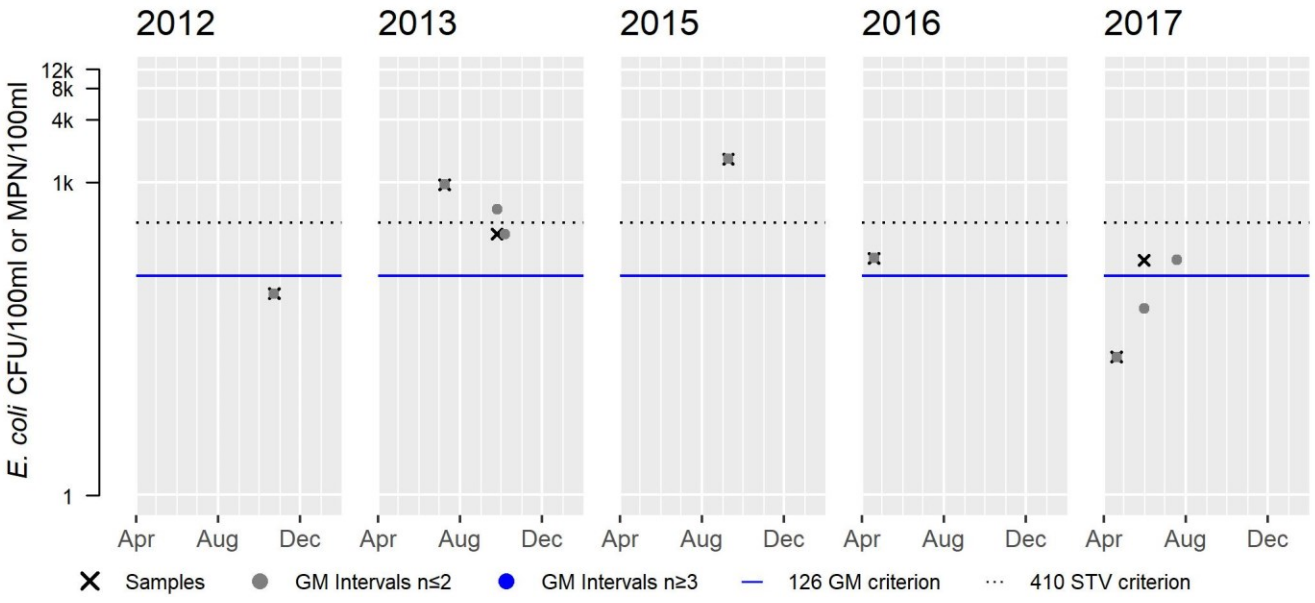
| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 1670 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 187 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 61 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



## EPA_TC07 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 3687 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 2 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 218 |
| #GMI | 6 |
| #GMI Ex | 6 |
| %GMI Ex | 100 |
| n>STV | 4 |
| %n>STV | 57 |

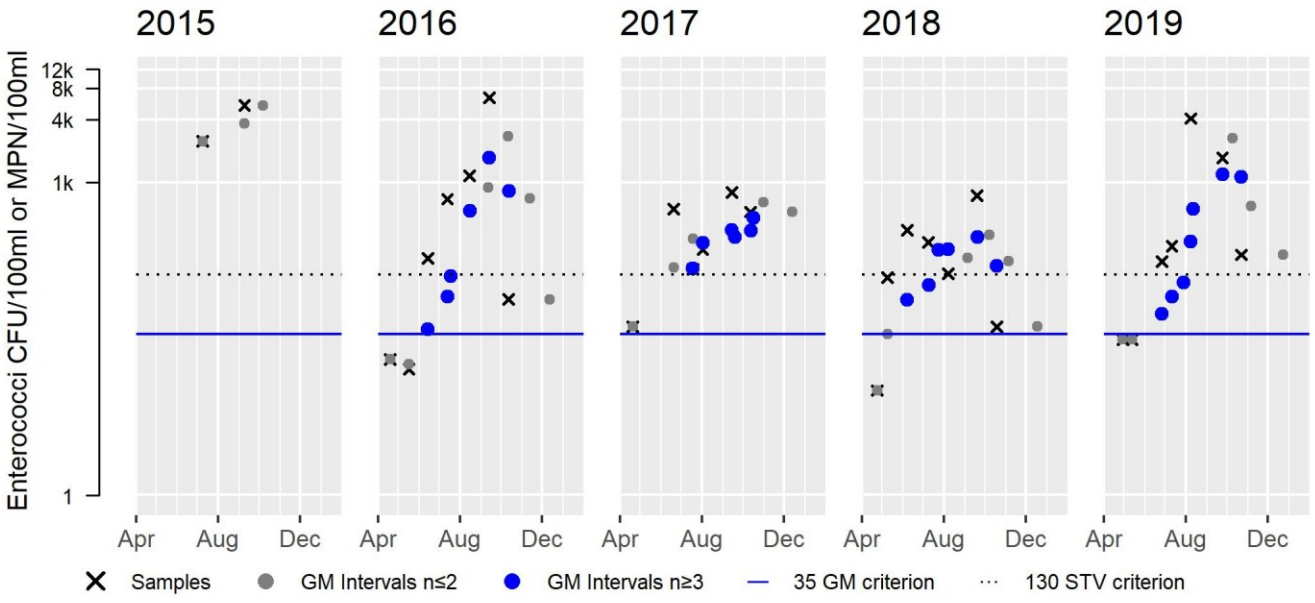
| Var | Res |
|---|---|
| Samples | 6 |
| SeasGM | 261 |
| #GMI | 6 |
| #GMI Ex | 6 |
| %GMI Ex | 100 |
| n>STV | 5 |
| %n>STV | 83 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 124 |
| #GMI | 6 |
| #GMI Ex | 6 |
| %GMI Ex | 100 |
| n>STV | 4 |
| %n>STV | 57 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 248 |
| #GMI | 7 |
| #GMI Ex | 7 |
| %GMI Ex | 100 |
| n>STV | 5 |
| %n>STV | 71 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 100 |



## W2447 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 478 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

| Var | Res |
|---|---|
| Samples | 4 |
| SeasGM | 576 |
| #GMI | 3 |
| #GMI Ex | 3 |
| %GMI Ex | 100 |
| n>STV | 2 |
| %n>STV | 50 |

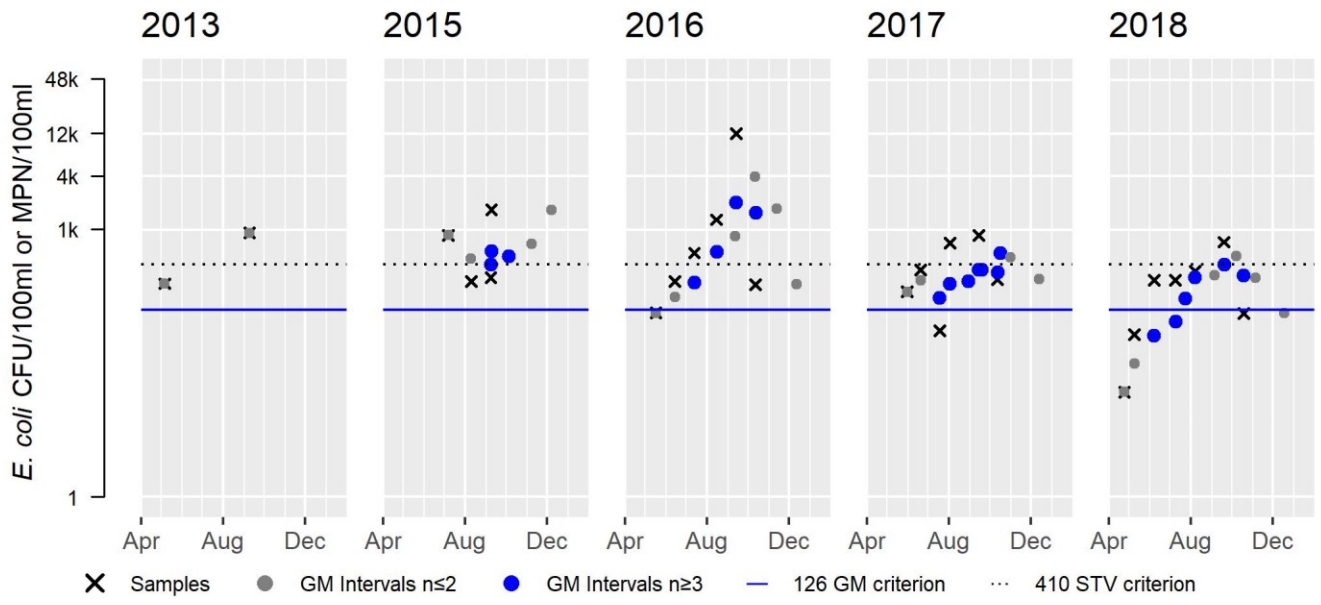
| Var | Res |
|---|---|
| Samples | 6 |
| SeasGM | 631 |
| #GMI | 4 |
| #GMI Ex | 4 |
| %GMI Ex | 100 |
| n>STV | 3 |
| %n>STV | 50 |

| Var | Res |
|---|---|
| Samples | 6 |
| SeasGM | 310 |
| #GMI | 7 |
| #GMI Ex | 7 |
| %GMI Ex | 100 |
| n>STV | 2 |
| %n>STV | 33 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 155 |
| #GMI | 6 |
| #GMI Ex | 4 |
| %GMI Ex | 67 |
| n>STV | 1 |
| %n>STV | 14 |

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

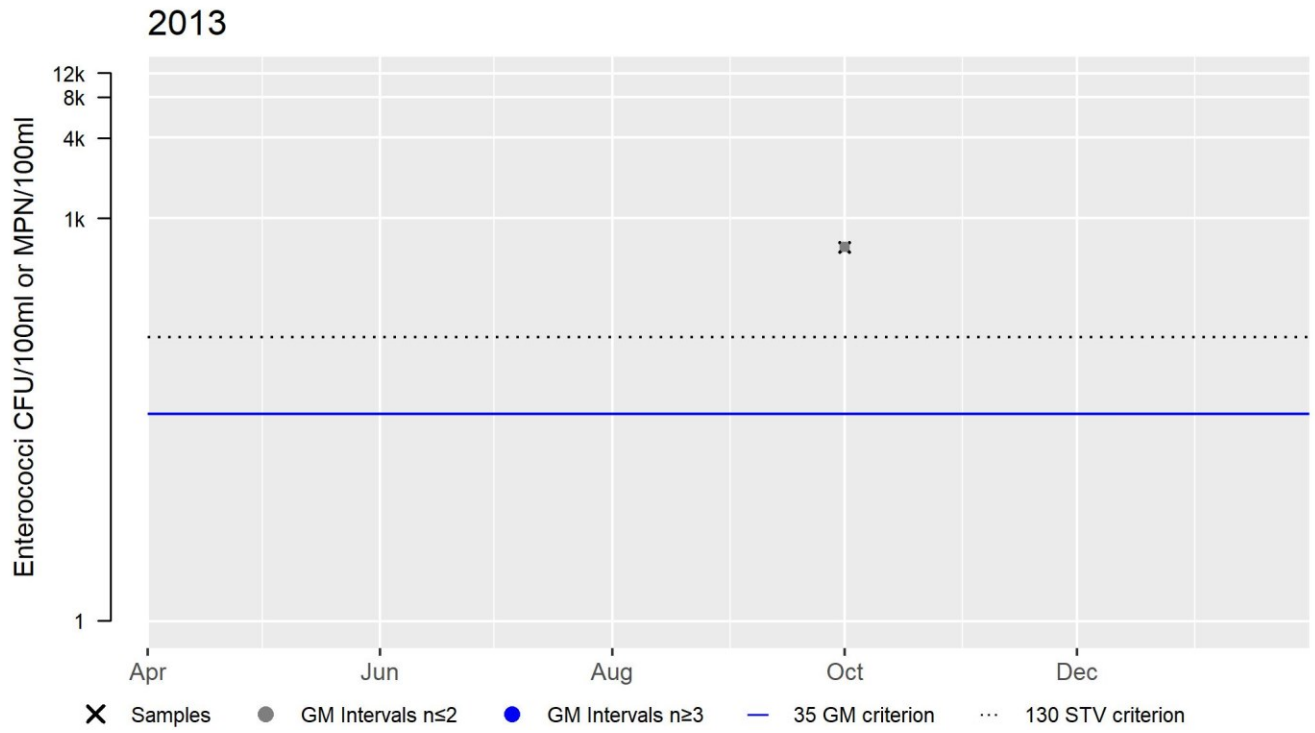
| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 90 |



W2447 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 610 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

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




**MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019** (MassDEP Undated 1)

| **Summary** |
|---|
| BST work was conducted in 2011 and 2013-2019 at one site along the Torrey Creek AU (MA53-14) at Barney Ave, with *E. coli* ranging 15 to 12,033MPN. It was noted that agriculture and geese were observed sources of bacteria in the watershed. |

## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|
| Fully Supporting | NO |
| **2022 Use Attainment Summary** | |

*E. coli* bacteria samples were collected by MassDEP and EPA staff in the middle and at the downstream end of this Torrey Creek AU (MA53-14), at the following sampling stations (data years): EPA 1-2 times per year – on Seekonk Speedway property, Seekonk (EPA_TC05) (2012 & 2013), MassDEP 4-8 times per year – just downstream of culvert southeast of Barney Avenue, Rehoboth (W2447) (2015-2018) and (just a few feet further downstream) EPA 1-2 times per year – @ the access Rd. off Barney Ave, ~350ft SSW from RT.195 (EPA_TC07) (2012-13 & 2015-19). EPA data were insufficient to make an assessment (as per the CALM "Use Attainment Impairment Decision Schema"). However, analysis of the DEP data (at the downstream end of the AU) indicated 50% of intervals had GMs >630 cfu/100ml in 2016, but 0% of intervals did in the other 3 sample years; 2 samples exceeded the 1260 cfu/100ml STV in 2016, but there were only 0-1 exceedances of the STV in the other 3 sample years; in addition, only 12% of the cumulative intervals had GMs >630 cfu/100ml. Since the *E. coli* concentrations were below the use attainment impairment thresholds for this multi-year moderate frequency dataset, the Secondary Contact Recreational Use for this Torrey Creek AU (MA53-14) will continue to be assessed as Fully Supporting.

## *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_TC05 | Environmental Protection Agency | Water Quality | Torrey Creek | On Seekonk Speedway property, Seekonk | 41.785509 | -71.298848 |
| EPA_TC07 | Environmental Protection Agency | Water Quality | Torrey Creek | Torrey Creek @ access rd off Barney Ave, approximately 350ft SSW from RT.195, Rehoboth | 41.780662 | -71.288315 |
| W2447 | MassDEP | Water Quality | Torrey Creek | [just downstream of culvert southeast of Barney Avenue, Rehoboth] | 41.780692 | -71.288306 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3) (MassDEP Undated 8) (MassDEP Undated 5)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_TC05 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 16 | 16 | 16 |
| EPA_TC05 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 4 | 147 | 24 |
| EPA_TC07 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 85 | 85 | 85 |
| EPA_TC07 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 318 | 953 | 551 |
| EPA_TC07 | Environmental Protection Agency | E. coli | 09/09/15 | 09/09/15 | 1 | 1670 | 1670 | 1670 |
| EPA_TC07 | Environmental Protection Agency | E. coli | 04/19/16 | 04/19/16 | 1 | 187 | 187 | 187 |
| EPA_TC07 | Environmental Protection Agency | E. coli | 04/20/17 | 05/31/17 | 2 | 21 | 179 | 61 |
| W2447 | MassDEP | E. coli | 05/06/13 | 09/09/13 | 2 | 248 | 921 | 478 |
| W2447 | MassDEP | E. coli | 07/07/15 | 09/09/15 | 4 | 261 | 1670 | 576 |
| W2447 | MassDEP | E. coli | 05/17/16 | 11/09/16 | 7 | 74 | 12000 | 464 |
| W2447 | MassDEP | E. coli | 05/31/17 | 11/14/17 | 7 | 73 | 866 | 257 |
| W2447 | MassDEP | E. coli | 04/24/18 | 11/05/18 | 8 | 15 | 727 | 135 |

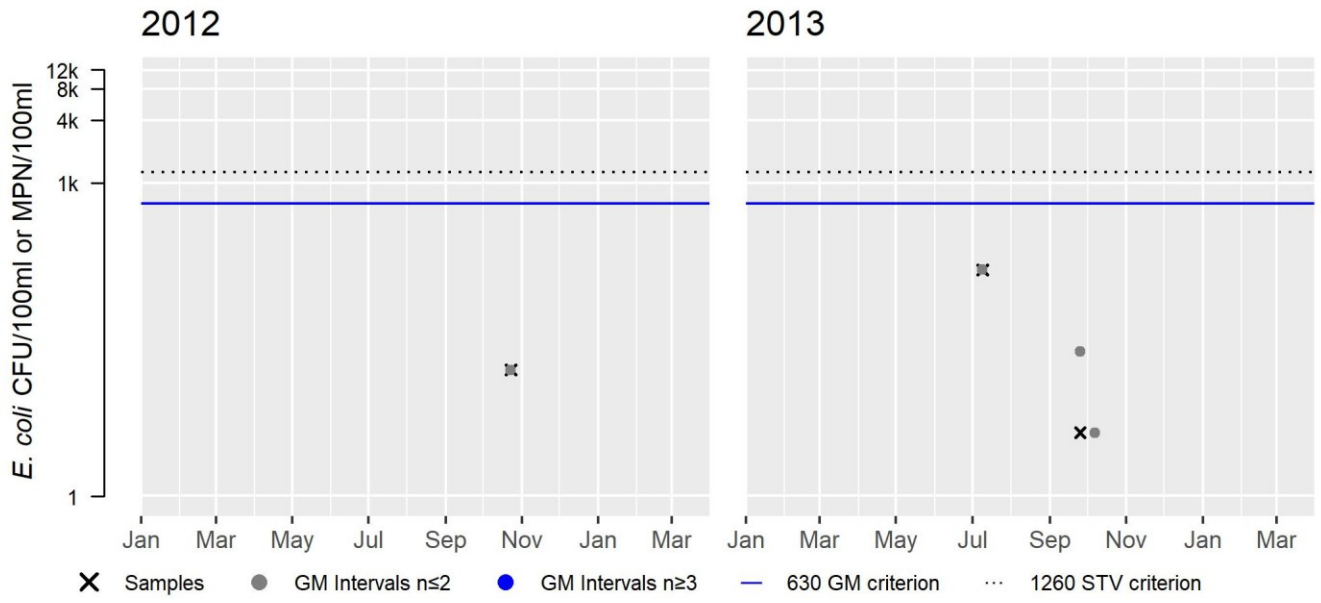
## EPA_TC05 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

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

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 24 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



## EPA_TC07 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 85 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 551 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

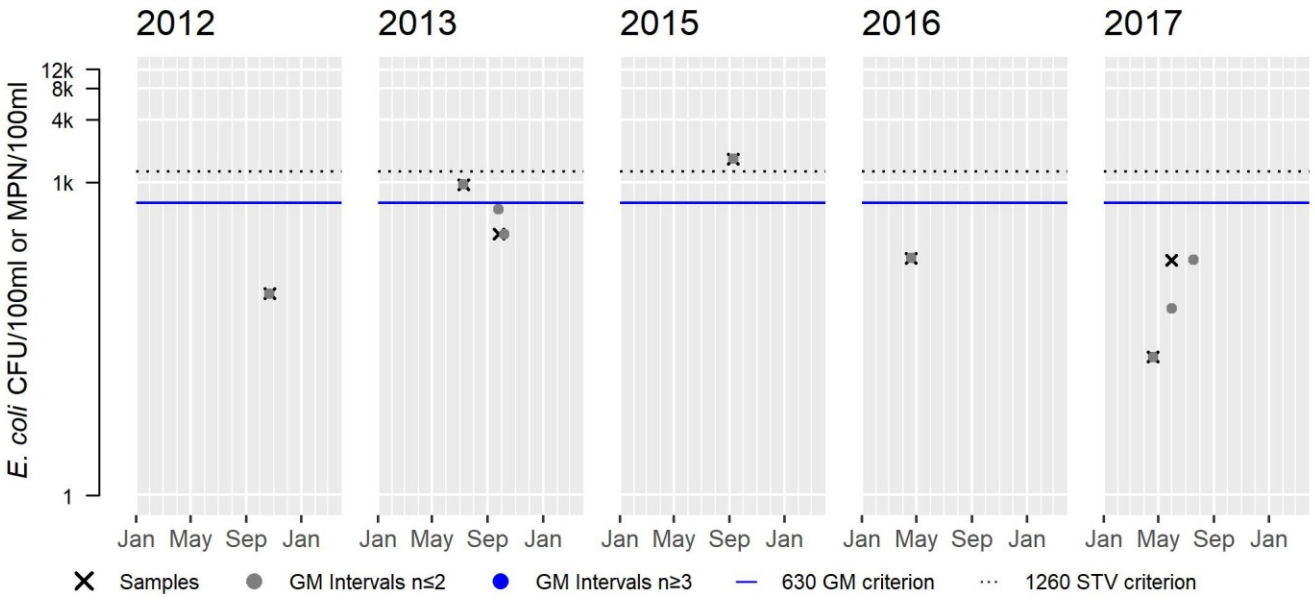
| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 1670 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 187 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 61 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



## W2447 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 478 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 4 |
| SeasGM | 576 |
| #GMI | 3 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 25 |

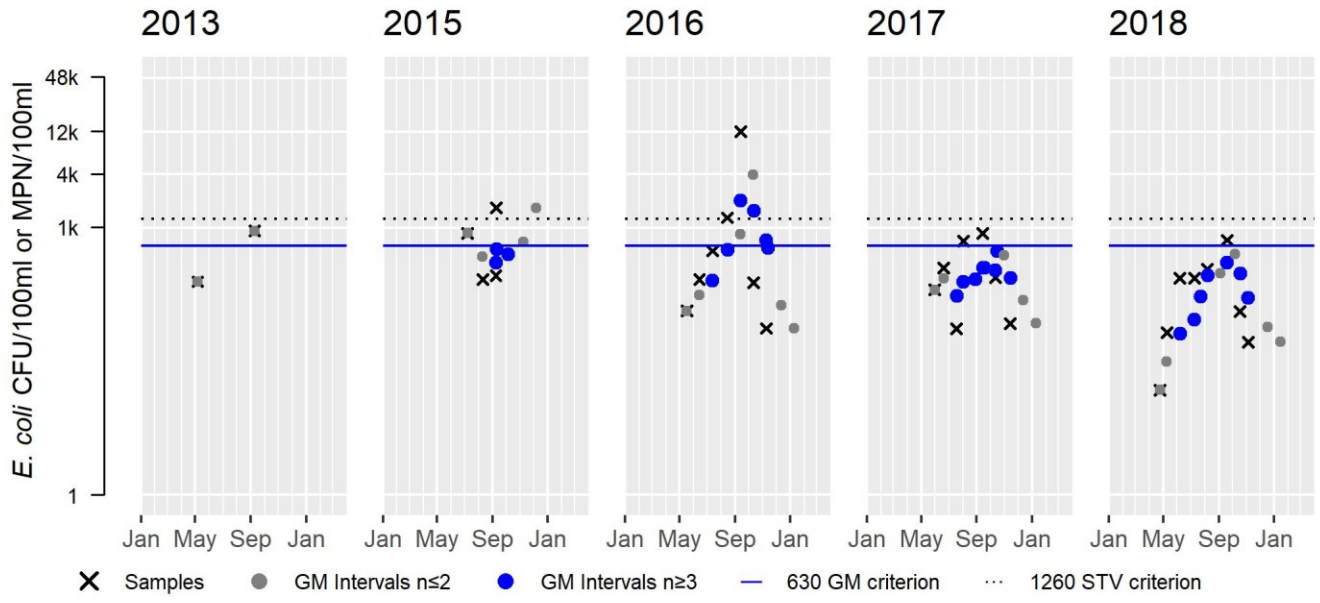
| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 464 |
| #GMI | 6 |
| #GMI Ex | 3 |
| %GMI Ex | 50 |
| n>STV | 2 |
| %n>STV | 29 |

| Var | Res |
|---|---|
| Samples | 7 |
| SeasGM | 257 |
| #GMI | 8 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 8 |
| SeasGM | 135 |
| #GMI | 7 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 12 |



# Torrey Creek (MA53-17)

| | |
|---|---|
| **Location:** | From just downstream of Barney Avenue, Rehoboth to confluence with Palmer River, Rehoboth (formerly part of 2008 segment: Torrey Creek MA53-14). |
| **AU Type:** | ESTUARY |
| **AU Size:** | 0.004 SQUARE MILES |
| **Classification/Qualifier:** | SA: SFO |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 4a | 4a | Fecal Coliform | 35088 | Unchanged |

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

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No data are available to assess the status of the Aquatic Life Use for this Torrey Creek AU (MA53-17), so it is Not Assessed. | |

### Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH; therefore, the Fish Consumption Use for this Torrey Creek AU (MA53-17) is Not Assessed. | |

### Shellfish Harvesting

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | YES |
| **2022 Use Attainment Summary** | |
| Torrey Creek (MA53-17): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0003 sq mi (6%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0003 sq mi (6%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area >= 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment, so the Shellfish Harvesting Use is evaluated as not supporting. | |

### *Shellfish Growing Area Classifications*

**MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

| Area Name | Waterbody/Area Description | Classification | Area (Sq. Mi.) | Area (% of AU) |
|---|---|---|---|---|
| MHB5.0 | Palmer River | Prohibited | 0.00026 | 6.2% |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No data are available to assess the status of the Aesthetic Use for this Torrey Creek AU (MA53-17), so it is Not Assessed. | |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Insufficient Information | NO |
| **2022 Use Attainment Summary** | |
| *Enterococcus* bacteria data were collected by EPA in this Torrey Creek AU (MA53-17) at the outlet of the creek (the downstream end of the AU) (EPA_PM62) once in 2013. Too limited bacteria data are available to assess the Primary Contact Recreational Use for this Torrey Creek AU (MA53-17) according to the CALM "Use Attainment Impairment Decision Schema" so it is assessed as Insufficient Information. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_PM62 | Environmental Protection Agency | Water Quality | Palmer River | Torrey Creek outlet to Palmer Mainstem, discharging at right bank of mainstem, ~ 0.2 mi downstrm I-195, Rehoboth | 41.776854 | -71.283571 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

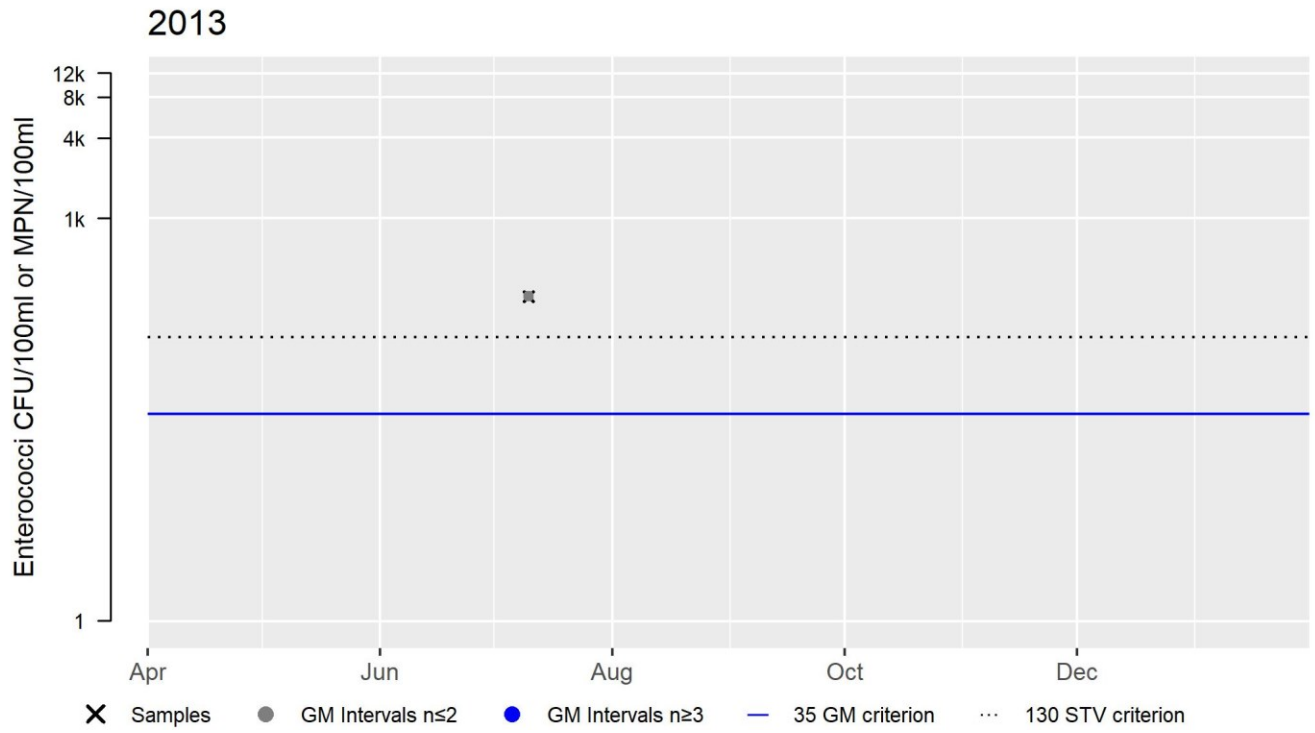
[Result units are CFU/100ml or MPN/100ml]

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_PM62 | Environmental Protection Agency | Enterococci | 07/10/13 | 07/10/13 | 1 | 262 | 262 | 262 |

EPA_PM62 Enterococci (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 262 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 100 |

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




### *Shellfish Growing Area Classifications*

**MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

| **Summary** |
|---|
| Torrey Creek (MA53-17): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0003 sq mi (6%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data. |

## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|
| Insufficient Information | NO |
| **2022 Use Attainment Summary** | |

*Enterococcus* bacteria data were collected by EPA in this Torrey Creek AU (MA53-17) at the outlet of the creek (the downstream end of the AU) (EPA_PM62) once in 2013. Too limited bacteria data are available to assess the Secondary Contact Recreational Use for this Torrey Creek AU (MA53-17) according to the CALM "Use Attainment Impairment Decision Schema" so it is assessed as Insufficient Information.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_PM62 | Environmental Protection Agency | Water Quality | Palmer River | Torrey Creek outlet to Palmer Mainstem, discharging at right bank of mainstem, ~ 0.2 mi downstrm I-195, Rehoboth | 41.776854 | -71.283571 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

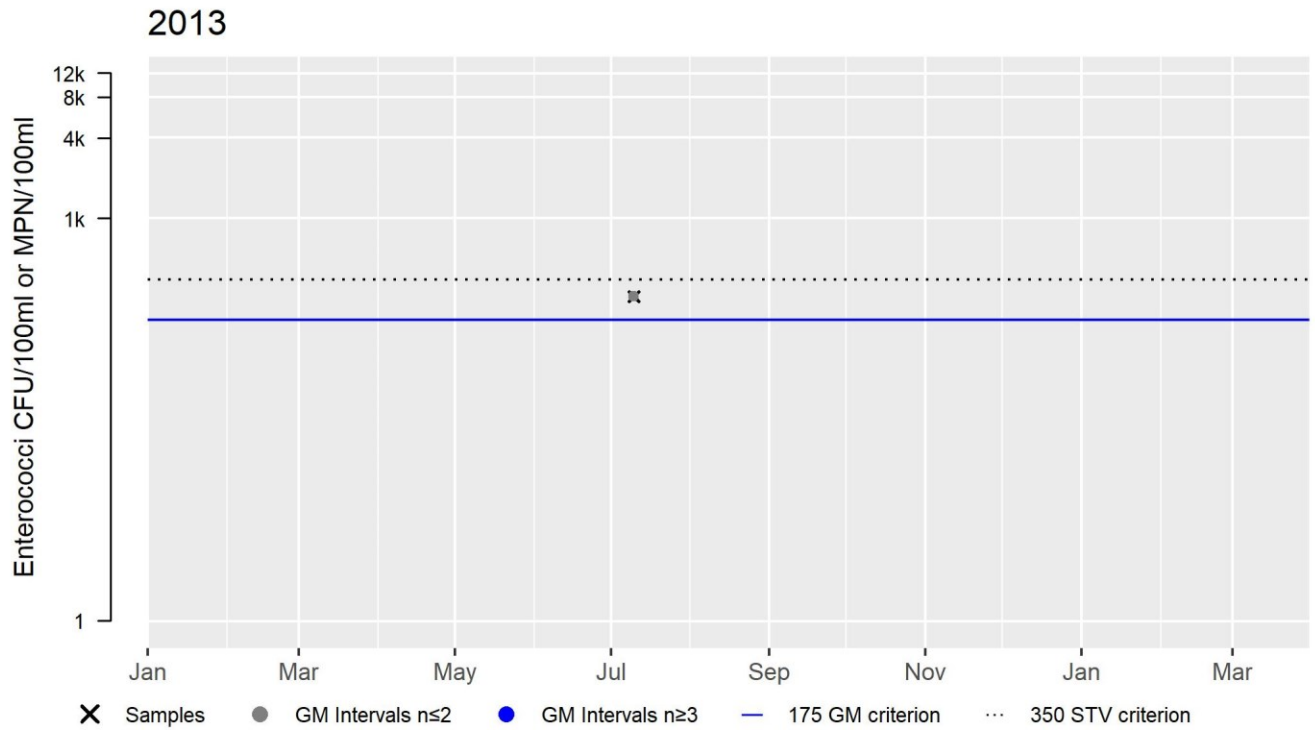
[Result units are CFU/100ml or MPN/100ml]

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_PM62 | Environmental Protection Agency | Enterococci | 07/10/13 | 07/10/13 | 1 | 262 | 262 | 262 |

EPA_PM62 Enterococci (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 262 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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




## *Shellfish Growing Area Classifications*

**MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

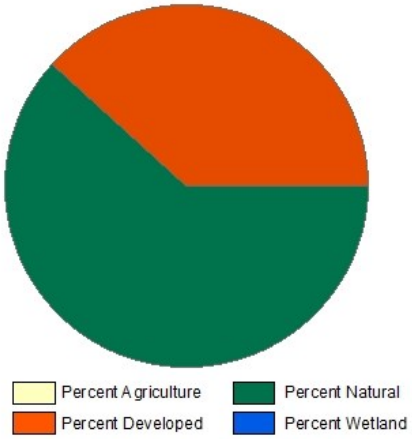
| **Summary** |
|---|
| Torrey Creek (MA53-17): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0003 sq mi (6%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data. |

# Unnamed Tributary (MA53-21)

| | |
|---|---|
| **Location:** | Headwaters east of Agawam Court, Seekonk to inlet of unnamed pond south of Sagamore Road, Seekonk. |
| **AU Type:** | RIVER |
| **AU Size:** | 0.6 MILES |
| **Classification/Qualifier:** | B |

**Unnamed Tributary - MA53-21**

Watershed Area: 0.33 square miles




| Landuse Type | Entire Basin | 5km Radius Proximal Subbasin | 100m Stream Buffer | Proximal Stream Buffer |
|---|---|---|---|---|
| Land Use Area (square miles) | 0.33 | 0.33 | 0.07 | 0.07 |
| Agriculture | 0% | 0% | 0% | 0% |
| Developed | 38.3% | 38.3% | 20.5% | 20.5% |
| Natural | 61.7% | 61.7% | 79.5% | 79.5% |
| Wetland | 0% | 0% | 0% | 0% |
| Impervious Cover | 16.9% | | | |

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

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

## Designated Use Attainment Decisions

## Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Insufficient Information | NO |

**2022 Use Attainment Summary**

EPA conducted limited discrete water quality monitoring at downstream end of this unnamed tributary AU (MA53-21) at Sagamore Rd, Seekonk (EPA_CR04), in the fall of 2012 and summer of 2013. The data were indicative of good water quality: pH ranged from 6.7-7.7SU (n=3); maximum temperature 14.7°C (n=1); minimum DO 9.3mg/L and maximum DO saturation 105.3% (n=3). Specific conductance was all low with a maximum of 293µS/cm (n=3), with none measuring above the estimated chloride criterion. There was no other monitoring data (biological or physico-chemical) collected for in this Unnamed Tributary. Too limited data are available to assess the Aquatic Life Use for this Unnamed Tributary (MA53-21) so it is assessed as Insufficient Information.

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_CR04 | Environmental Protection Agency | Water Quality | Unnamed Tributary | Unnamed tributary @ Sagamore Road, Seekonk | 41.805617 | -71.310738 |

### *Physico-chemical Water Quality Information*

## DO, pH, Temperature

**EPA Freshwater Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| EPA_CR04 | 10/23/12 | 10/23/12 | 1 | 10.9 | 10.9 | 0 | 0 | 0 |
| EPA_CR04 | 07/09/13 | 09/25/13 | 2 | 9.3 | 9.3 | 0 | 0 | 0 |

**EPA Freshwater Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA_CR04 | 10/23/12 | 10/23/12 | 1 | 0 | 13.6 | 13.6 | 0 | 0 | 0 | 0 |
| EPA_CR04 | 07/09/13 | 09/25/13 | 2 | 1 | 14.7 | 14.3 | 0 | 0 | 0 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_CR04 | 10/23/12 | 10/23/12 | 1 | 7.7 | 7.7 | 0 | 0 |
| EPA_CR04 | 07/09/13 | 09/25/13 | 2 | 6.7 | 7.1 | 0 | 0 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**EPA Freshwater Nutrient Enrichment Indicator Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | DO Sat Max (%) | pH Max (SU) |
|---|---|---|---|---|---|---|---|
| EPA_CR04 | 2012 | -- | -- | -- | -- | 105.3 | 7.7 |
| EPA_CR04 | 2013 | -- | -- | -- | -- | 92.4 | 7.1 |

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

**EPA Discrete Specific Conductance Data (2012-2013, 2016-2019) Compared to Estimated Chloride Criteria.** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_CR04 | 10/23/12 | 10/23/12 | 1 | 227 | 227 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_CR04 | 07/09/13 | 09/25/13 | 2 | 239 | 293 | 0 | 0 | 0 | 0 | 0 | 0 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH; therefore, the Fish Consumption Use for Unnamed Tributary (MA53-21) is Not Assessed. | |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No data are available to assess the status of the Aesthetic Use for this Unnamed Tributary (MA53-21), so it is Not Assessed. | |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria data were collected in the unnamed tributary (MA53-21) at the following sampling stations (data years): EPA sampled at the downstream end of the AU (at Sagamore Rd) (EPA_CR04) once in 2012 and twice in 2013. *E. coli* counts were usually less than 126 cfu/100ml and always less than the 410 STV criterion. Too limited data are available to assess the Primary Contact Recreational Use for this Unnamed Tributary (MA53-21) according to the CALM "Use Attainment Impairment Decision Schema" so this use will continue to be assessed as Not Supporting with the *E. coli* impairment being carried forward. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_CR04 | Environmental Protection Agency | Water Quality | Clear Run Brook | Clear Run Brook @ Sagamore Road, Seekonk | 41.805617 | -71.310738 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_CR04 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 8 | 8 | 8 |
| EPA_CR04 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 73 | 215 | 125 |

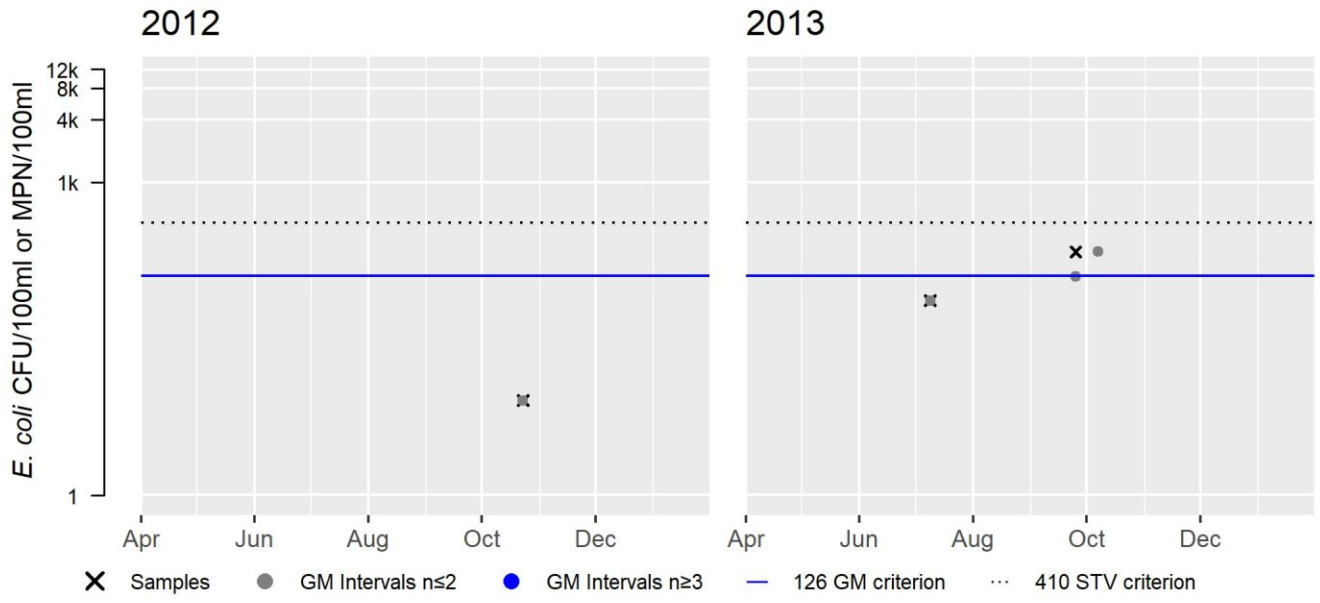
EPA_CR04 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 8 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 125 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |




## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|
| Insufficient Information | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria data were collected in the unnamed tributary (MA53-21) at the following sampling stations (data years): EPA sampled at the downstream end of the AU (at Sagamore Rd) (EPA_CR04) once in 2012 and twice in 2013 at EPA_CR04. *E. coli* counts were always less than 630 cfu/100ml. The available bacteria data are too limited to assess the Secondary Contact Recreational Use for this AU according to the CALM "Use Attainment Impairment Decision Schema"; consequently, this unnamed tributary is assessed as having Insufficient Information | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_CR04 | Environmental Protection Agency | Water Quality | Clear Run Brook | Clear Run Brook @ Sagamore Road, Seekonk | 41.805617 | -71.310738 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_CR04 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 8 | 8 | 8 |
| EPA_CR04 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 73 | 215 | 125 |

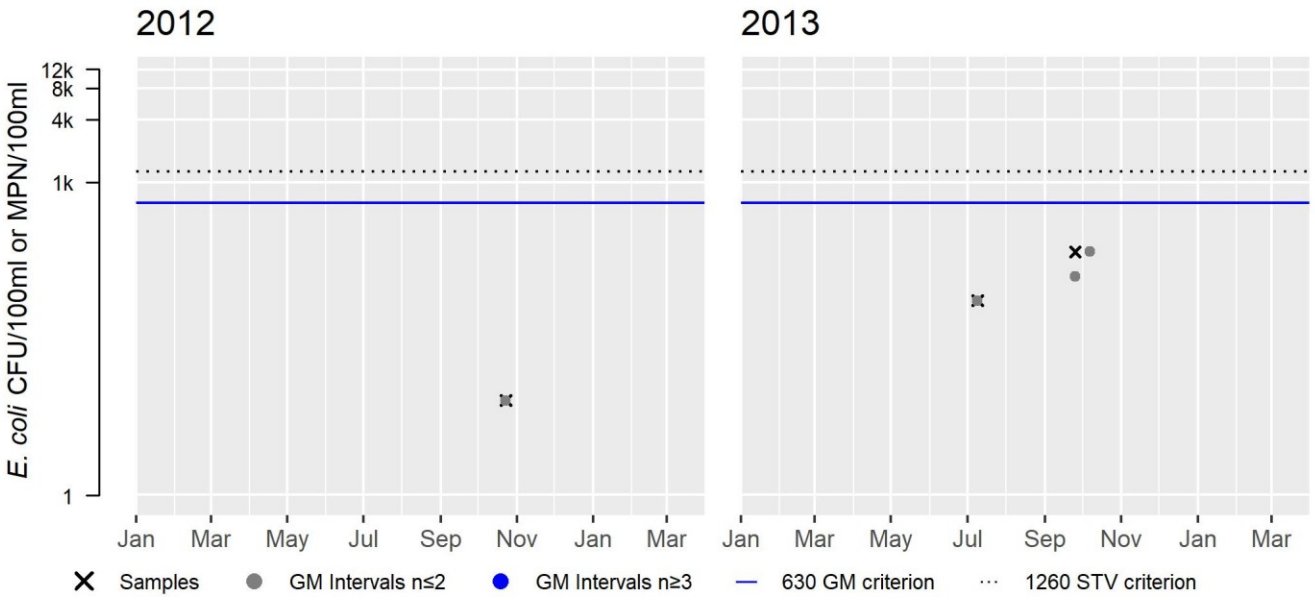
## EPA_CR04 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 8 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 125 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



# Warren River Pond (MA53-06)

| | |
|---|---|
| **Location:** | Salt pond in Swansea on MA/RI border (portion in MA only). |
| **AU Type:** | ESTUARY |
| **AU Size:** | 0.06 SQUARE MILES |
| **Classification/Qualifier:** | SA: SFO |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 4a | 4a | Fecal Coliform | 38904 | Unchanged |

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

## Recommendations

| 2022 Recommendations |
|---|
| ALU: Additional dissolved oxygen monitoring at Warren River Pond should be conducted to better evaluate to clarify if it is meeting criteria. |

## Designated Use Attainment Decisions

### Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Insufficient Information | NO |
| **2022 Use Attainment Summary** | |
| EPA conducted one discrete water quality monitoring survey at the Warren River Pond spillway where it discharges into the Palmer River, in Swansea (EPA_SC42), in July 2013. The data were usually indicative of good water quality for this estuarine AU: pH was 7.1SU; maximum temperature 27.4°C; minimum DO was a little low to be protective of anadromous fish early life stages (at 4.2mg/L), with a maximum DO saturation of 53%. No other monitoring data (biological or physico-chemical) were collected. Too limited data area available to assess the Aquatic Life Use for Warren River Pond so it is assessed as having Insufficient Information. | |

#### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_SC42 | Environmental Protection Agency | Water Quality | Palmer R Estuary | Pond spillway into Palmer River, Swansea | 41.762753 | -71.282398 |

*Physico-chemical Water Quality Information*

## DO, pH, Temperature

**EPA Estuarine Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | % Meas. <5.0 | % Meas. <4.0 |
|---|---|---|---|---|---|---|---|
| EPA_SC42 | 07/09/13 | 07/09/13 | 1 | 4.2 | 4.2 | 100 | 0 |

**EPA Estuarine Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer Index is June 1 – Sept 15]

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count >29.4 |
|---|---|---|---|---|---|---|---|
| EPA_SC42 | 07/09/13 | 07/09/13 | 1 | 1 | 27.4 | 27.4 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_SC42 | 07/09/13 | 07/09/13 | 1 | 7.1 | 7.1 | 0 | 0 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH; therefore, the Fish Consumption Use for Warren River Pond (MA53-06) is Not Assessed. | |

## Shellfish Harvesting

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | YES |
| **2022 Use Attainment Summary** | |
| Warren River Pond (MA53-06): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0538 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). The prohibited shellfish growing area represents 0.0538 sq mi (91%). There is insufficient information available to assess the Shellfish Harvesting Use because the growing areas within this AU are classified as either entirely prohibited or a combination of approved and prohibited. Alert due to prohibited area >= 0.0001 sq mi. There is insufficient information available to delist the existing Fecal Coliform impairment, so the Shellfish Harvesting Use is evaluated as not supporting. | |

*Shellfish Growing Area Classifications*

**MassDFG-Division of Marine Fisheries Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

| Area Name | Waterbody/Area Description | Classification | Area (Sq. Mi.) | Area (% of AU) |
|---|---|---|---|---|
| MHB5.0 | Palmer River | Prohibited | 0.05379 | 90.7% |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No data are available to assess the status of the Aesthetic Use for Warren River Pond (MA53-06), so it is Not Assessed. | |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No data are available to assess the Primary Contact Recreational Use for Warren River Pond, so it is Not Assessed. | |

### *Bacteria Data*

**MassDEP Bacteria Source Tracking (BST) Summary Statement for 2011-2019** (MassDEP Undated 1)

| Summary |
|---|
| BST work was conducted at 1 site in the Warren Pond AU (MA53-06) in 2013, at the point where the pond discharges to the Palmer River (MA53-03), with *E. coli* counts of <10MPN (n=2). BST work was also conducted on an unnamed tributary (in effect a series of small ponds) to the Warren Pond AU in 2013, with *E. coli* counts ranging <1 to 3,654MPN. No correctable source was ever found. |

### *Shellfish Growing Area Classifications*

**MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

| Summary |
|---|
| Warren River Pond (MA53-06): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0538 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Primary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data. |

## Secondary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No data are available to assess the Secondary Contact Recreational Use for Warren River Pond, so it is Not Assessed | |

### *Shellfish Growing Area Classifications*

**MassDEP Summary Statement for MassDFG Shellfish Growing Area Classification Data** (Bettencourt August 25, 2021) (MassDEP Undated 6)

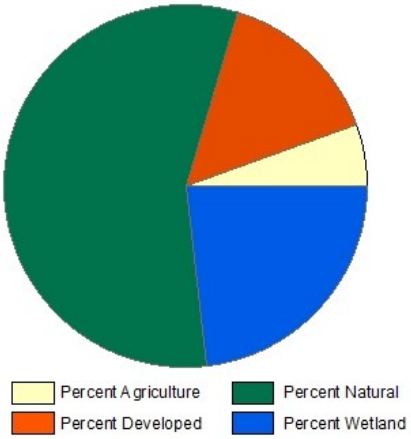
| Summary |
|---|
| Warren River Pond (MA53-06): The total of all shellfish growing area classifications (Bettencourt August 25, 2021) within this AU is 0.0538 sq mi (91%). The approved shellfish growing area represents 0 sq mi (0%). Because the total of all shellfish growing area classifications is anything less than “approved”, the Secondary Contact Recreational Use cannot be assessed for 2022 using the shellfish classification data. |

# West Branch Palmer River (MA53-07)

| | |
|---|---|
| **Location:** | Headwaters just north of Fairfield Street, Rehoboth to confluence with East Branch Palmer River (forming Palmer River), Rehoboth. |
| **AU Type:** | RIVER |
| **AU Size:** | 4.4 MILES |
| **Classification/Qualifier:** | B |

**West Branch Palmer River - MA53-07**

Watershed Area: 7.78 square miles




| Landuse Type | Entire Basin | 5km Radius Proximal Subbasin | 100m Stream Buffer | Proximal Stream Buffer |
|---|---|---|---|---|
| Land Use Area (square miles) | 7.78 | 5.02 | 2.25 | 1.57 |
| Agriculture | 5.5% | 4% | 7.7% | 6% |
| Developed | 14.9% | 13% | 13.4% | 13.7% |
| Natural | 56.5% | 60.8% | 45.2% | 49.3% |
| Wetland | 23.1% | 22.1% | 33.8% | 31% |
| Impervious Cover | 4.8% | | | |

| 2018/20 AU Category | 2022 AU Category | Impairment | ATTAINS Action ID | Impairment Change Summary |
|---|---|---|---|---|
| 2 | 5 | (Fish Passage Barrier*) | | Added |
| 2 | 5 | Dissolved Oxygen | | Added |

| Impairment | Source (Confirmed Y/N) | Fish, other Aquatic Life and Wildlife | Fish Consumption | Aesthetic | Primary Contact Recreation | Secondary Contact Recreation |
|---|---|---|---|---|---|---|
| (Fish Passage Barrier*) | Dam or Impoundment (Y) | X | | | | |
| Dissolved Oxygen | Source Unknown (N) | X | | | | |

## Recommendations

| 2022 Recommendations |
|---|
| ALU: Conduct water quality monitoring in the West Branch Palmer River (specifically long term DO and temperature probe deployments) to better evaluate the Aquatic Life Use and CFR habitat. |

# Designated Use Attainment Decisions

## Fish, other Aquatic Life and Wildlife

| 2022 Use Attainment | Alert |
|---|---|
| Not Supporting | YES |

**2022 Use Attainment Summary**

DMF biologists note a structure causing passage limitation to diadromous fish in the middle of the West Branch Palmer River AU. The Perryville Dam (NATID# MA02466) (with no associated fishway) located just upstream of Danforth Street in Rehoboth, was given a passage score of "10" on a 0-10 scale, indicating that the dam allows no possible passage of the targeted fish species, river herring and American shad. The population score in the area was noted to be "2". It was suggested by DMF biologists that this dam could possibly be a candidate for removal, though it was noted that a fishway at this site would have little benefit. MassDFG biologists sampled the fish population (using a backpack shocker), close to the downstream end of the river above Carpenter St, Rehoboth (SampleID 5298) in October 2014. This Cold-Water Fishery Resource was found to support 17% cold-water individuals (four Eastern brook trout measuring <140mm). EPA conducted limited discrete water quality monitoring throughout the river from up to downstream at Ash Street (EPA_WB33), Perryville Rd (EPA_WB36) & Carpenter Rd (EPA_WB37), Rehoboth, in the fall of 2012 and summer of 2013. The data can be summarized as follows: pH ranged from 6.7-7.7SU (n=9); maximum temperature 22.1°C (3 of 9 measurements above 20°C at all three sites in July 2013 and above 22°C in the river at EPA_WB36. The minimum DO was 3.0mg/L (n=9), failing to meet the cold-water criterion of 5.0mg/L at all three sample stations in July 2013. The maximum DO saturation was 87.6% (n=9). Specific conductance was low (maximum 166µS/cm, n=9), with none measuring above the estimated chloride criterion. The Aquatic Life Use for the West Branch Palmer River is assessed as Not Supporting because of the barrier to diadromous fish passage at the Perryville Dam and the low DO conditions documented in the river by EPA at all three of their sampling stations in July 2013. The prior Alert for elevated temperature is being carried forward (July 9th, 2013 survey also elevated).

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| 5298 | MassDFG | Fish Community | West Branch Palmer River | Above Carpenter Street, Rehoboth | 41.85509 | -71.25581 |

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_WB33 | Environmental Protection Agency | Water Quality | West Branch Palmer R | West Branch Palmer R @ Ash Street, Rehoboth | 41.887273 | -71.257581 |
| EPA_WB36 | Environmental Protection Agency | Water Quality | West Branch Palmer R | West Branch Palmer River mainstem @ Perryville Rd, Rehoboth | 41.870341 | -71.260755 |
| EPA_WB37 | Environmental Protection Agency | Water Quality | West Branch Palmer R | West Branch Palmer River mainstem @ Carpenter Rd, Rehoboth | 41.855134 | -71.255732 |

### *Biological Monitoring Information*

## Fish Community Data and DELTS

**Fish Community Data (2014-2019) Provided by MassDFG.** (MassDFG 2020) (MassDEP Undated 2)

[Sample Type: TP= Total Pickup, SP= Selective Pickup, Method: BT=Boat Shocking, BP= Backpack Shocking, BG= Barge Shocking, SE= Seine, SL= Snorkel, NS= Not Stated, MT= Minnow Trap, GN= Gillnet, FY= Fyke Net]
[Species List: AE = American Eel, CP = Chain Pickerel, EBT = Brook Trout, LMB = Largemouth Bass, RP = Redfin Pickerel, TD = Tesselated Darter]

| Sample ID | Sample Date | Method | Sample Type | Total Taxa | Total Ind | EBT Ind | EBT Min Length (mm) | EBT Max Length (mm) | EBT ≤140mm Ind | SC Ind | Cold Ind % | Fluvial Ind % | Notables | CFR | Species List |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5298 | 10/02/14 | BP | TP | 6 | 24 | 4 | 80 | 102 | 4 | 0 | 17% | 25% | Yes | Yes | AE, CP, EBT, LMB, RP, TD, |

## Habitat and Flow Data (anthropogenic alterations)

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

| Assessment Summary |
|---|
| DMF biologists note a structure causing passage limitation to diadromous fish in the middle of this Palmer River AU. The Perryville Dam (NATID# MA02466) (with no associated fishway) located just upstream of Danforth Street in Rehoboth, was given a passage score of "10" on a 0-10 scale, indicating that the dam allows no possible passage of the targeted fish species, river herring and American shad. The population score in the area was noted to be "2". It was suggested by DMF biologists that this dam could possibly be a candidate for removal, though it was noted that a fishway at this site would have little benefit. The Aquatic Life Use for Palmer River (Assessment Unit MA53-07) is assessed as Not Supporting, based on the barrier to diadromous fish passage at the Perryville Dam. |

## *Physico-chemical Water Quality Information*

## DO, pH, Temperature

**EPA Freshwater Discrete Dissolved Oxygen Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)
[CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | DO Count | DO Min (mg/L) | DO Avg (mg/L) | Count CW <5.0 | Count WW Early Life Stages <5.0 | Count WW Other Life Stages <4.0 |
|---|---|---|---|---|---|---|---|---|
| EPA_WB33 | 10/23/12 | 10/23/12 | 1 | 8.3 | 8.3 | 0 | 0 | 0 |
| EPA_WB33 | 07/09/13 | 09/25/13 | 2 | 3.0 | 5.9 | 1 | 1 | 1 |
| EPA_WB36 | 10/23/12 | 10/23/12 | 1 | 9.0 | 9.0 | 0 | 0 | 0 |
| EPA_WB36 | 07/09/13 | 09/25/13 | 2 | 3.5 | 6.3 | 1 | 1 | 1 |
| EPA_WB37 | 10/23/12 | 10/23/12 | 1 | 9.7 | 9.7 | 0 | 0 | 0 |
| EPA_WB37 | 07/09/13 | 09/25/13 | 2 | 4.2 | 6.7 | 1 | 1 | 0 |

**EPA Freshwater Discrete Temperature Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer Index is June 1 – Sept 15; CW= Coldwater, WW= Warmwater]

| Station Code | Start Date | End Date | Temp Count | Index Count | Temp Max (°C) | Temp Avg (°C) | Count CW >20 | Count CW >22 | Count WW >28.3 | Count WW >30.3 |
|---|---|---|---|---|---|---|---|---|---|---|
| EPA_WB33 | 10/23/12 | 10/23/12 | 1 | 0 | 10.4 | 10.4 | 0 | 0 | 0 | 0 |
| EPA_WB33 | 07/09/13 | 09/25/13 | 2 | 1 | 21.1 | 16.2 | 1 | 0 | 0 | 0 |
| EPA_WB36 | 10/23/12 | 10/23/12 | 1 | 0 | 10.7 | 10.7 | 0 | 0 | 0 | 0 |
| EPA_WB36 | 07/09/13 | 09/25/13 | 2 | 1 | 22.1 | 16.7 | 1 | 1 | 0 | 0 |
| EPA_WB37 | 10/23/12 | 10/23/12 | 1 | 0 | 10.8 | 10.8 | 0 | 0 | 0 | 0 |
| EPA_WB37 | 07/09/13 | 09/25/13 | 2 | 1 | 21.8 | 17.0 | 1 | 0 | 0 | 0 |

**EPA Discrete pH Data (2012-2013).** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | pH Count | pH Min (SU) | pH Max (SU) | pH Count <6.5 or >8.3 | pH Count <6.0 or >8.8 |
|---|---|---|---|---|---|---|---|
| EPA_WB33 | 10/23/12 | 10/23/12 | 1 | 7.4 | 7.4 | 0 | 0 |
| EPA_WB33 | 07/09/13 | 09/25/13 | 2 | 6.7 | 7.7 | 0 | 0 |
| EPA_WB36 | 10/23/12 | 10/23/12 | 1 | 7.4 | 7.4 | 0 | 0 |
| EPA_WB36 | 07/09/13 | 09/25/13 | 2 | 7.0 | 7.0 | 0 | 0 |
| EPA_WB37 | 10/23/12 | 10/23/12 | 1 | 7.3 | 7.3 | 0 | 0 |
| EPA_WB37 | 07/09/13 | 09/25/13 | 2 | 6.9 | 6.9 | 0 | 0 |

## Nutrients (Primary Producer Screening, Physico-chemical Screening)

**EPA Freshwater Nutrient Enrichment Indicator Data (2012, 2013 & 2016-2019).** (EPA 2020) (MassDEP Undated 3)
[Summer seasonal total phosphorus data collected May-Sept]

| Station Code | Data Year | Seasonal TP Count | Seasonal TP Min (mg/L) | Seasonal TP Max (mg/L) | Seasonal TP Avg (mg/L) | DO Sat Max (%) | pH Max (SU) |
|---|---|---|---|---|---|---|---|
| EPA_WB33 | 2012 | -- | -- | -- | -- | 74.8 | 7.4 |
| EPA_WB33 | 2013 | -- | -- | -- | -- | 80.0 | 7.7 |
| EPA_WB36 | 2012 | -- | -- | -- | -- | 81.3 | 7.4 |
| EPA_WB36 | 2013 | -- | -- | -- | -- | 81.7 | 7.0 |
| EPA_WB37 | 2012 | -- | -- | -- | -- | 87.6 | 7.3 |
| EPA_WB37 | 2013 | -- | -- | -- | -- | 85.8 | 6.9 |

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

**EPA Discrete Specific Conductance Data (2012-2013, 2016-2019) Compared to Estimated Chloride Criteria.** (EPA 2020) (MassDEP Undated 3)

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_WB33 | 10/23/12 | 10/23/12 | 1 | 150 | 150 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_WB33 | 07/09/13 | 09/25/13 | 2 | 165 | 166 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_WB36 | 10/23/12 | 10/23/12 | 1 | 131 | 131 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_WB36 | 07/09/13 | 09/25/13 | 2 | 139 | 150 | 0 | 0 | 0 | 0 | 0 | 0 |
| EPA_WB37 | 10/23/12 | 10/23/12 | 1 | 123 | 123 | 0 | 0 | 0 | 0 | 0 | 0 |

| Station Code | Start Date | End Date | SpCond Count | SpCond Min (µs/cm) | SpCond Max (µs/cm) | Count SpCond >904 | Count SpCond >994 | Count SpCond >3193 | Count SpCond >3512 | Consecutive sets >904 | Consecutive sets >994 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA_WB37 | 07/09/13 | 09/25/13 | 2 | 127 | 133 | 0 | 0 | 0 | 0 | 0 | 0 |

## Fish Consumption

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No site-specific fish consumption advisory has been issued by DPH; therefore, the Fish Consumption Use for West Branch Palmer River (MA53-07) is Not Assessed. | |

## Aesthetic

| 2022 Use Attainment | Alert |
|---|---|
| Not Assessed | NO |
| **2022 Use Attainment Summary** | |
| No data are available to assess the status of the Aesthetic Use for West Branch Palmer River (MA53-07), so it is Not Assessed. | |

## Primary Contact Recreation

| 2022 Use Attainment | Alert |
|---|---|
| Insufficient Information | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria data were collected in West Branch Palmer River (MA53-07) in Rehoboth at the following sampling stations (data years): EPA 1-2 times per year – Ash Street (EPA_WB33), Perryville Rd (EPA_WB36), and Carpenter Rd (EPA_WB37) (fall of 2012 & summer of 2013). Too limited data are available to assess the Primary Contact Recreational Use for this AU according to the CALM "Use Attainment Impairment Decision Schema"; consequently, the Primary Contact Recreational Use for the West Branch Palmer River is assessed as having Insufficient Information. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_WB33 | Environmental Protection Agency | Water Quality | West Branch Palmer R | West Branch Palmer R @ Ash Street, Rehoboth | 41.887273 | -71.257581 |
| EPA_WB36 | Environmental Protection Agency | Water Quality | West Branch Palmer R | West Branch Palmer River mainstem @ Perryville Rd, Rehoboth | 41.870341 | -71.260755 |
| EPA_WB37 | Environmental Protection Agency | Water Quality | West Branch Palmer R | West Branch Palmer River mainstem @ Carpenter Rd, Rehoboth | 41.855134 | -71.255732 |

## *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020)
(MassDEP Undated 3)
[Result units are CFU/100ml or MPN/100ml]

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result | Maximum Sample Result | Seasonal Geometric Mean |
|---|---|---|---|---|---|---|---|---|
| EPA_WB33 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 4 | 4 | 4 |
| EPA_WB33 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 81 | 542 | 210 |
| EPA_WB36 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 133 | 133 | 133 |
| EPA_WB36 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 326 | 442 | 380 |
| EPA_WB37 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 12 | 12 | 12 |
| EPA_WB37 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 76 | 93 | 84 |

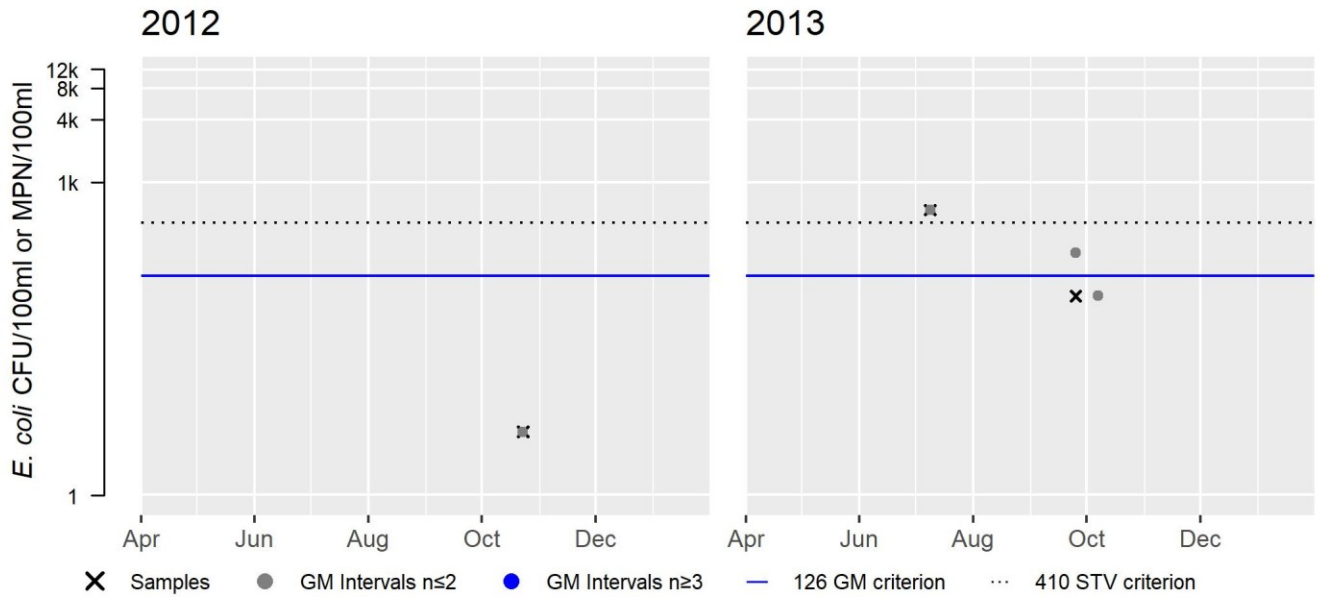
## EPA_WB33 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 4 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 210 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



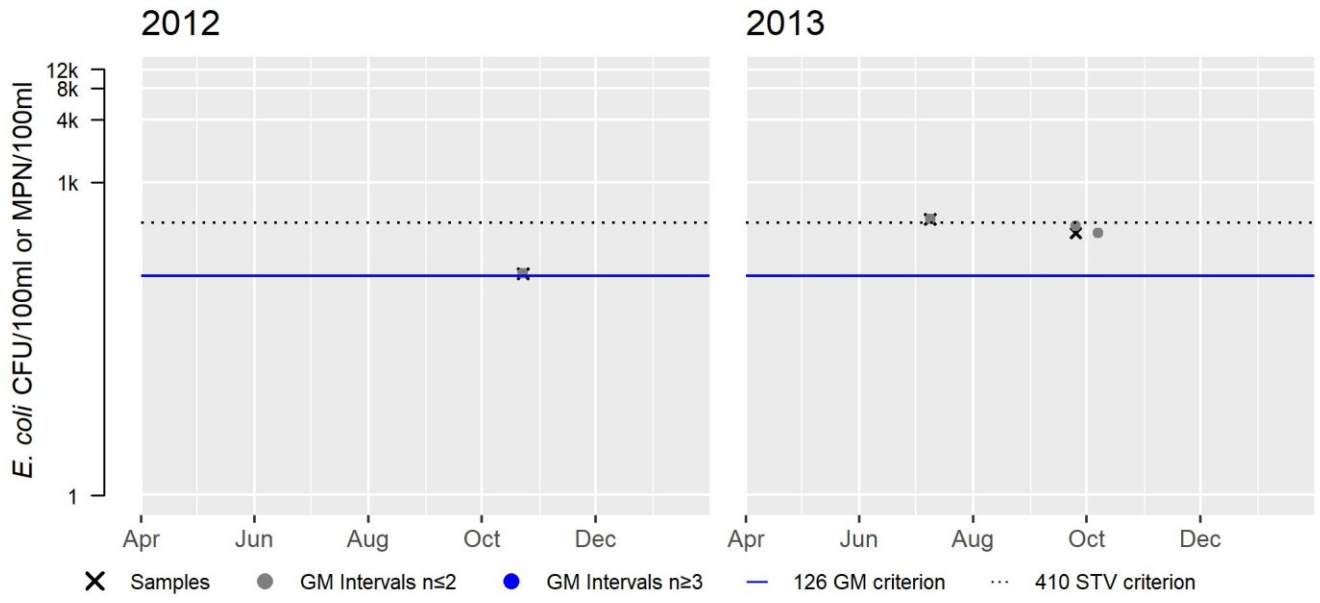
## EPA_WB36 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 133 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 380 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 1 |
| %n>STV | 50 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



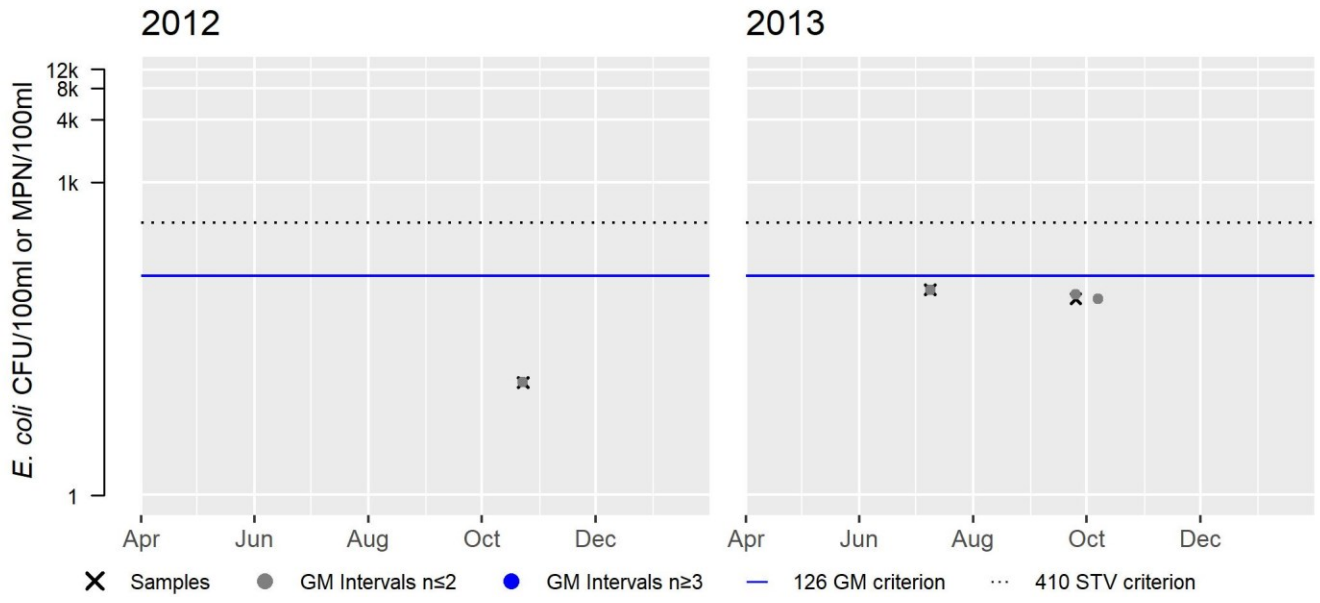
EPA_WB37 *E. coli* (90-day Interval), Primary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 12 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 84 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |




## Secondary Contact Recreation

| **2022 Use Attainment** | **Alert** |
|---|---|
| Insufficient Information | NO |
| **2022 Use Attainment Summary** | |
| *E. coli* bacteria data were collected in West Branch Palmer River (MA53-07) in Rehoboth at the following sampling stations (data years): EPA 1-2 times per year – Ash Street (EPA_WB33), Perryville Rd (EPA_WB36), and Carpenter Rd (EPA_WB37) (fall of 2012 & summer of 2013). Too limited data are available to assess the Secondary Contact Recreational Use for this AU according to the CALM "Use Attainment Impairment Decision Schema"; consequently, the Secondary Contact Recreational Use for the West Branch Palmer River is assessed as having Insufficient Information. | |

### *Monitoring Stations*

| Station Code | Organization | Type | Water Body | Station Description | Latitude | Longitude |
|---|---|---|---|---|---|---|
| EPA_WB33 | Environmental Protection Agency | Water Quality | West Branch Palmer R | West Branch Palmer R @ Ash Street, Rehoboth | 41.887273 | -71.257581 |
| EPA_WB36 | Environmental Protection Agency | Water Quality | West Branch Palmer R | West Branch Palmer River mainstem @ Perryville Rd, Rehoboth | 41.870341 | -71.260755 |
| EPA_WB37 | Environmental Protection Agency | Water Quality | West Branch Palmer R | West Branch Palmer River mainstem @ Carpenter Rd, Rehoboth | 41.855134 | -71.255732 |

### *Bacteria Data*

**Bacteria Data Collected by MassDEP and External Data Providers 2011-2020 (90-day Interval Analysis)** (EPA 2020) (MassDEP Undated 3)

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

| Station Code | Organization | Indicator | Start Date | End Date | Sample Count | Minimum Sample Result (CFU/100ml or MPN/100ml) | Maximum Sample Result (CFU/100ml or MPN/100ml) | Seasonal Geometric Mean (CFU/100ml or MPN/100ml) |
|---|---|---|---|---|---|---|---|---|
| EPA_WB33 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 4 | 4 | 4 |
| EPA_WB33 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 81 | 542 | 210 |
| EPA_WB36 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 133 | 133 | 133 |
| EPA_WB36 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 326 | 442 | 380 |
| EPA_WB37 | Environmental Protection Agency | E. coli | 10/23/12 | 10/23/12 | 1 | 12 | 12 | 12 |
| EPA_WB37 | Environmental Protection Agency | E. coli | 07/09/13 | 09/25/13 | 2 | 76 | 93 | 84 |

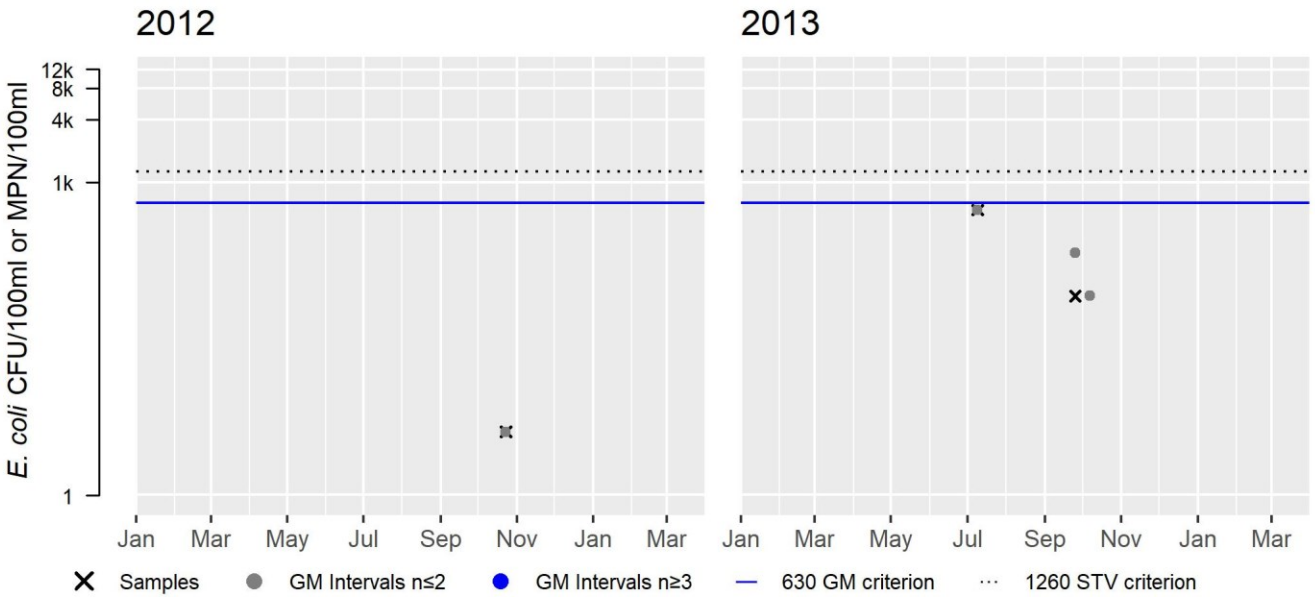
## EPA_WB33 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 4 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 210 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



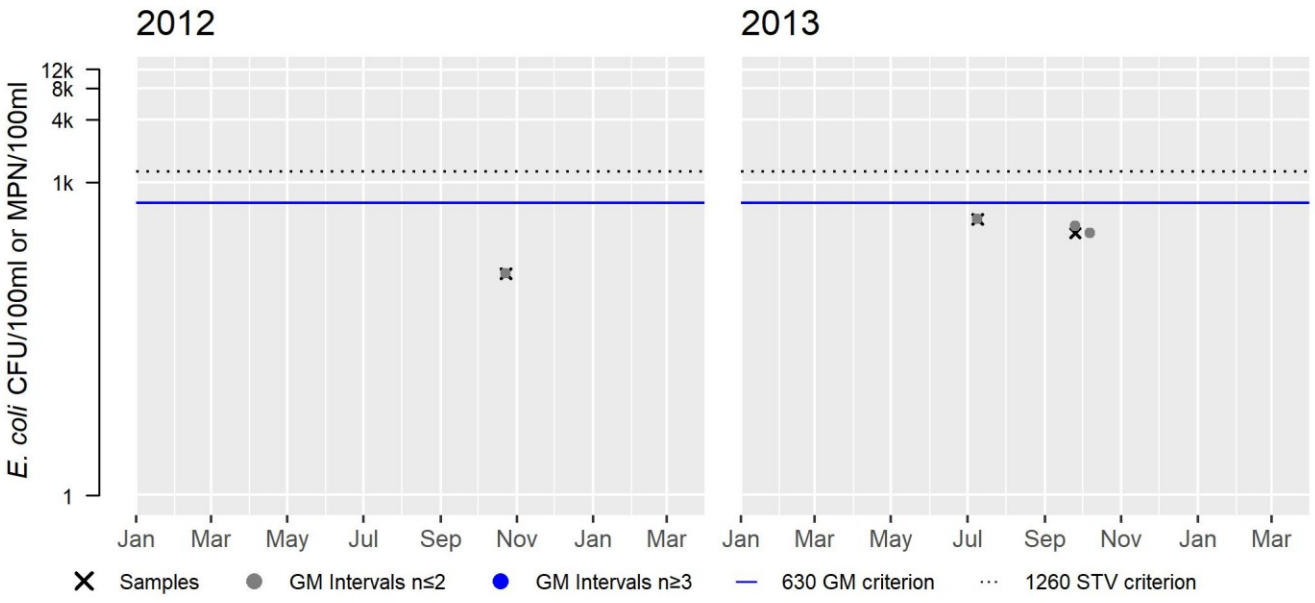
## EPA_WB36 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 133 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 380 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



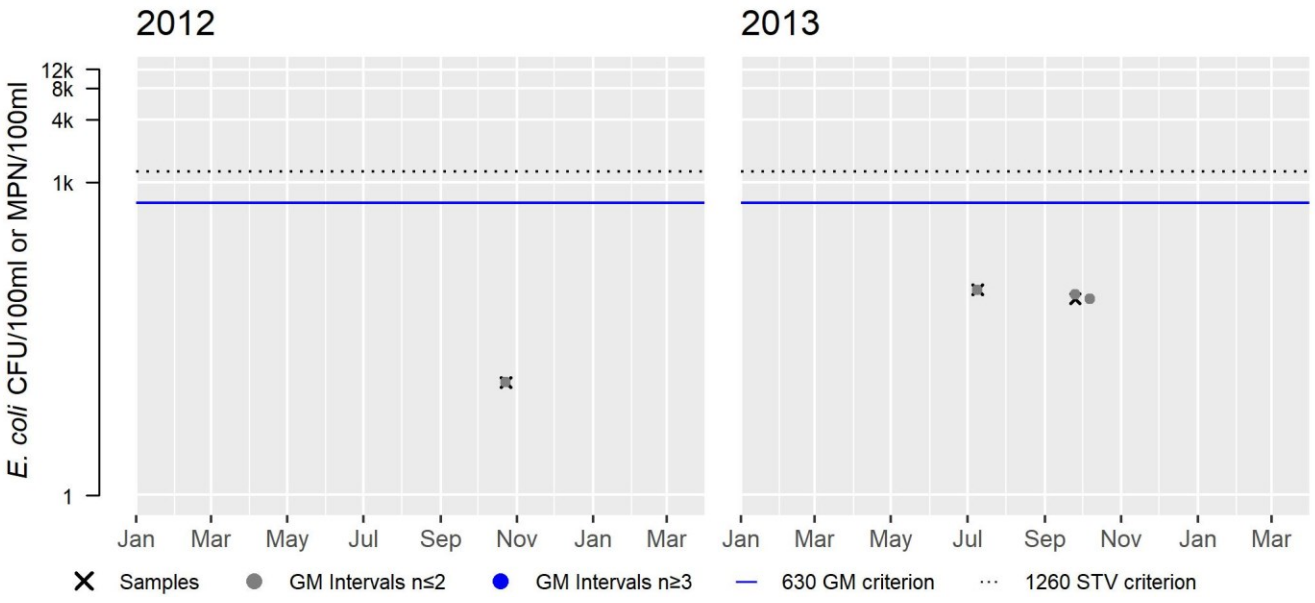
## EPA_WB37 *E. coli* (90-day Interval), Secondary Contact Recreational Use Season

| Var | Res |
|---|---|
| Samples | 1 |
| SeasGM | 12 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

| Var | Res |
|---|---|
| Samples | 2 |
| SeasGM | 84 |
| #GMI | 0 |
| #GMI Ex | 0 |
| %GMI Ex | 0 |
| n>STV | 0 |
| %n>STV | 0 |

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

| *Variable* | Cumulative %GMI Ex (all years) |
|---|---|
| *Result* | 0 |



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