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Department of Environmental Protection



Kinney Shores, Saco

2018 / 2020 / 2022 Integrated Water Quality Monitoring and Assessment Report

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MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
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CHAPTER 1 PREFACE

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This document, which may be referenced as the 'Integrated Report', 'Report', or 'IR', is being submitted to fulfill biennial reporting requirements on both federal and state levels. The federal requirement arises from the Clean Water Act (CWA), particularly § 305(b) (state reports on water quality), § 303(d) (list of impaired waters), and § 314 (Clean Lakes Program). The state requirement arises from 38 Maine Revised Statutes (M.R.S.) § 464(3)(A) (report on the quality of the State's waters to the Maine Legislature). The Maine Department of Environmental Protection (The Department or DEP) assembles these reports with input from many sources, and recognizes that the § 305(b) Report and § 303(d) List are important ways of regularly communicating information on the health, current status and trends of the State's waters.

Over the past several reporting cycles, Maine DEP has fallen behind on timely submittals for the IR. In an attempt to catch up, the Department compiled an abbreviated 2016 Report, in which only assessments for lakes/ponds and wetlands were updated based on two years' worth of data (calendar years 2013 and 2014); for rivers/streams and estuarine/marine waters, assessments were updated for only a few select waterbodies[1], also based on 2013 and 2014 data. Most of the remaining portions of the 2016 IR showed the content of the 2014 Report unaltered. For the 2018/2020/2022 Integrated Report (also '2018-2022', '2022', or ''22'), assessments were based on 2013-2020 data for rivers/streams, 2015-2018 for lakes/ponds, and 2015-2020 for wetlands, although more recent data was consulted where appropriate. For estuarine/marine waters, assessments for all designated uses other than shellfish harvesting were based on data from 2013-2020, while shellfish harvesting designated use assessments were based on Maine Department of Marine Resources (DMR) classifications as of March 1, 2021. For coastal designated beaches, which are included for the first time in the current report, assessments were based on monitoring data collected during beach seasons 2016-2020, i.e. once EPA had approved the Beach Action Value. For more information, see the section 'Coastal, Marine Beach Recreational Water Quality Monitoring' on page 106, below. The assessment methodology used is provided in Chapter 4. All other sections of this report were updated to reflect the status as of 12/31/20.

In the Integrated Report, Maine waterbodies are assigned to one of five categories (or sub-categories) that describe water quality status (see Chapter 2, Executive Summary, and Chapters 4 and 5). Those waters that are currently listed under Category 5 represent "impaired waters" for purposes of the CWA § 303(d) list, and require development and submission of a Total Maximum Daily Load (TMDL) report or other adequate restoration plan to the United States Environmental Protection Agency (EPA).

The 2018/2020/2022 Integrated Report provides:

- Delineation of water quality assessment units (AUs), identified by their 10-digit Hydrologic Unit Code (HUC) followed by a waterbody-specific code (Appendices II-IV) for rivers/streams, lakes/ponds and wetlands. Marine/estuarine waterbodies (Appendix V) are identified by their 12-digit HUC, supplemented by the relevant

[1] Waters for which DEP received new outside data and those for which the 2014 IR indicated that an update would be provided in the 2016 cycle.

Department of Marine Resources (DMR) Growing Area and classification codes where necessary. Coastal designated beaches (Appendix VI) are identified by 12-digit HUC followed by waterbody class and EPA Beach ID. River/stream, wetland, estuarine/marine and designated beach AUs can be viewed using this ArcGIS Online Project (in development): https://bit.ly/MaineIRMap .

Note that the United States Geological Survey (USGS) has replaced the HUC system with the Watershed Boundary Dataset (WBD) which contains Hydrologic Units (HUs). Because of this conversion, a mismatch now exists between some HUCs used in the IR and current WBD HUs. DEP did not update the HUC part of any AU ID to conform to the new system and is retaining the term 'HUC' to indicate continued usage of the older system.

- Water quality attainment status for river/stream, lake/pond, wetland, marine/estuarine, and coastal designated beach AUs (Appendices II-VI);
- Basis for the water quality standard attainment determinations for river/stream, lake/pond and marine/estuarine AUs, including coastal designated beaches (Chapter 4 and Appendices) and for wetland AUs (Chapter 5 and Appendix IV);
- Identification of AUs requiring a TMDL report or other adequate restoration plan, and either a schedule or priority level for those waters (Chapter 8, Tables 8-14 to 8-18, and Appendices II-VI);
- Identification of waters that are part of Maine's implementation of EPA's '303(d) Vision'.

The 2018/2020/2022 Integrated Report presents State of Maine water quality assessment summaries for that were generated by ATTAINS (Assessment and Total Maximum Daily Load Tracking and Implementation System). ATTAINS is a database developed and maintained by EPA that states use to track and document water quality assessment results. It replaced the IR former database called ADB (Assessment DataBase).

DATA SOURCES AND ACKNOWLEDGEMENTS

Outside Data Request

For each Integrated Report cycle, the Department distributes an outside data request to a list of known water quality data providers such as governmental and non-governmental organizations, tribes, environmental consultants, towns, and academia. The typical text for these requests is shown below in italics in order to differentiate it from other text contained in this Report. For the combined 2018/2020/2022 Integrated Report, the Department distributed three separate requests as follows:

- 2018 Report: a request was e-mailed to approximately 160 contacts from approximately 130 organizations on October 7, 2017 to submit water quality data from the 2015 and 2016 field seasons.
- 2020 Report: a request was e-mailed to approximately 200 contacts from approximately 180 organizations on August 17, 2019 to submit water quality data from the 2017 and 2018 field seasons.
- 2022 Report: a request was e-mailed to approximately 180 contacts from approximately 160 organizations on March 17, 2021 to submit water quality data from the 2019 and 2020 field seasons.

Dear water quality data providers,

I am writing to notify you that The Maine Department of Environmental Protection is now receiving data that has been compiled under an approved Quality Assurance Project Plan for inclusion in the (yyyy) biennial Integrated Water Quality Monitoring and Assessment Report to Congress [the 305(b)/303(d) water quality assessment report].

The Integrated Report provides an assessment of water quality for rivers and streams, lakes and ponds, wetlands, and marine and estuarine resources in Maine, as well as extensive information on the status of Maine's groundwater resources. Prior reports can be viewed at: www.maine.gov/dep/water/monitoring/305b/.

Attached please find a letter that provides background information for this invitation to submit data, and guidelines and required fields for data submission (ME_yyyy-IR_DataRequestLetter.doc). An optional Data Submittal Form is available on request.

***Submissions should be sent to my attention by (month day, year)**. Please do not hesitate to contact me if you have any questions about submissions for the (yyyy) Integrated Report.*

Thank you for your water quality interests and activities.

Susanne

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Integrated Water Quality Reports www.maine.gov/dep/water/monitoring/305b/
Water Quality Standards www.maine.gov/dep/water/wqs/

Sources of River and Stream Assessment Data

The Department generates much of the data for the assessment through the various monitoring programs it conducts, notably the Biological Monitoring Program, Surface Water Ambient Toxics (SWAT) Monitoring Program, the Atlantic Salmon Habitat Monitoring Program, and water quality studies of specific rivers and streams that inform developments of waste load allocations for TMDLs and waste discharge permit limits. Additionally, data are provided by a variety of professional and volunteer monitoring groups. These include other Maine state agencies and resources (Department of Inland Fisheries and Wildlife - MS4, Department of Marine Resources – DMR, Atlantic Salmon Commission, Department of Health and Human Services - DHHS), federal agencies (EPA, USGS, National Park Service), other governmental agencies (Saco River Corridor Commission, St. Croix International Waterway Commission), tribes (Penobscot Nation, Houlton Band of Maliseet Indians) and a number of volunteer watershed groups and conservation organizations that are working cooperatively with Department staff under the Maine Volunteer River Monitoring Program (VRMP) and follow the EPA approved VRMP Quality Assurance Project Plan (QAPP). Long-term VRMP partners are the Androscoggin River Watershed Council, Friends of Merrymeeting Bay, Mousam and Kennebunk Rivers Alliance, Presumpscot Regional Land Trust, and Rockport Conservation Commission. Other groups have participated in certain years. Data are also provided by other groups or consultants that have DEP-approved QAPPs (Midcoast Conservancy, FB Environmental).

Sources of Lake Assessment Data

The Department's Lake Assessment Section manages much of the data collected from lakes within the state. A strong partnership with the Lake Stewards of Maine Volunteer Lakes Monitoring Program (LSM VLMP, Inc.) assures the quality and comparability of the data collected through numerous regional entities and local lake associations. Regional entities include Cobbossee Watershed District, Lakes Environmental Association, St. Croix International Waterway Commission, Allagash Wilderness Waterway, Passamaquoddy Tribe at Indian Township, Penobscot Indian Nation, Portland Water District, Auburn Water District, Acadia National Park, Rangeley Lakes Heritage Trust. Data has also been acquired from private consultants (such as Lake and Watershed Resource Management Assoc., FB Environmental, Biodiversity Research Institute, Florida Power and Light, as part of regulatory requirements) and water utilities that belong to the Maine Water Utility Association. Additional data is acquired through the DIF&W and through cooperative projects with the University of Maine System, Colby College, Unity College, Soil and Water Conservation Districts and similar entities. Data collected under probability-based studies conducted within EPA Region I and as part of the National Lake Assessment Study being conducted by EPA Headquarters is also considered.

Sources of Wetlands Assessment Data

The Department generates most of its assessment data for wetlands through the Biological Monitoring Program (see Chapter 5 for additional information). Wetland monitoring is coordinated with the State's river and stream monitoring using a 5-year rotating basin schedule. Annual wetland monitoring currently focuses on lacustrine and riverine fringe wetlands, including open water marshes, low gradient streams, and shallow habitat of lakes and ponds. The Biological Monitoring Program also considers DEP monitoring and assessment results for associated water bodies (streams, rivers, lakes) in wetland listing decisions. The SWAT Monitoring Program and water quality studies that inform TMDLs provide additional data for wetland assessments on legacy pollutants, toxic substances, nutrients and water level management. Data for wetland losses permitted under Maine's Natural Resources Protection Act and related compensatory mitigation are provided through the DEP Wetland Loss Tracking System maintained by the Bureau of Land Resources.

Sources of Marine Assessment Data

The Department has utilized data for marine assessments from its own environmental and toxics monitoring programs, the Marine Environmental Monitoring Program and SWAT program, as well as the Maine Healthy Beaches Program, which relies on sampling by trained volunteers. Data from the following governmental, academic, and non-profit entities are also used in assessments: Wells National Estuarine Research Reserve (NERR), Maine DMR, New Hampshire Department of Environmental Services (DES), Northeastern Regional Association of Coastal Ocean Observing Systems (NERACOOS), University of Maine, Bowdoin College, BioDiversity Research Institute, and the Casco Bay Estuary Partnership. Additionally, a number of volunteer monitoring groups survey Maine's estuarine and coastal waters, including the Maine Coastal Observing Alliance, Boothbay Region Land Trust, Friends of Casco Bay, Kennebec Estuary Land Trust, Midcoast Conservancy, Mount Desert Island Biological

Laboratory's Community Environmental Health Laboratory, Mousam and Kennebunk Rivers Alliance, Rockport Conservation Commission, and the Spruce Creek Association. The Department currently accepts data from organizations with approved QAPPs whose monitoring programs and analytical labs enable collection and processing of quality data, and from selected organizations with Department-approved sampling plans.

CHAPTER 2 EXECUTIVE SUMMARY, PUBLIC PARTICIPATION AND RESPONSE TO COMMENTS

EXECUTIVE SUMMARY

Surface Waters

Updates to water quality assessments for the 2018/2020/2022 Integrated Report were primarily based on monitoring data collected in calendar years 2013 through 2020 for rivers/streams and estuarine/marine waters, 2015 through 2020 for wetlands, and 2015 through 2018 for lakes/ponds; more recent data was consulted where appropriate. For coastal designated beaches, which are included for the first time in the current report, assessments were based on monitoring data collected during beach seasons 2016 through 2020, i.e. once EPA had approved the Beach Action Value. For more information, see the section 'Coastal, Marine Beach Recreational Water Quality Monitoring' on page 106. The report continues to base assessments for all waterbodies on the five main listing categories that were initially established in the 2002 report. These five main assessment categories are as follows:

Category 1: Attaining all designated uses and water quality standards, and no use is threatened.

Category 2: Attains some of the designated uses; no use is threatened; and insufficient data or no data and information is available to determine if the remaining uses are attained or threatened (with presumption that all uses are attained).

Category 3: Insufficient data and information to determine if designated uses are attained (with presumption that one or more uses may be impaired).

Category 4: Impaired or threatened for one or more designated uses, but does not require development of a TMDL (Total Maximum Daily Load).

Category 5: Waters impaired or threatened for one or more designated uses by a pollutant(s), and a TMDL report is required.

Chaper 4, section Assessment Methodology contains more detailed information on the listing categories and sub-categories.

SUMMARY OF CHANGES

The size and percentage results from the 2016 and 2018/2020/2022 Integrated Reports (Table 2- 1) are not exactly comparable due to changes in assessment methodology and mapping technology over the years and correction of errors, but they provide an approximation of changes in the total amount of waters in each category. For rivers and streams, the mapping technique that is used includes in listed segments any non-riverine portions of a river or stream, such as where it flows through a lake. This leads to an overestimate of the total river/stream length in any category.

For rivers and streams, there were increases in terms of mileage in Categories 2 and 4, and decreases in Categories 1, 3 and 5. A move of five AUs from Category 1 to Category 2 explain the decrease in the former category and most of the increase in the latter. Category 3 decreased by 11 miles as two waters were removed and two added. Category 4 increased by 66 miles as fourteen waters were added. Category 5 decreased by 13 miles as fifteen waters were removed and fifteen were added.

Table 2- 1 reveals that the lakes and ponds of Maine were relatively stable (as a percentage of total assessed waters) with respect to their listing categories over the

period from 2016 to 2022 as only two new listings occurred: Alamoosook Lake (1,133 acres) was moved from Category 2 to Category 5-A, and Otter Pond (25 acres) was moved from Category 1 to 4-C.

For wetlands, there were increased acres listed in Categories 2, 3 and 5 and no changes in Categories 1 and 4. The increases in Categories 2, 3 and 5 were due to new waters being added; two segments in Category 2 totaling 68.64 acres, eight segments in Category 3 totaling 1,560.25 acres, and two segments in Category 5 totaling 172 acres. The remaining increase in Category 2 acreage is the result of previously included waters being entered into ATTAINS and thus newly included in the summations presented in Table 2- 1. Three of the Category 3 waters were listed as a Category 2 in previous assessments, and two of the Category 5 waters were listed as Category 3 in previous assessments.

For estuarine and marine waters, the creation of new Assessment Units in the 2018/2020/2022 report (see pages 96-97) resulted in the separation of shellfish harvesting designated use segments from non-shellfish harvesting designated use ('all other') segments in Categories 2-5. A quantitative comparison of changes in square miles for AUs in these categories from the 2016 cycle to the 2018/2020/2022 cycle will only be possible once a crosswalk table has been completed. Therefore, 2016 areas are not included in Table 2- 1 (except for Category 1). However, the following information is available. For Category 1, there were no changes. For both types of Category 2 waters (for shellfish and non-shellfish harvesting designated uses), Table 2- 1 now comprehensively includes all assessed areas not included in Categories 3-5. In 2016, Category 2 was the sum of only 2 (out of 21) total AUs that had been quantified at that time. For shellfish harvesting designated use segments, waters in Categories 3 and 5[2] have been newly delineated and encompass all areas assessed by DMR for this use. In 2016, Category 3 waters were correctly presented as two AUs according to the listing methodology in use at the time, and Category 5 was an overestimate due to the possible overlap in segment areas between Category 5-B-1 (a), (b) and (c). For non-shellfish harvesting designated use segments, no changes were made to Categories 4 or 5.

Coastal Designated Beaches were assessed for the first time in the current cycle and thus no 2016 numbers are provided below. The table format has been retained for consistency with other waterbody types.

Table 2- 1 Summary of Changes to Surface Water Assessment Categories – 2016 to 2022

Note: '2022' is used as a shorthand for the 2018/2020/2022 cycle. For Rivers and Streams, the Total Miles Assessed do not include waters listed under Category 4-A for atmospheric deposition of mercury; also, this number differs from the total miles of rivers and streams per NHD, see Table 3-1 (~45,000 miles) because the mapping of many AUs is still based on older, lower resolution GIS information, leading to a substantial underestimate of miles assessed.

Rivers and Streams						
35,029 = Total Miles Assessed in 2016						
35,218 = Total Miles Assessed in 2022						
	2016 Miles in Category [1]	**% of Total 2016 Assessed Miles**	**2022 Miles in Category [2]**	**% of Total 2022 Assessed Miles**	**% Change '16 - '22**	**Change in Miles '16 - '22**
Category 1	5,958	17.0	5,277	15.0	-2.0	-681
Category 2	27,343	78.1	28,171	80.0	1.9	828
Category 3	361	1.1	350	1.0	-0.1	-11

[2] For this use, Category 4 waters consist entirely of CSO-impacted waters in Category 4-A; these waters are of undetermined size.

Category 4	417	1.3	483	1.4	0.1	66
Category 5	951	2.9	938	2.7	-0.2	-13
Lakes						
986,952 = Total Acres Assessed in 2016						
986,952 = Total Acres Assessed in 2022						
	2016 Acres in Category	**% of Total 2016 Assessed Acres**	**2022 Acres in Category**	**% of Total 2022 Assessed Acres**	**% Change '16 – '22**	**Change in Acres '16 – '22**
Category 1	295,443	29.9	295,418	29.9	<0.01	-25
Category 2	606,945	61.5	605,812	61.4	0.1	-1,133
Category 3	0	0	0	0	0	0
Category 4	75,915	7.7	75,940	7.7	<0.01	25
Category 5	8,649	0.9	9,782	1.0	0.1	1,133
Wetlands						
6,445 = Total Acres Assessed in 2016						
14,194.5 = Total Acres Assessed in 2022						
	2016 Acres in Category [1]	**% of Total 2016 Assessed Acres**	**2022 Acres in Category**	**% of Total 2022 Assessed Acres**	**% Change '16 – '22**	**Change in Acres '16 - '22**
Category 1	15	0.2	15	0.1	-0.1	0
Category 2	3,870	54.8	6,344.77[4]	44.7	-10.1	2,474.77
Category 3	1,782	35.5	6,933.97	48.8	13.3	5,151.97
Category 4	416 [3]	4.9	388	2.7	-2.2	0
Category 5	362	4.6	512.76	3.6	-1.0	150.76
Estuarine and Marine Waters – Shellfish Harvest Designated Use [5]						
2,875 [6] = Total Square Miles Assessed in 2016						
2,884 [7] = Total Square Miles Assessed in 2022						
	2016 Square Miles in Category	**% of Total 2016 Assessed Square Miles**	**2022 Square Miles in Category**	**% of Total 2022 Assessed Square Miles**	**% Change '16 - '22**	**Change in Square Miles '16 - '22**
Category 1	0.00	0.00	0.00	0.00	0.00	0.00
Category 2			2,490	86.4		
Category 3			356	12.3		
Category 4			0.00	0.00		
Category 5			37	1.3		
Estuarine and Marine Waters – All Other Designated Uses [5]						
2,875 [6] = Total Square Miles Assessed in 2016						
2,889 [8] = Total Square Miles Assessed in 2022						
	2016 Square Miles in Category	**% of Total 2016 Assessed Square Miles**	**2022 Square Miles in Category**	**% of Total 2022 Assessed Square Miles**	**% Change '16 - '22**	**Change in Square Miles '16 - '22**
Category 1	0.00	0.00	0.00	0.00	0.00	0.00
Category 2			2,876	99.5		
Category 3			0.00	0.00		
Category 4 [9]			5	0.2		
Category 5 [10]			8	0.3		
Estuarine and Marine Waters – Coastal Designated Beaches						
0 = Total Miles Assessed in 2016						
39.02 = Total Miles Assessed in 2022						
			2022 Miles in Category	**% of Total 2022 Assessed Miles**		
Category 1			0.00	0.00		
Category 2			36.99	95		
Category 3			1.21	3		
Category 4			0.00	0.00		
Category 5			0.82	2		

[1] Single-Category Reporting miles as generated by 2016 cycle ADB.
[2] Single-Category Reporting miles as generated by 2022 cycle ATTAINS.

[3] There was an error in calculating the 2016 Category 4 Acres, should have been listed as 388 acres.
[4] Excludes AUs in Cat 2 where default value of 0.1 acres is entered in ATTAINS
[5] For the first time in the 2022 cycle, estuarine and marine waters (not including Coastal Designated Beaches) are assessed separately for attainment of the Shellfish Harvest designated use and "All Other" designated uses. As such, total area and area assessed per category are presented separately.
[6] This value was carried forward from 2014 instead of updating it to a summation of 2016 Categories 2-5. Such a summation would have resulted in a significant underestimate of total acres assessed due to the significant underestimate of Category 2 waters.
[7] This value represents the area regulated by the Maine Department of Marine Resources for shellfish harvest.
[8] This value includes a more accurate area of state jurisdictional estuarine and marine waters generated during the creation of new assessment units for the 2022 cycle.
[9] Variable additional miles due to Combined Sewer Overflow waters.
[10] All estuarine and marine waters capable of naturally supporting lobster propagation are affected by a shellfish (lobster tomalley) consumption advisory due to the presence of PCBs and dioxins. A statewide marine consumption advisory for several saltwater finfish and shellfish species is also in effect based on elevated mercury, PCB and dioxins. Category 5 acreage does not include marine waters under these statewide consumption advisories.

All freshwaters in Maine are listed for an impaired Fish Consumption Use caused by mercury from sources beyond the region; river and stream miles and lake acres affected by this statewide listing are not recorded in Table 2- 1. These waters were listed in Sub-Category 5-C in the 2006 Integrated Report. On December 20, 2007, EPA approved a Regional Mercury TMDL, which allowed these waters to be moved to Category 4-A in the 2008 cycle. The New England States and New York developed the Regional Mercury TMDL to address mercury impairments caused by sources outside the Region. The State of Maine has already taken aggressive action to reduce sources of mercury within the State's jurisdiction. Further action will be required from sources outside the State's boundaries to provide the desired reduction of mercury in Maine's waters. Category 5-D, Legacy Pollutants, includes many mainstem river segments that are listed for non-attainment of the Fish Consumption Use due to PCBs in fish tissue.

GROUNDWATER

Groundwater Programs are described in Chapter 6. Responsibility for groundwater resource assessment and protection is shared amongst the DEP, the Department of Health and Human Services' (DHHS) Division of Environmental Health, the Maine Geological Survey (MGS) in the Department of Agriculture, Conservation, and Forestry (DACF), and the U. S. Geological Survey (USGS). Other agencies, such as the Department of Transportation (DOT), DACF - Agricultural Compliance Program may investigate groundwater contamination problems in certain areas and undertakes management practices designed to reduce the risk of harm to groundwater quality.

Ambient monitoring refers to large-area, long-term monitoring conducted to obtain trend information on groundwater quality or quantity. MGS and USGS carry out these types of monitoring projects under several cooperative agreements. MGS and USGS maintain a statewide network of groundwater observation wells to track changes in water quality and quantity.

Major impediments to effective groundwater protection in Maine include a lack of data to quantify the impact of some nonpoint pollution sources, and general public unfamiliarity with key groundwater concepts and issues. Public misconception about groundwater is probably the major factor contributing to degradation of this resource. The development of a comprehensive and accessible database for water data

(Environmental and Geographic Analysis Database, EGAD) has increased the accessibility of the wide variety of data collected on water quality by various state agencies. Continuing use of this database will improve operations at the agencies responsible for groundwater protection and assessment, and allow access to data on which to base educational efforts to increase the public's awareness of groundwater issues. Relative to groundwater protection, the principal uses of this database are to (1) help design clean-up strategies in areas of known contamination; (2) plan future development that provides for better protection of public health and safety; (3) assist in prioritizing protection of sensitive groundwater and surface water bodies, wetlands, and other resources; (4) enhance understanding of the spatial relationships between water resources and population as they relate to potential or known pollution sources; and (5) assess the flow and transport interrelationships between ground- and surface water, in order to evaluate groundwater impacts on surface water bodies and on groundwater-dependent habitat.

PUBLIC PARTICIPATION

Process to Solicit Public Comments

The following subsections detail the actions taken by the Department to promote the public's knowledge of the existence and availability of the draft version of the 2018/2020/2022 Integrated Water Quality Monitoring and Assessment Report [Integrated Report or Report, formerly known as the 305(b) Report] and to solicit comments from the public on the contents and conclusions of the draft report. The official period of time that the draft Report was available for public comment was from January 19, 2022 to 5:00 pm on February 21, 2022.

In addition to the public comment process outlined below, the draft Report was reviewed internally by Department staff and by EPA staff.

REPORT POSTING ON THE DEPARTMENT'S WEBSITE

On January 19, 2022, the Department opened public comment period for the draft 2018/2020/2022 Integrated Report with a posting on the Department's Opportunity for Comment webpage: www.maine.gov/dep/comment/. The text that accompanied the posting follows and is italicized in order to differentiate it from other text contained in this Report.

Opportunity for Comment

Draft 2018/2020/2022 Integrated Water Quality Monitoring and Assessment Report

The Maine Department of Environmental Protection has prepared the draft "2018/2020/2022 Integrated Water Quality Monitoring and Assessment Report" for submission to the U.S. Environmental Protection Agency (EPA) as required by §§ 303(d) and 305(b) of the Clean Water Act, and in fulfillment of the reporting requirements of 38 M.R.S. § 464(3)(A) of the State of Maine's Water Classification Program. This report is available for public comment until 5:00 PM, February 21, 2022. For more information and access to the documentation (2 files), please visit www.maine.gov/dep/water/monitoring/305b/. Reviewers of the Report document should pay particular attention to the listing methods required by the EPA for surface water

assessments in this report. These methods are described in Chapter 4 of the document. Specific waterbody attainment and impairment assignments can be found in the Appendices.

Comments become part of the public record and are published in the final version of the Report. All comments should be sent to:

By email: IRcomments.DEP@maine.gov
By fax: 207-287-7826

Susanne Meidel
Maine Department of Environmental Protection
Bureau of Water Quality
State House Station 17
Augusta, ME 04333-0017
www.maine.gov/dep/comment/

The Department offers subscription services for a variety of DEP publications and announcement. The public comment notice for the draft 2018/2020/2022 Integrated Report was e-mailed to subscribers to public comment opportunities and to rulemaking changes. Hard copies of the draft report were made available to the public on request.

MAILING TO INTERESTED PARTIES

During the week January 17, 2022, approximately 1,250 interested parties (e.g. towns, non-governmental organizations, tribes, State agencies, permittees) were notified of the comment period for the draft Report via direct e-mail. The notification was also posted to three listserves with approximately 1,360 subscribers. The text of that notice follows and is italicized in order to differentiate it from other text contained in this Report.

Maine's DRAFT 2018/2020/2022 Integrated Water Quality Monitoring and Assessment Report

Available for Public Comment until February 21, 2022

The Maine Department of Environmental Protection has prepared the draft "2018/2020/2022 Integrated Water Quality Monitoring and Assessment Report" for submission to the U.S. Environmental Protection Agency (EPA) as required by §§ 303(d) and 305(b) of the Clean Water Act, and in fulfillment of the reporting requirements of 38 M.R.S. § 464(3)(A) of the State of Maine's Water Classification Program.

This report is available for public comment until 5:00 PM on February 21, 2022. For more information and access to the documentation (2 files), please visit www.maine.gov/dep/water/monitoring/305b/ . Reviewers of the Report document should pay particular attention to the categories and listing methods required by the EPA for the surface water assessments in this report. These methods are described in Chapter 4. Specific surface waterbody attainment and impairment assignments can be found in the Appendices (a separate file). The appendices are broken into five waterbody types: rivers/streams, lakes/ponds, wetlands, estuarine and marine waters, and coastal designated beaches. Categories 1-3 are for

waters that are not impaired, categories 4 and 5 are for waters or water segments that are impaired for one or more uses.

We encourage you to review the document and provide comment on the report. Comments become part of the public record and are published in the final version of the Report. All comments should be sent to:

By email: IRcomments.DEP@maine.gov
By fax: 207-287-7826

Susanne Meidel
Maine Department of Environmental Protection
Bureau of Water Quality
State House Station 17
Augusta, ME 04333-0017

Susanne.K.Meidel@maine.gov

LEGAL NOTICE

During the week of January 17, 2022, the Department published a legal notice in four daily and three weekly newspapers around the state. Those newspapers were as follows: Bangor Daily News, Kennebec Journal, Lewiston Sun Journal, Portland Press Herald (daily), and The Star-Herald, Aroostook Republican and Houlton Pioneer Times (weekly). The text of the legal notice follows and is italicized in order to differentiate it from other text contained in this Report.

Legal Notice

Maine Department of Environmental Protection

Notice of Public Comment Opportunity for the Draft "2018/2020/2022 Integrated Water Quality Monitoring and Assessment Report"

The Department of Environmental Protection has prepared the draft "2018/2020/2022 Integrated Water Quality Monitoring and Assessment Report" for submission to the U.S. Environmental Protection Agency (EPA) as required by §§ 303(d) and 305(b) of the Clean Water Act, and in fulfillment of the reporting requirements of 38 M.R.S. § 464(3)(A) of the State of Maine's Water Classification Program. This report is available for public comment until 5:00 PM, February 21, 2022. For more information and access to the documentation (2 files), please visit www.maine.gov/dep/water/monitoring/305b/. Reviewers of the Report document should pay particular attention to the listing methods required by EPA for surface water assessments in this report. These methods are described in Chapter 4 of the document. Specific waterbody attainment and impairment assignments can be found in the Appendices.

Comments become part of the public record and are published in the final version of the Report. All comments should be sent to:

By email: IRcomments.DEP@maine.gov
By fax: 207-287-7826

Contact:
Susanne Meidel
Maine Department of Environmental Protection
Bureau of Water Quality
State House Station 17
Augusta, ME 04333-0017

Summary of Public Comments and Responses

The Department received 10 comments during the official public comment period and wishes to thank all individuals and organizations for their input. In the interest of brevity and clarity, comments are paraphrased and combined as indicated. Comments are listed below in the order received and presented in italic typeface, followed by the DEP response.

MAINE FOREST SERVICE EFFORTS

Paraphrased comment from:

- Tom Gilbert, Maine Forest Service (DACF)

To provide a more complete picture of the regulatory landscape, please consider mentioning the delegation of permit-granting authority to other agencies. For example, the provisions of NRPA affecting timber harvesting and related activities are administered and enforced by the Maine Forest Service (MFS). MFS Chapter 21 and Chapter 27 rules are a result of this delegation from DEP to MFS.

Also, MFS has a robust statewide monitoring effort for forestry BMPs and NPS pollution conducted annually which may be relevant to your report. You may find copies of these reports from 2005 – 2019 on our website:

www.maine.gov/dacf/mfs/policy_management/water_resources/bmps.html.

DEP Response:

A reference to MFS Chapter 21 and 27 rules was incorporated into the section 'Land Use and Growth Management' on pages 38-39, below. Likewise, a reference to the 2005-2019 MFS reports regarding BMPs and NPS pollution was incorporated into the section 'The Maine NPS Water Pollution Control Program' on page 35, below.

IMPAIRED LISTING FOR KENNEBUNKPORT BEACHES

Paraphrased comment from:

- John Kraeuter, volunteer with Maine Healthy Beaches (MHB) program at Goose Rocks Beach (GRB)

I am writing because of my concern with the recent listing of two sites (Batson River – Goose Rocks Beach and Little River – Goose Rocks Beach) as impaired. The listings are in accordance with the criteria presented in the draft report; however, I believe that the public reading your report needs to be given more information concerning the science behind this decision. This is important because it affects the public's

impression of the area, may have direct economic effects, and it also causes added burdens on the town officials who need to respond to the public's questions. I think, at the very least DEP should be providing a thorough analysis of the data collected by MHB in cooperation with the town and how it should be used as a supplement to the listing.

I note the following points:

1. *Studies within the system have not revealed any point sources, and thus it is likely we are dealing with nonpoint sources for the high bacterial loads.*
2. *As with all areas: when there is rainfall the bacterial numbers increase.*
3. *Data collected from the stations at the mouths of the two tidal river systems are strongly affected by the tidal stage (high vs low), the lunar tidal systems (Spring vs Neap).*
4. *Little has changed with respect to the bacterial numbers at the monitoring stations (Beach or marsh) and at the additional stations in the marshes surrounding the river systems since they were first sampled in 2004 and 2005, respectively.*
5. *In addition to the base monitoring at GRB, MHB and the Town have funded additional studies in the marsh systems (2005, and 2018-2021), and some of these areas have consistently shown high levels of Enterococcus suggesting that marshes may be a nonpoint source of the bacteria.*
6. *The MHB program and the Town of Kennebunkport have instituted a limited examination for human and other DNA. Nine of 12 samples (out of a total of 123) that tested positive were from a rainfall event (0.99 in) and 3 have potential explanations. In 2021, there were no positive samples indicating human contamination.*
7. *Shellfish harvest standards are stricter than those used for human contact, and given that significant portions the Little River, and Batson River from approximately its junction with Smith Brook to the ocean, are open for clamming (in 2021, the open portion of the Batson was seasonally closed from June through September), suggests that impaired may be too strong a classification.*

Furthermore, the above efforts should be placed in context to the pertinent conclusions in the scientific literature relative to enterococcal numbers, sampling and human health risk:

1. *A basic analysis of MHB data from GRB will show that, in addition to rainfall, the levels of enterococcal bacteria at the two river systems is highly correlated with samples taken within an hour or two of low tide, especially during Spring tide conditions. EPA (2010) found that spring tides are often associated with elevated bacteria levels* ***regardless*** *of proximity to known point sources of fecal pollution and thus may not have a direct relationship to sources of fecal pollution*
2. *Studies (Donahue et al. 2017) have shown that enterococcal numbers can be elevated when abundant organic material is present, and that waters draining from marsh systems naturally have higher levels of enterococci and other bacteria.*
3. *The scientific literature (Cabelli et al. 1983; Colford et al. 2007) is relatively clear, Enterococcus is useful as an indicator of human health risk when there is human waste entering the system. Epidemiological studies have shown that when that component is very low or missing there is no correlation between Enterococcus numbers and human health risk in marine systems.*

*These studies and others question whether enterococci were the appropriate standard for bathing water quality **near coastal wetlands** with nonpoint sources, and may indicate that the GRB marsh systems are functioning the way nature intended, and, as long as human waste is not entering the system, there is low risk to human health. This also implies that there may be no solution to the elevated enterococcal numbers exiting the marshes at low tide.*

In my view, it is ok to list the two GRB river systems as impaired as long as the impairment is placed in the appropriate context, and not based on just a simple percent occurrence calculation without examining in the document the many other relevant factors. This is an important aspect to be sure that when such data are communicated to the public it provides the information in an accurate manner.

References:

Cabelli V.J, A.P. Dufour, L.J. McCabe, and M.A. Levin MA. 1983. A marine recreational water quality criterion consistent with indicator concepts and risk analysis. J. Water Pollut. Cont. Fed. 55:1306 -1314.

Colford, J.M. Jr., T.J. Wade, K.C. Schiff, C.C. Wright, J.F. Griffith, S.K. Sandhu, S. Burns, M. Sobsey, G. Lovelace and S.B. Weisberg. 2007. Water quality indicators and the risk of illness at beaches with nonpoint sources of fecal contamination. Epidemiology 18(1):27-35

Donahue, A., Z. Feng, E. Kelly, A. Reniers and H.M. Solo-Gabriele. 2017. Significance of beach geomorphology on fecal indicator bacteria. Mar. Poll. Bull. 121:160-167.

EPA 2010. Sampling and Consideration of Variability (Temporal and Spatial) For Monitoring of Recreational Waters. U.S. Environmental Protection Agency Office of Water, EPA-823-R-10-005.

DEP Response:

Several of the points raised by the commenter are acknowledged in relevant Integrated Report (IR) sections; for example, the involvement of nonpoint sources and precipitation events in causing impairments at GRB are noted (page 100: "… MHB's historical data demonstrates a relationship between antecedent precipitation and observed bacteria exceedances at these impaired beaches. This suggests that nonpoint source pollution likely contributed to these impaired listings…").

Maine DEP evaluates marine recreational water contact safety using an EPA-approved Maine Beach Action Value (BAV) that is based on the use of *Enterococcus* bacteria. The ME DEP methodology for IR assessments (pages 59-60) evaluates the percent of time a beach exceeds the *Enterococcus* bacteria BAV. This assessment methodology does not provide for a distinction based on the sources that contributed to the elevated bacteria values. Understanding bacteria sources can be useful when prioritizing investigation and management efforts, but this information is not used to determine impairment status.

Sources of bacteria can be difficult to identify and eliminate. Coastal beaches and wetlands are complex systems where the regrowth and persistence of bacteria in the environment further confounds the understanding of observed bacteria levels and possible fecal pollution sources. The Town of Kennebunkport, with partners, has been working for several years to address water quality impairments in the GRB watershed; some of this work is ongoing. To acknowledge these efforts, a reference to this work was included on page 100 below where the impaired listings are presented.

Efforts have included investigating, identifying, and removing sources of human wastewater discharges (i.e. those from private septic systems and municipal sewer), assessing wastewater and stormwater infrastructure, and expanding local public education and outreach initiatives. The monitoring and investigative work from 2018-2019 is summarized in the ME DEP report titled *Summary Report of Enhanced Monitoring of Pollution Source Tracking Efforts in the Goose Rocks Beach Watershed, Kennebunkport, Maine*, which can be found on the Town of Kennebunkport website (www.kennebunkportme.gov/public-health-department/pages/maine-healthy-beaches-and-water-quality). The report documents the use of methods to identify sources of fecal bacteria in the watershed. Results of these efforts identified human as well as domestic and wild animal fecal matter in the watershed and at beach sites.

Elevated bacteria in the GRB watershed have also been documented by the Maine Department of Marine Resources (DMR). Water quality monitoring has been performed by DMR in the GRB watershed for over 50 years to evaluate the safety of shellfish consumption and the health of the growing waters in the area. Since the late 1990s, portions of the GRB watershed have been variously classified by DMR as Conditionally Approved, Restricted, or Prohibited to shellfish harvesting due to elevated bacteria, which supports the ME DEP assessment.

WATER QUALITY MONITORING AND SEPTIC SYSTEM INSPECTION

Paraphrased comment from:

- Bailey Bowden, Bagaduce River Monitor[3]

All marine water quality assessments are conducted by the Maine Department of Marine Resources (DMR), Bureau of Public Health (BPH). However, those staff have no authority to enforce DEP rules and laws pertaining to water quality, especially non-functioning private septic systems. I recently contacted DEP for information regarding a triennial survey, shoreline survey, or confirmation that a private septic system had been remediated. I was told that the DEP lacked staff to do any of these items. The BPH has over 24 staff members but are not authorized to perform these duties as they fall under DEP rule or law. I would like to suggest that the BPH be moved into the DEP making all water quality staff housed under one program.

DEP Response:

It is correct that the DMR BPH carries out certain water quality assessments. The BPH oversees the application of the National Shellfish Sanitation Program within the State of Maine (www.maine.gov/dmr/shellfish-sanitation-management). This program is implemented in order to keep molluscan shellfish safe for human consumption. The DEP uses DMR data to assess whether the shellfish harvest designated use provided in Maine law for estuarine and marine waters is attained (38 M.R.S. Section 465-B), see 'Shellfish propagation and harvest', pages 61-63, below. The DEP, on the other hand, monitors water quality (for example, levels of dissolved oxygen or pH; eelgrass abundance and health) to determine whether the aquatic life designated use is attained.

Private septic systems are under the purview of the Maine Department of Health and Human Services, within the Maine Center for Disease Control & Prevention (CDC), Division of Environmental and Community Health, Drinking Water Program,

[3] Mr. Bowden also submitted a comment regarding fish passage impairments, see pages 22-24.

Subsurface Wastewater Program, which delegates inspections to Local Plumbing Inspectors. These Inspectors are the persons with the "Authority Having Jurisdiction", and all complaints and concerns should go through them first**.** Failing septic systems are a public health issue first and a water quality problem second, thus the CDC takes the lead on these systems. The commenter is advised to contact the local plumbing inspector to discuss his concerns regarding the private septic system in question.

CAPISIC POND AND WATER QUALITY MONITORING IN PORTLAND

Paraphrased comment from:

- Doug Roncarati, City of Portland, Stormwater Coordinator

In my review of the draft Integrated Water Quality Report, at the top of page 100 of the Appendices in the Comments section for Capisic Brook I noticed a pair of errors that should be corrected. It was stated twice that the Capisic Brook Watershed Restoration Project was completed in 2016. That is incorrect. The Capisic Pond Restoration Project was completed in 2016. This project was at the receiving waters of the brook and was not intended to restore the watershed, only to improve wildlife habitat and recreational uses at the pond. The Capisic Brook watershed management/restoration plan was approved by the City in 2012 and is an ongoing effort.

In the spirit of collaboration, we were wondering if it would be possible for the DEP to notify us when it was planning to conduct water quality monitoring in Portland and the location of the monitoring sites? We might be able to provide some additional information about the sites or site selection guidance for new sites based on our knowledge of our systems and watersheds. Also, we would appreciate it if you would share the data you collect with the City to help us improve our understanding of the condition of these surface waters and any stressors impacting water quality.

DEP Response:

The comments section for the stream segment of Capisic Brook (ID ME0106000105_610R01) referred to a Section 319-grant project, which was completed in December 2016. The comments were adjusted to provide additional details to clarify this reference. The information regarding the Capisic Pond Restoration Project was added to the Capisic Brook wetland segment (ID ME0106000105_610R01_W023, page 187 in the Appendices).

DEP's Watershed Management Unit makes every effort to share its monitoring plans and data with the City of Portland. Most of the monitoring in Portland streams is conducted by DEP's Biomonitoring program, which operates on a five-year basin rotation schedule. Since the next Southern Maine monitoring is scheduled for 2025, we would encourage the City to contact DEP's Watershed or Biomonitoring program staff in the spring of that year to find out about and coordinate on any Portland sites scheduled for monitoring. For information on sampling events and data, the City may consult the Biomonitoring ArcGIS Online project where this information is available (with a lag time of 1-2 years).

CATEGORY 4-C IMPAIRMENTS FOR FISH PASSAGE PROBLEMS

Some of the comments received overlapped in content. In the interest of brevity and succinct presentation, recurrent arguments were combined and paraphrased.

Paraphrased comments from:

- Bailey Bowden, Bagaduce River Monitor
- Steve Heinz, Trout Unlimited (TU), Maine Council
- Landis Hudson, Maine Rivers
- Ivy Frignoca, Friends of Casco Bay (FOCB)
- Dwayne Shaw, Brett Ciccotelli, Downeast Salmon Federation (DSF)
- John Burrows, Atlantic Salmon Federation (ASF), Maine Council
- Upstream (Dan Auclair)

- ***Background on previous request and listings****:*
  - *In a letter dated June 13, 2017, Maine Rivers brought fish passage impairments to the Department's attention hoping that the 2022 Integrated Report would include more progress toward identifying non-attaining waters in this category.*
  - *ASF recognizes and applauds the Department for acknowledging fish passage related WQ impairments in two particularly egregious situations on segments of two Maine rivers (lower Androscoggin at Brunswick Dam; lower Mousam River). Assessing the scale of the problem and working to address it will take time and effort, but the work needs to be done.*
- ***Indigenous aquatic species and original ranges****: Indigenous sea-run fish species (and freshwater fish like Eastern brook trout) have not been restored to original ranges and continue to be denied access to critical habitat in their former range by the presence of man-made structures, principally hydroelectric dams. Of greatest concern is the present state of Atlantic salmon restoration (only very small remnant populations exist) primarily due to dams with no or inadequately performing fish passage measures. This profoundly impacts those individual species and has ripple effects across the landscape since these fish play important ecological roles in the freshwater, estuarine, and marine environments and are thus intrinsically linked to water quality. Therefore, the absence of a native fish community in historic habitat should be considered an impairment of water quality. As a specific example, sea-run fish like alewives have been completely blocked by the first dam on Cobbossee Stream, the Gardiner Paperboard Dam. By providing fish passage, eels, once numerous in the watershed, could start to recover their populations and many other species would benefit as well.*
- ***Natural stream function of providing critical habitat****: For example, many tributaries to Casco Bay fail to perform natural functions of providing critical habitat to diadromous species and native freshwater species because barriers break the natural and elemental connections between fresh and marine systems, reducing biodiversity, destroying habitat, and degrading water quality. This is in contravention of the Clean Water Act's mandate that our waters support and restore native fisheries.*
- ***Nutrient exchange****: Sea-run fish deliver critical marine derived nutrients to rivers and streams, which directly impacts stream productivity and the benthic macroinvertebrate community. Nutrients are also exported out of freshwater ecosystems by sea-run fish such as emigrating juvenile alewives. A lack of*

upstream fish passage at a dam prevents sea-run fish production and disrupts natural nutrient transport in both directions, which directly impacts the chemical integrity of our waters, affecting co-evolved species of birds (e.g. eagles), animals (e.g. otters), and the forest (including hemlocks). Breaking these pathways that allow for the biological and chemical exchange of nutrients from the marine to the terrestrial environment means that waterbodies are not living up to their legally protected potential.

- ***Filter-feeding freshwater mussel****: Various sea-run and resident freshwater fish species transport larval freshwater mussels (such as Alewife Floater, Anodonta implicata) to upstream habitats so distribution, diversity, and abundance of these mussels in freshwater ecosystems is partly dependent on ability of fish to migrate upstream of dams. Freshwater mussels perform a natural cleansing function by filtering water but this function has been disrupted with impacts on water quality.*
- ***Silt and gravel and redds****: Silt and gravel are required for many anadromous fish, like Atlantic salmon, brook trout and sea lamprey to build their breeding nests called redds. Dams prevent these materials from travelling downstream, leaving only cobble or ledge below dams, and degrading the water quality and ecological health of a waterway.*
- ***Negative economic impact****: In 2020, the elver fishery generated over five million dollars of income and the river herring fishery provided 1.5 million pounds of lobster bait. Dams without fish passage have taken thousands of acres of spawning habitat out of production, which has impacted the sustainability of these natural resources, causing enormous negative economic impact.*
- ***Vital connections between marine and freshwater systems****: As explained above, the numerous dams in Maine without fully functional fish passage break vital natural and elemental connections between marine and freshwater systems. This condition exerts significantly negative impacts on our waters by degrading water quality, reducing biodiversity and destroying habitat in contravention of the Clean Water Act's mandate that our waters support and restore native fisheries. In addition, Maines's Water Classification Program in Title 38 §464.1 states that "*… it is the State's objective to restore and maintain the chemical, physical and biological integrity of the State's waters…*".*
- ***Waters proposed for listings***
  - *The health of Maine's ecosystems depends upon functioning aquatic systems and we ask that the following impaired listings be created in Category 4-C: Impairment not caused by a pollutant:*
  - *Any dam that is situated on a Maine river that does not provide fish passage. (Bailey Bowden)*
  - *All Maine waters where it can be definitely established by fisheries commission reports from the 1800s that Atlantic salmon and their coevolved indigenous fish species such as river herring and American shad were historically present, and where they are currently absent or their numbers are severely reduced due to the presence of dams (includes the West Branch of the Penobscot from above Medway to Penobscot Brook, the Kennebec River from above Waterville to below Harris Dam, the Androscoggin to Rumford Falls, the Saco River to the Swan Falls Dam, and many smaller waters including the Union and Royal rivers) - relatively straightforward requiring relatively little expenditure of state agency resources, will provide much more accurate description of degree of impairment due to presence of dams, and one that is more closely aligned with the intent of the Clean Water Act. (TU)*

- *Dams that completely lack functional fish passage and have historical documentation of native sea-run species below each dam (Stroudwater River above Stroudwater dam, Portland; Presumpscot River above Mallison Falls dam, Westbrook; Little Medomak Stream above Lasall dam, Washington; Cobbosseecontee Stream above Gardiner Paperboard dam, Gardiner; Kennebec River above Shawmut dam, Fairfield; Union River above Union River dam, Ellsworth; Megunticook River above Montgomery dam, Camden; Orange River above Mill Pond Stone dam, Whiting; Aroostook River and Meduxnekeag River due to fish passage problems downstream and across the border in New Brunswick, Canada on the Wolastoq / St. John River). (Maine Rivers)*
- *Any river, stream or brook where dams lack functional fish passage; for Casco Bay watershed, include: Stroudwater dam, Stroudwater River, Portland; Presumpscot River above Mallison Falls dam, Westbrook; and Royal River, Bridge Street dam and East Elm Street dam, Yarmouth. (FOCB)*
- *Megunticook, Goose, and Little Rivers, Union River above the Ellsworth Dam, West Branch of the Pleasant River, Machias's Middle River, and Orange River. (DSF)*
- *Segments of waters above dams that lack fish passage (ASF)*
- *Cobbossee Stream (Upstream)*

DEP Response:

In response to Maine River's June 2017 letter, Department staff began investigating approaches to develop fish passage listings in 'Category 4-C: Impairment not caused by a pollutant', for inclusion in the 2018 Integrated Report. Due to other competing priorities, this work, and work on the 2018 and 2020 Integrated Reports, stalled. In the summer of 2021, investigations to develop a methodology for fish passage listings and specific listings re-started with internal conversations and consultations with staff from DMR and the originators of the 2017 letter. This effort proved to be too complex and difficult to complete in time for inclusion in the 2018/2020/2022 Report. Therefore, the Department opted to not create any listings in this cycle, and decided to defer future listings to the 2024 cycle, for which the Department plans to develop a new methodology in collaboration with Maine fisheries agencies. Outreach to these agencies has begun; consultations with stakeholder groups such as the parties listed above will occur as appropriate.

CHAPTER 3 BACKGROUND

STATE ATLAS

Contact: Vicki Schmidt, DEP, BWQ, DEA

Tel: (207) 485-1482 email: Vicki.L.Schmidt@maine.gov

The State of Maine has a total surface area of over 32,000 square miles and is the largest state in New England. Maine's terrestrial lands occupy almost 27,000 square miles, and wetlands and surface waters occupy nearly 5,580 square miles. Tidal rivers and estuarine and marine waters represent an additional 2,900 square miles. With a 2020 US Census population of 1.36 million citizens, representing a 2.6% increase since the 2010 US Census, Maine is the 42nd most populous state and also the least densely populated state east of the Mississippi. Due to geographical characteristics regional population densities vary considerably from the state's average population density. Population densities in the northern and most Down East organized sections of the state average less than 30 citizens per square mile, while many southern and central portions of Maine host over 20,000 citizens per square mile. The majority of Maine's population is concentrated in the southern and central coastal portions of the State, and along both sides of Interstate 95 south of Bangor. Approximately 61% of Maine residents live in rural areas and the remaining 39% in urban and urbanized areas.

There are more than 32,000 lakes, ponds and reservoirs in Maine covering over 1,000,000 acres, an area that is larger than the State of Rhode Island. There are over 7,000 perennial streams and rivers in Maine, ranging in length from less than two miles to nearly 200 miles, with a total length of ~45,000 miles. Land use in Maine is shown in Table 3-1 below.

Since 2009 Maine has been developing hydrography and GIS-related water programs utilizing the National Hydrography Dataset (NHD). NHD has significantly increased the accuracy of efforts to measure and categorize Maine's coastline, rivers, streams, lakes and ponds. Additionally, access to modern and updated high-resolution aerial photography has improved Maine's ability to determine land use and both human-caused and naturally occurring changes to our state's terrestrial conditions.

Table 3- 1. The 2022 Integrated Report State of Maine AtlasThe 2022 Integrated Report State of Maine Atlas

Land use. Sources: Total State Area - State Boundary dataset; land uses – C-CAP (Coastal Change Analysis Program) 2016 at 30 m resolution.

Description	Square Miles
Total State Area	32,423
Total Forested & Scrubland	24,234
Total Non-Forested Terrestrial (crops, pasture, other)	1,695
Total Developed and Paved Ways	913
Total wetlands	5,580
Total open water (non-marine/estuarine)	1,627

Rivers and Streams, and Boundary Waters. Source USGS National Hydrography Dataset (NHD) 2019; scale: 1:24,000 or better.

Description	Miles
Total Miles of Rivers and Streams (non-estuarine portion)	45,008
Miles of perennial rivers/streams	31,608
Miles of intermittent streams	13,400
Miles of ditches/canals	17
Total Miles of Rivers and Streams by Water Class	44,640
Miles of Class AA waters (6.3%)	2,797
Miles of Class A waters (47.2%)	21,056
Miles of Class B waters (45.4%)	20,261
Miles of Class C waters (1.2%)	526
Total Miles of Coastline (including tidal rivers & shorelines of islands)	2,756
Total Miles of Border Coast, Lakes and Rivers Shared with CN and NH [1]	339
Maine – Canadian Border (coastal water miles out to the "3-mile" limit)	39
Maine – Canadian Border (lake miles)	33
Maine – Canadian Border (river miles)	206
Maine – Canadian Border (total water miles) [1]	279
Maine – Canadian Border (total land and water miles)	*609*
Maine – New Hampshire Border (coastal water miles out to the "3-mile" limit)	17
Maine – New Hampshire Border (lake miles)	18
Maine – New Hampshire Border (river miles)	25
Maine – New Hampshire Border (total water miles) [1]	**60**
Maine – New Hampshire Border (total land and water miles)	*189*

[1] Derived from State boundary dataset (Source: MEGIS).

Lakes, Ponds & Reservoirs. Source: USGS National Hydrography Dataset (NHD); scale: 1:24,000 or better.

Description	Acres	Square Miles	Number
Total lake, pond & reservoir features in Maine DEP's GIS datalayer	1,025,949	1,603	32,257
Lakes, ponds & reservoirs assigned a MIDAS number in DEP's GIS	988,508	1,544	6,186
Lakes, ponds & reservoirs assigned a MIDAS Number tracked in ATTAINS[1]	986,952	1,542	5,780
Significant publicly owned lakes, ponds & reservoirs (subset of line above)[2]	958,977	1,477	2,313

[1] Only lakes, ponds and reservoirs with a MIDAS number are tracked in ATTAINS. MIDAS is a unique identification number assigned to Maine lakes and ponds monitored and managed by Maine state agencies.

[2] Significant Lakes are defined under CWA § 314 as publicly owned, have bathymetric/morphometric surveys, vulnerability modeling was performed, or some trophic data has been gathered.

Nearshore Waters and Tidal Rivers. Source: USGS National Hydrography Dataset (NHD) 2019; scale: 1:24,000 or better and Maine Statutory Water Classification layers, 2021.

Description	Acres	Square Miles
Navigable Harbors	90,124	140
No Discharge Areas (NDAs)	179,030	280
Total Area of Estuaries/Harbors/Bays	1,848,832	2,889
Total Area of Estuaries/Harbors/Bays by Water Class	1,848,832	2,889
Area of Class SA waters (10%)	181,331	283
Area of Class SB waters (89%)	1,649,696	2,578
Area of Class SC waters (1%)	17,805	28

Wetlands. Source: U.S Fish and Wildlife Service National Wetland Inventory (NWI) dataset – updated; scale: 1:24,000 or better.

Description	Acres	Square Miles
Estuarine intertidal (NWI E2)	3,709	128
Marine intertidal (NWI M2)	3,146	108
Freshwater wetlands (NWI Palustrine)	90,486	3,114

WATER QUALITY STANDARDS PROGRAM

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Related Websites: www.maine.gov/dep/water/monitoring/classification/ and www.maine.gov/dep/water/wqs/

The quality of Maine's water is described in terms of physical, chemical and biological characteristics defined under the state's water classification program. As established in Maine statute (38 M.R.S. §§ 464-470), the classification program consists of designated uses (e.g. drinking water supply, recreation in and on the water, habitat for fish and other aquatic life), criteria [e.g. bacteria, dissolved oxygen (DO) and biological criteria] and anti-degradation provisions which together specify levels of water quality necessary to maintain the designated uses. All State waters have a classification assignment (rivers and streams: AA, A, B, C; lakes: GPA; marine and estuarine waters: SA, SB, SC). Wetlands are classified the same as associated surface waters, i.e. wetlands that are part of great ponds or natural lakes and ponds less than 10 acres in size are GPA waters; all freshwater wetlands not classified as GPA waters are class AA, A, B or C under §§ 467 and 468 according to the watershed in which they occur. Coastal wetlands are classified SA, SB or SC according to the provisions of § 469 (Classification of Estuarine and Marine Waters). Groundwater is classified GW-A according to provisions of 38 M.R.S. § 470.

Maine law (38 M.R.S. § 464.3.B.) requires that once every three years, the Department review the classification system and related standards and make recommendations to the Board of Environmental Protection for any needed changes in the water quality classifications assigned to specific waterbodies. This process, which is also required

under the Clean Water Act [§303(c)(1); 40 CFR Part 131.20], is known as a Triennial Review (TR). During the period covered by this Report, the following relevant changes to the water quality classification system and related standards have been made:

- In 2018, bacteria criteria were updated in all water quality classes, and DO criteria in Class A (PL 2017, Chapter 319).
- In 2019, the classification of eleven rivers and streams, or groups of rivers and streams, was changed (PL 2019, Chapter 333).
- In 2019, a sustenance designated fishing use, which is a subcategory of the applicable fishing designated use, was created (PL 2019, Chapter 463). The proper application of the sustenance fishing designated use is described in an amendment to the bill (Committee Amendment to L.D. 1775).
- In 2020, various ambient water quality criteria as included in *Surface Water Quality Criteria for Toxic Pollutants*, *06-096 C.M.R. Chapter 584* (effective date February 16, 2020) were revised or expanded.
- Since January of 2020, the Department has been carrying out a TR which will extend into 2022 for any required legislation. More information is available at www.maine.gov/dep/water/wqs/triennial-review.html .

303(D) VISION

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Related Website (EPA): www.epa.gov/tmdl/new-vision-implementing-cwa-section-303d-impaired-waters-program-responsibilities

The CWA § 303(d) Program provides a mechanism to integrate and implement water quality efforts for the restoration and protection of the nation's aquatic resources. This program systematically assesses waters and prioritizes restoration objectives that reduce pollutants through Total Maximum Daily Load (TMDL) assessments, prescriptive permits, and implementing alternative approaches to achieve water quality goals. In 2013, EPA announced a new program framework to identify and prioritize water bodies for restoration and protection, entitled A Long-Term Vision for Assessment, Restoration, and Protection under the Clean Water Act Section 303(d) Program (the Vision). The new Vision will be addressed in stages from 2016 to 2022 and includes the following elements: prioritization, assessment, protection, alternatives, engagement, and integration. The Vision recommends that each State identify priority waters for restoration and/or protection plans by 2016, with the goal of completing those plans by 2022.

In December 2015, Maine DEP published a draft document that presented Maine's approach to achieve the Vision's prioritization goal and a list of waters that are high priority for water quality planning efforts (Table 3- 2). Following a public comment opportunity and further internal review, DEP accepted the document as final in May 2016 (Appendix VII). This list of priority waters may be periodically revised as plans progress and new information emerges. In the relevant tables in Chapter 8 and in Appendices II-V, Vision waters are indicated in italics.

Twenty-one priority waters included in Maine's Vision were addressed in 2016 in the Maine Statewide TMDL for Nonpoint Source Pollution (NPS TMDL, www.maine.gov/dep/water/monitoring/tmdl/tmdl2.html; Table 3-2). The purpose of

these TMDLs for sediment, phosphorus, and nitrogen is to address the impaired aquatic life use associated with NPS pollution. A further fourteen priority waters included in Maine's Vision were addressed in 2021. Thirteen freshwater streams were included in an addendum to the Maine Statewide NPS TMDL. The Great Pond Watershed-Based Management Plan (dated March 2021) was submitted with supplemental information and accepted by EPA as an alternative restoration plan (www.maine.gov/dep/water/grants/Great%20Pond%20WBMP%20March%202021.pdf). In 2022, Maine DEP will address the remaining four priority waters and begin planning for the next ten-year Vision (Vision 2.0), which will extend from 2022-2032.

Table 3- 2. Priority Waters Included in Maine's Vision as of October 2021

Abbreviations used in column Impairment Cause are as follows: A/P, (Algae) Periphyton (Aufwuchs) Indicator Bioassessments; DO, Dissolved Oxygen; Ec, Escherichia coli; H, Habitat Assessment; MI, Benthic Macroinvertebrates Bioassessments; N/E, Nutrient/Eutrophication Biological Indicators; SDT, Secchi Disk Transparency; TP, Total Phosphorus.

Assessment Unit ID	Segment Name	Location	Impairment Cause	Status
ME0106000304_625R01	Adams Brook	Berwick	MI	Complete 9/21
ME0106000103_607R01	Black Brook	Windham	DO	Complete 9/21
ME0103000308_325R02	Brackett Brook	Palmyra	DO	Complete 9/16
ME0102000510_224R01	Burnham Brook	Garland	DO	Complete 9/16
ME0105000305_528R06	Carlton Brook	Whitefield	DO	Complete 9/16
ME0105000305_528R08_01	Chamberlain Brook	Whitefield	DO	Complete 9/16
ME0106000102_603R02	Chandler River	Pownal	DO	Complete 9/16
ME0105000305_528R07	Choate Brook	Windsor	DO	Complete 9/16
ME0106000103_607R03	Colley Wright Brook	Windham	DO	Complete 9/21
ME0101000413_146R02	Coloney Brook	Fort Fairfield	MI and A/P	Complete 9/16
ME0102000510_224R07	Crooked Brook	Corinth	A/P	Complete 9/16
ME0105000305_528R03	Dyer River	Newcastle	DO	Complete 9/16
ME0101000412_143R01	Everett Brook	Fort Fairfield	DO	Complete 9/16
ME0102000510_224R03	French Stream	Exeter	MI and A/P	Complete 9/21
ME0103000310_5274L	Great Pond	Belgrade	TP and SDT	Complete 9/21
ME0106000103_607R06	Hobbs Brook	Cumberland	DO	Complete 9/16
ME0106000103_607R07	Inkhorn Brook	Westbrook	DO	Complete 9/21
ME0103000311_334R03	Jock Stream	Wales	DO and N/E	Complete 9/16
ME0105000305_528R05	Meadow Brook	Whitefield	DO	Complete 9/16
ME0101000412_143R02	Merritt Brook	Presque Isle	MI and A/P	Complete 9/16
ME0103000309_327R01	Mill Stream	Albion	DO	Complete 9/16
ME0106000103_607R08	Mosher Brook	Gorham	DO	Complete 9/21

Assessment Unit ID	Segment Name	Location	Impairment Cause	Status
ME0103000308_325R03	Mulligan Stream	St. Albans	DO	Complete 9/16
ME0104000210_418R02	No Name Brook	Lewiston	DO	Complete 9/21
ME0106000103_607R09	Otter Brook	Windham	DO	Complete 9/21
ME0104000210_413R02	Penley Brook	Auburn	DO	Complete 9/16
ME0106000103_607R12	Pleasant River	Windham	DO	Complete 9/21
ME0104000208_413R03	Stetson Brook	Lewiston	DO	Complete 9/21
ME0106000103_607R10	Thayer Brook	Gray	DO	Complete 9/16
ME0105000305_528R04	Trout Brook	Alna	DO	Complete 9/16
ME0105000218_521R01	Warren Brook	Belfast	DO	Complete 9/16
ME0106000304_625R03	West Brook	North Berwick	DO	Complete 9/16
ME0106000106_602R03	Concord Gully Brook	Freeport	Ec	To be done
ME0102000513_226R03	Penjajawoc Stream/ Meadow Brook	Bangor	MI, DO and H	To be done
ME0102000402_219R01	Piscataquis River	Dover-Foxcroft	DO	To be done
ME0103000305_319R_02	Sandy River	Farmington	MI and DO	In progress

HIGHLIGHTS FOR POINT SOURCE POLLUTION CONTROL PROGRAMS

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Related Website: www.maine.gov/dep/water/wd/index.html

Maine uses multiple approaches to ensure that point source discharges of wastewater receive adequate treatment prior to their release to waters of the State including: licensing, compliance inspections coupled with technical assistance in operations and maintenance, and enforcement where necessary. A number of financial assistance programs support new facility construction, elimination of discharges, and upgrades or additions to existing facilities. Highlights for 2018-2020 for these programs are summarized below or referenced by links to other documents.

Technical Assistance / Pollution Prevention Program

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Related Website: www.maine.gov/dep/water/wwtreatment/

Department staff participate in both industrial- and municipal-based technical assistance and pollution prevention projects.

HIGHLIGHTS FOR 2018-2020

Technical assistance was provided to the operators of over 100 POTWs (Publicly Owned Treatment Works) and industrial direct dischargers by the staff of the Compliance & Technical Assistance Section of the DWQM. Technical assistance focused on improving compliance with Maine Pollutant Discharge Elimination System (MEPDES) permit requirements and maximizing the effectiveness of treatment. In addition to direct assistance at facilities, staff from the Compliance & Technical Assistance Section provided training over 60 formal classroom events for various organizations at locations across the state. Staff from the section continued to oversee the electronic Discharge Monitoring Report (DMR) system, which helps assure that effluent compliance data are reported in an accurate and timely manner to the Department and EPA.

Construction of Wastewater Treatment Facilities

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Related Website: www.maine.gov/dep/water/grants/srfparag.html

CLEAN WATER STATE REVOLVING FUND AND MAINE CONSTRUCTION GRANTS PROGRAMS

Funds from the Clean Water State Revolving Fund (CWSRF) program are used to provide low-interest loans (2% below market rates) to municipalities and districts to upgrade wastewater treatment infrastructure and to fund private nonpoint source (NPS) low interest loan programs for the repair/replacement of residential septic systems, implementation of agricultural best management practices, and the purchase of environmentally friendly silviculture equipment. The program depends on a yearly Federal Capitalization Grant which must be matched with 20% state funds. The Maine Construction Grants Program helps fund wastewater projects in communities that otherwise could not afford to do their project.

Between January 1, 2018 and December 31, 2020, the Construction Grants Program provided grants for 27 wastewater projects and the CWSRF provided loans for 47 wastewater projects, some with assistance from the U. S. Department of Agriculture (USDA) Rural Development program and the U.S. Department of Housing and Urban Development Community Development Block Grant program. These projects included: wastewater treatment facilities upgrades, sewer system improvements, and abatement of combined sewer overflows. In addition, the CWSRF program provided assistance for 56 NPS projects for the removal and/or replacement of underground oil storage tanks, the purchase of silviculture equipment, and green infrastructure. A total of $23,767,433 in State grants and $105,339,861 in CWSRF loans were used to fund the wastewater projects; and $18,138,297 in CWSRF loans was used to fund the NPS projects. $14,674,301 of the CWSRF loan amount was awarded as additional subsidy in the form of loan principal forgiveness.

Maine Combined Sewer Overflow Program

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Related Website: www.maine.gov/dep/water/cso/index.html

Thirty one Maine communities are served by combined sewer systems, which convey a combination of sanitary and storm water flows to wastewater treatment facilities. During dry weather, all of the sewage in a combined system is conveyed to the treatment plant. However, during rainstorms or snow-melt periods, storm water mixes with the sanitary sewage, causing flows that may exceed the capacity of the sewer system. This results in combined sewer overflows (CSOs), which vary extensively in pollutant types, concentrations and loads, as well as in volume of overflow and severity of impact to the receiving water bodies. Maine has established an aggressive program, coordinated with EPA's CSO program, to assist communities in evaluating the design, condition, activity, and effects of combined sewer systems and overflows.

HIGHLIGHTS FOR 2018 - 2020

There were no changes in the number of Maine CSO communities/permittees since the last integrated report. A number of CSO communities are entering the 5 year post construction monitoring phase to determine whether they can safely exit the CSO program. Table 3-3 below lists changes in selected CSO parameters.

Table 3- 3. CSO Program Summary Statistics

Parameter	End of Report Year 2018	End of Report Year 2020	Increase/ (Decrease)
Number of CSO Communities*	31	31	(0) or (0%)
Number of CSO Outfalls**	133	130	(3) or (2.2%)
Number of CSO Discharge Points (Regulators)	166	149	(17) or (10.2%)
Total of Annual Discharge Events for Communities	326	278	(48) or (14.7%)
Total Annual Volume of CSOs (Billion Gallons)	0.5	0.36	(0.14) or (28%)
Weighted Yearly Precipitation (Inches)	46.25	40.88	(5.37) or (11.6%)
Million Gallons Discharged per Inch of Yearly Precipitation (MG/Inch)	10.7	8.8	(1.9) or (17.7%)

* 34 CSO Permits in 31 Communities

** Some outfalls have multiple regulators. CSO regulators are where the wastewater exits the sewer system and enters the CSO outfall line.

Small Community Facilities Program

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Related Website: www.maine.gov/dep/water/grants/scgpara2.html

Since its inception in 1982, the Small Community Grant Program (SCGP) has disbursed 27.5 million dollars in grant monies, and is estimated to have eliminated discharges totaling over 1.5 million gallons of untreated wastewater per day.

While state bond issues usually fund this grant program, in the past it has also received some funding directly from state appropriations. These funds have been used to assist

municipalities with the construction of individual or cluster-type wastewater treatment systems designed to eliminate heavily polluted discharges from either malfunctioning systems or non-existing systems ("straight pipes"). This amount of funding has allowed the construction of new wastewater treatment facilities in over 300 communities throughout the state. The total estimated value of the facilities built with SCGP funds is approximately 31.7 million dollars.

Currently, requests for assistance outweigh available funding. Between 2018 and 2020, the SCGP disbursed grants totaling approximately 1.2 million dollars to 35 communities to replace 67 systems as detailed below.

HIGHLIGHTS FOR 2018-2020

Table 3- 4 provides a summary of information about the program on a year-by-year basis.

Table 3- 4. Yearly Summary of SCGP Activities

Year-by-Year Summary				
Year	**Grant Amount Disbursed**	**Total Facility Value**	**Systems Installed**	**Wastewater Treated (Gal/Day)***
2018	$0	$0	0	0
2019	$731,126	$1,018,902	43	64,902
2020	$510,258	$688,109	24	107,439
Totals:	**1,241,384**	**1,707,011**	**67**	**172,341**

Licensing of Wastewater Discharges

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Related Website: www.maine.gov/dep/water/wd/index.html

The DWQM is responsible for the licensing and re-licensing of all surface wastewater discharges, whether industrial, commercial, municipal, or residential. In Maine, the vast majority of wastewater discharge sources have previously been licensed. Therefore, the licensing program is focused largely upon renewal of existing licenses, rather than development of new licenses (Table 3- 5).

Table 3- 5. Permitting/licensing by the DWQM

Year	**2018**	**2019**	**2020**
Permit Renewals	77 (31 POTWs[1] + 46 non-POTWs)	58 (21 POTWs + 37 non-POTWs)	28 (12 POTWs + 16 non-POTWs)
>2,000 gpd[2] OBD renewals as MEPDES permits	6	5	5
New permits	4	11	6
Minor Revisions/Modifications	13	14	8
<2,000 gpd OBDs	118	276	154
Total permitting actions	**218**	**364**	**259**

[1] Publicly Owned Treatment Works
[2] Gallons per day

Overboard Discharge Grant Program

Contact: Irene Saumur, DEP, BWQ, DWQM

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Related Website: www.maine.gov/dep/water/wd/OBD/index.html

As of December 31, 2020 Maine has 766 licensed overboard discharges (OBDs). OBDs are discharges of wastewater from individual homeowners or businesses to surface waters (typically marine waters) where existing lots are unsuitable for subsurface disposal and no municipal system is available. OBDs contribute to closures of shellfish growing and harvesting areas.

In 1989 an OBD Removal Grant Program was established. The priorities of the grant program are to eliminate discharges that either cause the closure of shell fishing areas or that create a public nuisance. Since the beginning of the program, approximately eleven million dollars have been spent to remove 1,990 systems. The total acreage opened to shellfish harvesting since the start of the OBD Grant Program is over 18,000 acres. According to DMR, opening and fully utilizing this much shellfish harvesting area has the potential to generate an annual harvest with a retail value of over 4.4 million dollars.

HIGHLIGHTS FOR 2018 - 2020

A total of 148 OBD systems were removed in 2018-2020.

Compliance Evaluation

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Related Website: www.maine.gov/dep/water/wd/municipal_industrial/index.html

The Department uses a three-part program to evaluate the compliance of wastewater treatment facilities. The compliance evaluation program involves on-site inspections of wastewater treatment facilities, occasional selective sampling of effluent quality, and monthly evaluation of the licensees' self-monitoring reports. Discharge licenses also require immediate reporting of any major malfunctions, bypasses or exceedances of license limits to DEP inspectors.

HIGHLIGHTS FOR 2018-2020

During this three-year period, inspectors from the Compliance & Technical Assistance Section conducted 1,156 inspections at facilities located throughout the state. These inspections were conducted to verify that the treatment plants were operating in accordance with all requirements of their MEPDES permits. Inspectors evaluate such aspects as laboratory analyses, data quality control, process control, operations and maintenance, collection systems operations and maintenance, and overall plant maintenance. These inspections provide oversight and evaluation of the licensees' compliance with the license, and routinely uncover areas where training, assistance, or equipment upgrades could resolve an issue. DEP compliance inspectors provide assistance as appropriate and can also direct a licensee to other forms of technical assistance available from other DEP staff, other wastewater-related agencies, or private consulting firms. All of these efforts in concert, combined with the efforts of the

treatment plant management and operations staff, serve to preserve and protect the quality of Maine's waterways.

Enforcement of Water Quality Laws

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Related Website: www.maine.gov/dep/enforcement/

The general philosophy of the DEP's BWQ is to gain compliance and resolve problems at the least formal level that is appropriate, and to maximize the spirit of cooperation between DEP and the regulated community. By encouraging voluntary compliance with Maine's water pollution control laws, the overall effectiveness of the enforcement program is maximized and unnecessary litigation is avoided. Formal enforcement actions are fact-dependent, but generally become necessary only when violations of environmental laws are severe enough to warrant action regardless of the remediation effort, or when the violator is not responsive in preventing violations or refuses to cooperate with DEP.

HIGHLIGHTS FOR 2018 - 2020

A total of 8 formal water discharge enforcement cases were settled in 2018 through 2020. The penalties collected act as a deterrent to future violations of water quality laws and neutralize any economic benefit that may have been gained by the violator. The enforcement actions also specified a variety of corrective actions that will improve water quality, such as upgrades to wastewater treatment facilities, elimination of discharges, and Supplemental Environmental Projects.

THE MAINE NPS WATER POLLUTION CONTROL PROGRAM

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Related Website: www.maine.gov/dep/land/watershed/nps/index.html

Maine's Nonpoint Source (NPS) Water Pollution Management Program (38 M.R.S. § 410-I) helps restore and protect water resources from NPS pollution. The basic objective of the NPS program is to promote the use of state agency-defined "best management practice guidelines" (BMPs) to prevent water pollution. DEP uses a combination of statewide programs and targeted watershed projects to make progress towards restoring and protecting water quality.

DEP administers the program in coordination with EPA and other federal, state, and local governmental agencies, and non-governmental organizations. Five Maine agencies share responsibility for implementing NPS programs: DEP, DACF Maine Forest Service (for 2005-2019 'Maine Forestry BMP Use and Effectiveness Reports' please see www.maine.gov/dacf/mfs/policy_management/water_resources/bmps.html), DOT, DHHS Division of Environmental Health, and DMR. State agencies conduct programs that promote voluntary use of BMPs and implement State laws or rules which require that projects meet performance standards to protect water quality. Refer to the Maine NPS Management Program Plan (2020-2024) Chapter VII.

Statewide NPS Control Strategies by NPS Category for information about each agency's NPS-related regulations, programs and management strategies.

HIGHLIGHTS FOR 2013-2020

Three waterbodies were highlighted as EPA's Nonpoint Source Program Success Stories (www.epa.gov/nps/success-stories-about-restoring-water-bodies-impaired-nonpoint-source-pollution).

West Branch Sheepscot River, Windsor – Prized as a Class AA water and home to the endangered native Atlantic salmon, the river began showing significant declines in salmon spawning and signs of degraded stream habitat/water quality in the 1990s. Runoff from eroding roads and stream crossings, agricultural lands, and inadequate stream buffers contributed to the river's bacteria and dissolved oxygen impairments. From 1996-2007, funding from local, state, and federal partners, including seven Section 319 grants, helped restore riparian buffers, stabilize erosion, and install livestock fencing along the river. After monitoring showed that the river supported viable populations of juvenile salmon and attained Maine's Class AA standards for dissolved oxygen, DEP removed the West Branch Sheepscot River from the Section 303(d) list of impaired waters for dissolved oxygen in 2010.

Webster Brook, Limestone – Located in the northeastern-most corner of Maine's Aroostook County, Webster Brook flows through a patchwork of cropland and scattered rural development. Although several neighboring waters experience water quality impacts associated with agricultural runoff, in Webster Brook the impacts from untreated residential wastewater were the long-held concern. In 1996, DEP listed Webster Brook as impaired for high *Escherichia coli* (*E. coli*) bacteria. In 2004, Maine DEP partnered with the town of Limestone and a resident to replace a failing cesspool next to the stream with a new onsite subsurface wastewater treatment and disposal system (septic system). This action reduced bacteria levels in the stream. After DEP monitoring data confirmed that Class B water quality standards for bacteria were met, DEP removed Webster Brook from its section 303(d) impaired waters list in 2010.

Pottle Brook, Perry – Although Perry Brook is still listed as impaired due to high *E. coli* bacteria levels, it was highlighted as a success story because significant progress was made towards meeting water quality standards. In 2010, the Town of Perry and DEP conducted sanitary surveys to identify potential sources of bacteria. The Town then worked with several homeowners to replace or repair malfunctioning septic systems, and a landowner adopted better manure management practices. In 2015, water quality sampling showed significant improvements in the stream's bacteria levels.

More information on NPS watershed projects and DEP's NPS program can be found in the NPS Management Program Annual Reports at: www.maine.gov/dep/water/grants/319-documents/reports/. For more information on Maine NPS programs, refer to the Maine Nonpoint Source Management Program Plan (2020-2024): www.maine.gov/dep/land/watershed/nps-program-plan.html.

STORMWATER PROGRAMS

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Multisector General Permit

Related Website: www.maine.gov/dep/land/stormwater/index.html

Maine's Multi-Sector General Permit regulates the direct discharge of stormwater associated with industrial activity to waters of the State other than groundwater.

DEP issued its latest multi-sector general permit for industrial stormwater discharges in December 2016, with an effective date of March 7, 2017. Maine's industrial stormwater general permit largely mirrors the previous EPA general permit with respect to requirements to develop and implement a Stormwater Pollution Prevention Plan at the site of regulated activities. As of July 1, 2021, 496 facilities have filed NOIs notifying the Department of their Intent to Comply with the multisector general permit and another 600 have filed NECs, certifying that they have No Exposure of pollutants to stormwater.

For more information, including a copy of the Multi-Sector Industrial Stormwater General Permit, see the related web site provided above.

Stormwater Standards for Post-Construction Discharges

Related Website: www.maine.gov/dep/water/wd/long_creek/index.html

Long Creek watershed. On October 28, 2009, EPA issued a final residual designation determination for the Long Creek watershed in the municipalities of South Portland, Portland, Westbrook, and Scarborough. The designation requires that stormwater discharges from impervious areas equal to or greater than one acre in the Long Creek watershed be authorized by a permit under the federal CWA because those discharges contribute to a violation of water quality standards in Long Creek. The Department issued a general permit for stormwater discharges in the Long Creek watershed on November 6, 2009. The permit was reissued in 2015, expired in April 2020, and is Administratively continued until it is reissued. To obtain coverage under the general permit, a discharger must participate in the implementation of the Long Creek Watershed Management Plan (approved by DEP and EPA in 2009). Participation entails signing a contract with the Long Creek Watershed Management District. The contract requires an annual payment to the district based on the amount of impervious area that is contributing a discharge of stormwater to Long Creek. The payments are being utilized to carry out restoration activities described in the watershed management plan. Landowner participation in the general permit exceeds 95%. Several landowners have opted to apply for individual permits and several have not yet obtained permit coverage and are subject to enforcement action, which is on-going. A technical committee has been organized by the district to monitor progress on the implementation of the plan, including monitoring of water quality in Long Creek.

Stormwater Standards for Municipal Separate Storm Sewer Systems (MS4s)

Related Website: www.maine.gov/dep/water/wd/ms4/index.html

DEP reissued its MS4 general permit on October 15, 2020 with an effective date of July 1, 2022 for 30 municipalities; and anticipates that the State and Federal facilities MS4 GP will be reissued on or about October 16, 2021 and covers 8 state and federal facilities; and anticipates that the transportation MS4 GP will be reissued on or about November 20, 2021 for the Maine DOT, and the Maine Turnpike Authority within the Urbanized Area as determined by the combined 2000 and 2010 U.S. Census Bureau (Table 3- 6). The reissuance of the three MS4 GPs has new requirements for Urban Impaired Stream Watersheds.

Table 3- 6 Maine's Regulated MS4s

MS4 Municipalities by Geographic Cluster
Kittery; Eliot; South Berwick; Berwick; York
Biddeford; Saco; Old Orchard Beach; Scarborough; Cape Elizabeth; South Portland; Portland; Westbrook; Gorham; Windham; Falmouth; Cumberland; Yarmouth; Freeport
Auburn; Lewiston; Lisbon Falls; Sabattus
Hampden; Brewer; Bangor; Veazie; Orono; Old Town; Milford
Non-traditional or "Nested" MS4s
Transportation: Maine DOT; Maine Turnpike Authority
State or Federal Entities: Portsmouth Naval Ship Yard (Kittery); Southern Maine Community College (S. Portland); University of Southern Maine (Gorham Campus); Eastern Maine Community College (Bangor); Dorothea Dix Psychiatric Center (Bangor); Bangor Air National Guard (Bangor); University College of Bangor (Bangor); University of Maine (Orono)

LAND USE AND GROWTH MANAGEMENT

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Related Websites: Site Law: www.maine.gov/dep/land/sitelaw/index.html

NRPA: www.maine.gov/dep/land/nrpa/index.html

Shoreland Zoning Act: www.maine.gov/dep/land/slz/index.html

It has long been recognized that land use practices have direct impacts on water quality. The State of Maine has several programs in place to regulate land use activities that have potentially adverse environmental effects. The Site Location of Development Law (Site Law) requires developers of large projects to obtain permits from DEP before beginning construction. Under the Natural Resources Protection Act (NRPA), a permit from DEP is required for any activity in, on, over, or adjacent to a protected natural resource, including rivers, streams, brooks, great ponds, coastal wetlands, freshwater wetlands, significant wildlife habitat, sand dunes and fragile mountain areas. Those provisions of NRPA that affect timber harvesting and related activities are administered and enforced by the Maine Forest Service (MFS). MFS Chapter 21 rules, Statewide Standards for Timber Harvesting and Related Activities in Shoreland areas, as well as

Ch. 27 Rules, Standards for Timber Harvesting and Timber Harvesting Related Activities Within Unorganized and Deorganized Areas of the State, are a result of this delegation from DEP to MFS. The Mandatory Shoreland Zoning Act requires towns to control building sites, land uses, and placement of structures within their shoreland areas in order to protect water quality, habitat and fishing industries, and to conserve shore cover, public access, natural beauty and open space. Also important to environmental protection is the Growth Management Act, which was enacted in 1988. The foundations of this Act are based on comprehensive planning and greater cooperation between state and local governments.

EDUCATION AND OUTREACH

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Related Website: www.maine.gov/dep

DEP understands that engaging and empowering the public in natural resources stewardship through effective education and outreach efforts will only further our own mission of environmental protection. The Department has a responsibility to create and maintain public understanding and support for departmental objectives, programs, regulatory requirements and best practices. To accomplish this, the Department works to help to foster and encourage greater stewardship through education and outreach initiatives strategically directed at a variety of audiences.

Target Audiences

Youth and Teachers- DEP sponsors and organizes Water Festivals for up to 700 students and their teachers in the southern part of the state each year and in northern Maine every other year. The events provide a day of fun and interactive learning about clean water, wetland ecosystems and the importance of stewarding Maine's most rapidly renewable resource and are connected to more comprehensive classroom learning units. Department staff also educate Maine students on environmental issues through other forums as requested and as available, including Envirothon, Bug Mania and Earth Science Day (the latter two with about 2,000 students each); and judging various state science fairs.

The DEP has created a series of environmental education curricula for Maine students in middle and high school to highlight environmental stewardship and career opportunities in the environmental regulatory field in Maine. These curricula can be accessed at: www.maine.gov/dep/schools/lessons/index.html .

General Public- The DEP divides the public into categories based on the message of the campaign: homeowners for yard care practices, businesses for pollution prevention practices, etc. For example, the MS4 communities are conducting pilot projects to encourage targeted Best Management Practices (e.g. yard care, roof runoff infiltration) in targeted neighborhoods with evaluation as part of their permits.

Contractors, Municipal Officials, and Other Targeted Groups- Through the NPS Training Center within the Department's Office of Communications & Education, DEP reaches out to contractors, landscapers, foresters, and code enforcement officers to provide technical assistance, certification, and new training. Maine law requires that

as of January 1, 2013 contractors doing excavation in the Shoreland Zone must be certified in erosion control. There are over 2,600 certified contractors as of December 2020.

DEP staff also train wastewater treatment plant operators, planning boards, realtors, code enforcement personnel and other audiences.

Assessment

Thanks to increased use of press releases, our website, social media, and other existing and emerging communication tools, DEP is reaching more Mainers each year. The effectiveness of the Department's education and outreach efforts continues to improve as better tools are developed to monitor impressions and measure effectiveness.

The Environmental Impact and Economic & Social Costs/Benefits of Effective Water Quality Programs

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Assessment of the many costs and benefits associated with water quality changes is a difficult task. While it is usually possible to determine that an improvement in water quality has occurred and to qualitatively describe those benefits, often there is no easy way to directly quantify this information in terms of the monetary value of benefits to human health or the environment.

The economic tools that would be useful in estimating the costs and benefits of improvement in water quality have not yet been fully developed. As future environmental problems grow in complexity and cost, and as public budgets tighten, demonstrating the benefits of water-quality-related programs will be necessary to maintain support for continued investment in the improvement of water resources. Continued development of sophisticated economic tools for measuring the benefits of environmental projects and methods is essential.

The following sections contain brief summaries of selected water quality programs.

Nonpoint Source Management

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Related Website: www.maine.gov/dep/water/grants/319.html

Table 3- 7 summarizes costs for NPS pollution programs supported by EPA's annual grant to DEP under § 319(h) of the CWA and non-federal matching funds for federal fiscal years (FFY) 2013 to 2020.

Table 3- 7 § 319(h) Clean Water Act Grant Awards to Maine

Grant Year (FFY)	Federal 319 Award	Non-Federal Match	Grant Projects Funded*	Estimated Pollutant Load Reductions		
				Sediment (tons/yr)	Phosphorus (pounds/yr)	Nitrogen (pounds/yr)
2013	$1,726,692	$1,598,163	15	313	263	227

Grant Year (FFY)	Federal 319 Award	Non-Federal Match	Grant Projects Funded*	Estimated Pollutant Load Reductions		
				Sediment (tons/yr)	Phosphorus (pounds/yr)	Nitrogen (pounds/yr)
2014	$1,766,269	$1,268,659	16	427	381	594
2015	$1,748,003	$1,272,347	9	434	435	1,086
2016	$1,863,124	$1,341,442	11	7,256	536	912
2017	$1,897,215	$1,467,494	16	196	193	283
2018	$1,873,000	$1,906,437	11	684	424	896
2019	$1,853,540	$1,235,693	16	399	1,470	568
2020	$1,931,339	$2,144,676	9	530	452	381
Totals	**$14,659,182**	**$12,234,911**	**103**	**10,239**	**4,154**	**4,947**

*Includes grant projects funded with CWA Section 604(b) funds to develop watershed-based plans.

Pollution Prevention Initiatives

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Related Website: www.maine.gov/dep/assistance/index.html

The pollution prevention initiatives developed and promoted by the Office of Innovation and Assistance are based on the practical notion that it is far more protective of the environment and cost effective to eliminate or reduce pollution at its source than to clean up pollution that has already been released into an ecosystem. Office staff work with businesses and DEP technical staff to provide compliance tools for minimizing pollution from sources such as stormwater and wastewater discharges, encourage more sustainable practices for handling waste, and to improve BMPs.

Office staff continue outreach and technical assistance to the regulated community incorporating beneficial reuse, source reduction and sustainability concepts. Staff take a proactive approach to collaborate with sector trade associations, state agencies, municipalities, EPA, and stakeholder organizations to provide technical assistance and training.

Staff methods include developing tools and outreach materials, conducting trainings/meetings, site visits, individual phone calls and emails, and presenting at conferences.

CHAPTER 4 SURFACE WATER MONITORING & ASSESSMENTS

MONITORING PROGRAM

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Related Website: www.maine.gov/dep/water/monitoring/comprehensive-monitoring&assessment-strategy12-11-18.pdf

In 2018, Department staff from the Division of Environmental Assessment (DEA) in the Bureau of Water Quality (BWQ) compiled a 'Comprehensive Surface Water Ambient Water Quality Monitoring and Assessment Strategy, 2015-2025' ('Strategy', linked above). This document provides a framework describing existing monitoring and assessment efforts by staff and other monitoring partners, as well as elements of a monitoring program needed to meet objectives set forth by the Department. The Strategy describes specific monitoring goals and objectives, and the types of monitoring designs and methods used to achieve these goals. For further details, please consult the full document.

LISTING AND ASSESSMENT METHODOLOGY

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Listing Methodology for the 2018/2020/2022 305(b)/303(d) Integrated Report List

Determination of water quality attainment is based on a waterbody meeting applicable standards including the criteria established for its assigned classification (38 M.R.S. §§ 465, 465-A, 465-B). Waters are listed in Appendices II-VI by AU ID in one of five categories of attainment (see category descriptions below). For the 2018/2020/2022 report, water quality attainment decisions were primarily based on monitoring data collected in in calendar years 2013 through 2020 for rivers/streams; 2013 through 2021 for estuarine/marine waters, 2015 through 2020 for wetlands, 2015 through 2018 for lakes/ponds, and 2016 through 2020 for coastal designated beaches; more recent data was consulted where appropriate; see Chapter 1 for background.

All freshwaters in Maine are subject to a statewide fish consumption advisory due to "impairment caused by atmospheric deposition of mercury". On December 20, 2007, EPA approved a Regional Mercury TMDL that moved all Maine freshwaters into Category 4-A ("TMDL is completed"). Other category listings are established independently from the statewide mercury advisory listing, thus all waters are listed in Category 4-A for mercury and in at least one other category. All marine waters are listed by narrative in Category 5-D "Legacy Pollutants" as well as in one other category[4]. Each listing in Appendices II-VI provides the AU ID (Rivers and Streams, Wetlands,

[4] All estuarine and marine waters in Maine have an advisory for the consumption of shellfish (lobster tomalley) due to the presence of PCBs and dioxins presumed to be from atmospheric deposition or historical sources. The advisory is based on probability data that shellfish (lobster tomalley) inhabiting estuarine or marine waters may exceed the advisory action level for these substances. The Integrated Report does not consider this statewide advisory in establishing other category listing.

Estuarine and Marine Waters, and coastal designated beaches) or HUC plus MIDAS number (Lakes), Name, Location (Rivers and Streams, Wetlands, Estuarine and Marine Waters only), Size, Classification (excluding Lakes, which are all Class GPA), and depending on assessment determination, information on impairment, notes on previous listings, or other information. Note that the USGS has replaced the HUC system with the Watershed Boundary Dataset (WBD) system. Because of this conversion, a mismatch now exists between some HUCs used in the IR and current WBDs (former HUCs). DEP did not update the HUC part of any AU ID to conform to the new WBD system and is retaining the term 'HUC' to indicate continued usage of the older system.

LISTING CATEGORIES (1-5)

Category 1: Attaining all designated uses and water quality standards, and no use is threatened.

Highest level of attainment - waters in the AU attain all applicable standards. Assessment is based on combined evaluation of the following information.

1. Current data (collected within five years) indicates attainment, with no trend toward expected non-attainment within the listing period.

2. Old data (greater than five years) indicates attainment and no change in any associated conditions.

3. Water quality models predict attainment under current loading, with no projected change in loading that would predict non-attainment.

4. Qualitative data or information from professional sources indicating attainment of standards and showing no identifiable sources (e.g. detectable points of entry of either licensed or unlicensed wastes) of pollution, low impact land use (e.g. intact riparian buffers, >90% forested watershed, little impervious surface), watershed within state or federal reserve land, park, wilderness area or similar conservation protection, essentially unaltered habitat, and absence of other potential stressors.

5. Determination that the direct drainage area has a human population of <0.1 (0 for lakes) per square mile according to U.S. Census data obtained in 2010 and watershed conditions as described in item 4, above. For lakes, determinations are based on census data at the town level and proportionally considers all towns in the direct drainage of larger lakes. Populations for the remaining lakes (generally less than ten acres) are determined for the town listed as the point-of-record for the water according to the DIF&W Lake Index database.

Category 2: Attains some of the designated uses; no use is threatened; and insufficient data or no data and information is available to determine if the remaining uses are attained or threatened (with presumption that all uses are attained).

Assessment is based on combined evaluation of the following information.

1. Current data (collected within five years) for some standards indicating attainment, with no trend toward expected non-attainment within the listing period, or an inadequate density of data to evaluate a trend.

2. Old data (greater than five years) for some standards indicating attainment, and no change in associated conditions.

3. Water quality models that predict attainment for some standards under current loading, with no projected change in loading that would predict non-attainment.

4. Probabilistic-based monitoring for lakes indicates a high expectation of use attainment for certain classes of waters based on random monitoring of that class of waters.

5. Insufficient data for some standards, but qualitative data/information from professional sources indicate a low likelihood of impairment from any potential sources (e.g. high dilution, intermittent/seasonal effects, low intensity land use).

Category 3: Insufficient data and information to determine if designated uses are attained (with presumption that one or more uses may be impaired).

Assessment is based on combined evaluation of the following information.

1. Insufficient or conflicting data that does not confirm either attainment or non-attainment of designated uses.

2. Qualitative data or information from professional sources showing the potential presence of stressors that may cause impairment of one or more uses; however, no quantitative water quality information confirms the presence of impairment-causing stressors.

Category 4: Impaired or threatened for one or more designated uses, but does not require development of a TMDL.

A waterbody is listed in Category 4 when impairment is caused by a pollutant but a TMDL has already been completed or other enforceable controls are in place, or when impairment is not caused by a pollutant. An impaired waterbody listed in Category 4 will also be listed in Category 5 if both a pollutant and a non-pollutant are involved that would independently cause an impaired or threatened condition. Waters are listed in one of the following Category 4 sub-lists when:

1. Current or old data for a standard indicates either impaired use or a trend toward expected non-attainment within the listing period, but where enforceable management changes are expected to correct the condition;

2. Water quality models that predicted impaired use for some standard under current loading also predict attainment when required controls are in place; or,

3. Quantitative or qualitative data/information from professional sources indicates that an impaired use is not caused by a pollutant(s) (e.g. habitat modification).

4-A: TMDL is completed. A TMDL is complete but insufficient new data exists to determine that attainment has been achieved.

Note: As of the 2008 cycle, Category 4-A includes all freshwaters in Maine that were listed in previous cycles in a narrative Category 5-C “Impairment caused by atmospheric deposition of mercury” based on the Statewide fish consumption advisory due to mercury. On December 20, 2007, EPA approved a Regional Mercury TMDL for the Northeast.

4-B: Other pollution control requirements are reasonably expected to result in attainment of standards in the near future. Waterbodies where enforceable controls have a reasonable expectation of attaining standards, but where no new data are available to determine whether attainment has been achieved. (Enforceable controls may include new wastewater discharge licenses issued without preparation of a TMDL, contracts for nonpoint source implementation

projects, regulatory orders or contracts for hazardous waste remediation projects, and other regulatory orders).

4-C: Impairment not caused by a pollutant. Waters impaired by habitat modification (e.g. a dam, physical covering of habitat) that is a result of human activity. Decisions regarding fish passage impairments caused by dams are made on a case-by-case basis in consultation with staff at the Maine Department of Marine Resources (DMR) or Inland Fisheries & Wildlife (DIF&W).

Note 1: Natural conditions that do not attain water quality standards and criteria are allowed by 38 M.R.S. § 464(4)(C). Waters that show impairment due to natural phenomena are listed in Categories 1 through 3.

Note 2: In preparation for the 2022 Integrated Report, DEP staff collaborated with staff from DMR to develop a detailed listing methodology for fish passage impairments. This effort proved to be too complex and difficult to complete in time for inclusion in this report. Therefore, the Department opted to not create any listings in this cycle, and is deferring future listings to the 2024 cycle, for which the Department plans to develop a new methodology in collaboration with Maine fisheries agencies.

Category 5: Waters impaired or threatened for one or more designated uses by a pollutant(s) and a TMDL is required.

Waters are listed in one of the Category 5 sub-lists when:

1. Current data (collected within five years) for a standard indicates either impaired use or a trend toward expected impairment within the listing period, and quantitative or qualitative data/information from professional sources indicates that the cause of impaired use is from a pollutant(s);

2. Water quality models predict impaired use for a standard under current loading, and quantitative or qualitative data/information from professional sources indicates that the cause of impaired use is from a pollutant(s); or,

3. Waters that were previously listed on the State's 303(d) list of impaired waters, based on current or old data that indicated the involvement of a pollutant(s), and where there has been no change in management or conditions that would indicate attainment of use.

5-A: Impairment caused by pollutants (other than those listed in 5-B through 5-D). A Total Maximum Daily Load is required and will be conducted by the State of Maine. TMDL schedules or priorities are assigned based on the specifics of a particular water (considering size, public use, proximity to population centers, and level of public interest for water quality improvement), the nature of the impairment and the source(s) of the problem, available information to complete the TMDL, and availability of staff and contractual resources to acquire information and complete the TMDL study. Projected schedules or priorities for TMDL completion are included in Chapter 8 (Tables 8-14 to 8-18) and in the Appendices.

5-B: Impairment caused solely by bacteria contamination. A TMDL is required. Certain waters impaired only by bacteria contamination may be high priority resources, such as shellfish areas or coastal designated beaches, but a low priority for TMDL development if other actions are already in progress that will correct the problem in advance of TMDL development (e.g. better compliance). A projected schedule of TMDL completion is included where applicable. Waterbodies impaired only by CSOs, where current CSO Master Plans (Long-Term Control Plan) are in

place, will be monitored to demonstrate that water quality standards are attained and that provisions are in place for both funding and compliance timetables.

5-C: Impairment caused by atmospheric deposition of mercury. A regional TMDL is required. Due to EPA approval of a regional TMDL for the control of mercury, all of Maine's Category 5-C waters were administratively moved to Category 4-A in the 2008 cycle.

5-D: Impairment caused by a "legacy" pollutant. This sub-category includes:

1. Waters impaired only by PCBs, dioxins, DDT, or other substances already banned from production or use, including waters impaired by contaminated sediments where there is no additional extrinsic load occurring. This is a low priority for TMDL development since there is no controllable load.

2. Coastal waters that have a consumption advisory for the tomalley (hepatopancreas organ) of lobsters due to the presence of persistent bioaccumulating toxins found in that organ. This is a low priority for TMDL development since there is no identifiable and controllable load.

5-Alt: Impairment caused by pollutants. This newly created sub-category (2018/2020/2022 cycle; 5-Alt is short for 5-Alternative) includes waters that are impaired or threatened for one or more designated uses by a pollutant(s) and an Alternative Restoration Plan has been completed. Category 5-Alt was created as part of EPA's new program framework to identify and prioritize water bodies for restoration and protection, entitled A Long-Term Vision for Assessment, Restoration, and Protection under the Clean Water Act Section 303(d) Program (the Vision). 5-Alt waters remain on the 303(d) list until water quality standards are attained or a TMDL is completed.

DELISTING FROM AN IMPAIRED TO AN UNIMPAIRED CATEGORY.

Because there are a number of listing options available in the integrated list, some waterbodies may be removed from the previous "impaired waters" list, i.e. 303(d) list, under certain circumstances. The State must provide new information, to EPA's satisfaction, as a basis for not listing specific waters that had been previously included on a 303(d) list. Acceptable reasons for not listing previously listed waters as provided in 40 C.F.R. 130.7(b) may include situations where:

- The assessment and interpretation of more recent, more accurate or paleolimnological data demonstrates that the applicable water quality standard(s) is being met (list in Category 1, 2).
- The results of more refined water quality modeling, or updated data analysis methods, demonstrate that the applicable water quality standard(s) is being met (list in Category 1 or 2).
- It can be demonstrated that errors or insufficiencies in the original data and information led to the water being incorrectly listed (list in Category 1, 2 or 3).
- It can be documented that there are changes in the criteria that originally caused the water to be impaired and therefore originally led to the listing; for example, new criteria were adopted (list in Category 1 or 2).
- The State has demonstrated pursuant to 40 C.F.R. 130.7(b)(1)(ii) that there are effluent limitations required by State or local authority which are more stringent than technology-based effluent limitations, required by the CWA, and that these more

stringent effluent limitations will result in the attainment of water quality standards for the pollutant causing the impairment within a reasonable time (list in Category 4-B).

- The State has demonstrated pursuant to 40 C.F.R. 130.7(b)(1)(iii) that there are other pollution control requirements required by State, local, or federal authority that will result in attainment of water quality standards for a specific pollutant(s) within a reasonable time (list in Category 4-B).
- The State included on a previous § 303(d) list some Water Quality Limited Segments beyond those that are required by EPA regulations, e.g. waters where there is no pollutant associated with the impairment (list in Category 4-C).
- A TMDL has been approved or established by EPA since the last 303(d) list (list in Category 4-A).
- Special provision for the 2018/2020/2022 Report: As explained in section Data Interpretation, Bacteria, Shellfish propagation and harvest (pages 61-63), Growing Area Sections that for the current cycle were assessed as closed administratively as of March 1st, 2021 due to lack of assessment or insufficient data (as determined by the Department of Marine Resources), and therefore no impairment had been documented, are located in Category 3 per EPA guidance (Grubbs and Wayland 2000, US EPA 2002) and item 2 in the long-standing 'Listing Category' description for Category 3 (page 37). In Maine's 2016 Integrated Report, these administratively closed Growing Area Sections were included in Category 5-B-1 since, regardless of amount of data available, shellfish harvest was not permitted at the time of assessment. Per EPA guidance and Maine's Listing Category description, the 2016 placement in Category 5-B-1 was done in error. DEP delisted these waters to Category 3 in the 2018/2020/2022 cycle to correct the prior erroneous listing.

Chapter 8 Tables 8-6 to 8-9 show waters that have been delisted from Maine's 2016 303(d) list. For waters that were delisted for reasons other than TMDL approval, delisting information is presented in Chapter 8 in the section New Delistings.

Assessment Criteria

Table 4- 1 through Table 4- 3 provide the designated use categories and the criteria (with references) used to assess a water's attainment of the use. Uses and criteria in effect as of 1/1/2021 were applied to assessments based on monitoring data collected in calendar years 2013 (or 2015) through 2020. Due to the 1-3 year timeframe criteria updates typically require in Maine, and the current status of update efforts, no changes in water quality standards are anticipated by the submittal date of this report (4/1/2022).

Criteria listed in Table 4- 1 through Table 4- 3 consist predominantly of those that are included in Maine statutes. However, for certain uses, federally promulgated criteria exist as noted in the tables. The federal criteria are the result of the 2015 disapproval of a number of Maine water quality standards (WQS) and subsequent promulgation (in 2016, effective date of 1/18/2017) of WQS for Maine by the U.S. Environmental Protection Agency (EPA); more information is available on this web page: www.epa.gov/wqs-tech/water-quality-standards-regulations-maine. Federal criteria for Maine are included in 40 C.F.R. § 131.43. Some of these criteria are applicable statewide, but most are only applicable to waters in Indian lands (i.e. waters in the reservations and trust lands of the four Indian tribes in Maine).

A determination of non-attainment is only made when there is documented, quality assured evidence (e.g. monitoring data) indicating that one or more criteria are not attained (see Data Interpretation, below, for details). Such data are also weighed against evidence that there are plausible natural factors that may cause or contribute to the non-attainment of criteria [38 M.R.S. § 464(4)(C)]. Per 40 C.F.R. § 131.43, the natural conditions provision in § 464(4)(C) does not apply to water quality criteria intended to protect human health, i.e. bacteria; this restriction is only applicable to waters in Indian lands. Details regarding attainment determinations are provided below in section 'Data Interpretation'.

A special case is made for wetlands assessments with respect to documented evidence of impairment. For Category 3-5 wetlands that are located in a river/stream or lake/pond (e.g. a wetland that occurs in a slow-flowing section of a stream), any impairments, for example to the fish consumption use, that are listed for the related river/stream or lake/pond AU are also assigned to the wetland AU even if no wetland-specific data for such an impairment exist. For Category 3-5 wetlands that are not located in a river/stream or lake/pond, DEP biologists will decide on a case-by-case basis whether impairments listed for adjacent waters should apply to associated wetlands.

Table 4- 1 Maine Designated Uses and Attainment Criteria for Rivers and Streams[1]

Designated Use	Criteria for Attainment
Drinking water supply after disinfection / treatment	• Ambient Water Quality Criteria for toxics (DEP Rule Chapters 530 and 584) • General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A) and 40 C.F.R. § 131.43(c)]; floating/settleable solids [38 M.R.S. § 464(4)(B)] • Maine CDC's Maximum Exposure Guidelines (MEGs)
Aquatic life use support[2]	• Biomonitoring - lotic benthic macroinvertebrates: numeric biocriteria (DEP Rule Chapter 579) • Biomonitoring - lotic algae: narrative aquatic life use criteria (38 M.R.S. § 465) and expert judgment evaluation of structure and function of the resident biological community • Biomonitoring (wetland habitats) - wetland macroinvertebrates and epiphytic algae: narrative aquatic life use criteria (38 M.R.S. § 465) and expert judgment evaluation of structure and function of the resident biological community • Habitat suitability [38 M.R.S. §§ 464(13), 465(1-4)] • Dissolved oxygen [38 M.R.S. § § 464(13), 465(1-4)] • Ambient Water Quality Criteria for toxics (DEP Rule Chapters 530 and 584) • Support of indigenous species • Wetted habitat (DEP Rule Chapter 581) • General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A) and 40 C.F.R. § 131.43(c)]; floating/settleable solids [38 M.R.S. § 464(4)(B)]
Fishing/Fish Consumption	• Support of indigenous fish species • Absence of fish consumption advisory (instituted by Maine CDC) • Sustenance fishing provisions (38 M.R.S. §§ 466.10-A, 466-A, 467, 468, and 420) • General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A) and 40 C.F.R. § 131.43(c)]; floating/settleable solids [38 M.R.S. § 464(4)(B)]
Recreation in and on the water[2] (Primary and Secondary Contact Recreation)	• *E. coli* bacteria [38 M.R.S. § 465 and 40 C.F.R. § 131.43(a); geometric mean, Statistical Threshold Value] • Water color (38 M.R.S. § 414-C)

Designated Use	Criteria for Attainment
	• General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A) and 40 C.F.R. § 131.43(c)]; floating/settleable solids [38 M.R.S. § 464(4)(B)]
Navigation, hydropower, agriculture/industrial supply	• General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A) and 40 C.F.R. § 131.43(c)]; floating/settleable solids [38 M.R.S. § 464(4)(B)]

[1] Including fringing wetlands.

[2] DEP is developing draft nutrient criteria for fresh surface waters (Draft Chapter 583) that relate to existing designated uses for aquatic life and recreation. For more information, see www.maine.gov/dep/water/nutrient-criteria/.

Table 4- 2 Maine Designated Uses and Attainment Criteria for Lakes and Ponds[1]

Designated Use	Criteria for Attainment
Drinking water supply after disinfection / treatment	• Ambient Water Quality Criteria for toxics (DEP Rule Chapters 530 and 584) • General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A) and 40 C.F.R. § 131.43(c)]; floating/settleable solids [38 M.R.S. § 464(4)(B)]
Aquatic life use support	• Trophic State Trend (38 M.R.S. § 465-A, DEP Chapter 581) • Ambient Water Quality Criteria for toxics (DEP Chapters 530 and 584) • Aquatic life [38 M.R.S. §§ 465-A, 464(9)] • Biomonitoring (wetland habitats) - wetland macroinvertebrates: narrative aquatic life use criteria (38 M.R.S. § 465-A) and expert judgment evaluation of structure and function of the resident biological community • General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A) and 40 C.F.R. § 131.43(c)]; floating/settleable solids [38 M.R.S. § 464(4)(B)] • Hydropower GPA impoundments [38 M.R.S. § 464(9)]
Fishing/Fish Consumption	• Support of indigenous fish species • No fish consumption advisory (instituted by Maine CDC) • Sustenance fishing provisions (38 M.R.S. §§ 465-A.D, 466.10-A, 466-A, and 420) • General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A) and 40 C.F.R. § 131.43(c)]; floating/settleable solids [38 M.R.S. § 464(4)(B)]
Recreation in and on the water (Primary and Secondary Contact Recreation)	• *E. coli* bacteria (38 M.R.S. § 465-A, geometric mean, Statistical Threshold Value; EPA 2012 Recreational Water Quality Criteria, Beach Action Value) • Nusiance Algal Bloom Definition (38 M.R.S. § 465-A, DEP Rule Chapter 581) • General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A) and 40 C.F.R. § 131.43(c)]; floating/settleable solids [38 M.R.S. § 464(4)(B)]
Navigation, hydropower, agriculture / industrial supply	• General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A) and 40 C.F.R. § 131.43(c)]; floating/settleable solids [38 M.R.S. § 464(4)(B)]

[1] Including fringing wetlands.

Table 4- 3 Maine Designated Uses and Attainment Criteria for Estuarine and Marine Waters

Designated Use	Criteria for Attainment
Marine life use support, including shellfish propagation [1]	• Ambient Water Quality Criteria for toxics (DEP Chapters 530 and 584) • Dissolved oxygen (38 M.R.S. § 465-B) • Narrative biological standards (38 M.R.S. § 465-B) • General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A)]; floating/settleable solids [38 M.R.S. § 464(4)(B)]
Shellfish harvest [1]	• National Shellfish Sanitation Program (as assessed by DMR) [38 M.R.S. § 465-B and 40 C.F.R. § 131.43(a)] • No shellfish consumption advisory (instituted by Maine CDC) • General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A)]; floating/settleable solids [38 M.R.S. § 464(4)(B)]
Aquaculture	• General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A)]; floating/settleable solids [38 M.R.S. § 464(4)(B)]
Fishing/Fish Consumption	• Support of indigenous fish species • No fish consumption advisory (instituted by Maine CDC) • Sustenance fishing provisions (38 M.R.S. §§ 466.10-A, 466-A, 469, and 420) • General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A)]; floating/settleable solids [38 M.R.S. § 464(4)(B)]
Recreation in and on the water (Primary and Secondary Contact Recreation)	• *Enterococcus* bacteria (38 M.R.S. § 465-B and 40 C.F.R. § 131.43(a), geometric mean, Statistical Threshold Value; Maine Healthy Beaches Program Beach Action Value) • General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A)]; floating/settleable solids [38 M.R.S. § 464(4)(B)]
Navigation, hydropower, industrial supply	• General provisions: color, taste, turbidity, radioactive substances [38 M.R.S. § 464(4)(A)]; pH [38 M.R.S. § 464(4)(A)]; floating/settleable solids [38 M.R.S. § 464(4)(B)]

[1] Applies to estuarine/marine waters with high enough salinity to naturally support shellfish propagation and harvest

Data Interpretation

GENERAL PRINCIPLES

Maine DEP uses a wide variety of data to arrive at water quality standards (WQS) attainment decisions. Data are collected by DEP staff or DEP-trained volunteers, and are obtained from outside parties as indicated in Chapter 1. Assessments are based on evaluation of quality-assured physical, chemical or biological datasets that have been collected to assess specific uses or water quality criteria. In addition to specific guidelines described below, for each dataset factors such as data quality and quantity, age, time of data collection and sampling method, are considered. Furthermore, in-stream characteristics (including aquatic macrophyte information), duration, frequency and magnitude of criteria excursion, habitat, site characteristics (e.g. land use, water velocity, canopy cover), predominant weather patterns and site-specific environmental factors are also considered. To arrive at an assessment determination, DEP staff consider all variables to interpret the data and evaluate results against relevant narrative or numeric criteria. A final assessment determination may be guided by

professional judgment by expert staff (biologist, environmental specialist, or engineer) which may override assessments based on rote comparisons of datapoints to criterion values.

When data for only one variable, such as dissolved oxygen (DO) or pH, are available for a waterbody, the data are compared to existing criteria and an assessment determination is made with due consideration of the factors listed above.

Some uses are assessed via several different criteria and types of data. For example, for aquatic life use (ALU) attainment determinations, DEP staff conducts monitoring of biological communities (macroinvertebrates, algae, eelgrass, fish) and ALU indicators such as dissolved oxygen (DO), temperature, pH, chlorophyll a (Chl a), transparency, and habitat suitability, as well as toxics and nutrients, including 'nutrient/eutrophication biological indicators'. When results from different indicators are available and conflict, Maine DEP may use a 'weight of evidence' approach informed by best professional judgment or create a Category 3 (insufficient data or information) listing. For ALU attainment determinations, recent monitoring results from biological communities obtained using DEP methods may be given greater weight than other data because biological communities integrate the cumulative effects of both natural and anthropogenic stressors and can thus provide more comprehensive information on known and unknown stressors. Conversely, discrete chemical and physical data, especially if few in number, provide short-term information that may or may not be representative of predominant conditions in a waterbody. However, if chemical or physical data clearly indicate an impairment (i.e. a criteria violation) when biological data suggest criteria attainment, a waterbody will be listed as impaired per independent application of criteria.

Generally, data from unique events such as a short-duration license violation, or a drought or flood are not used in assessment determinations. Spills or accidents are evaluated for their effects on waterbodies on a case-by-case basis and may lead to impairment listings. A single excursion of a criterion does not usually lead to an impairment listing unless there is corroborating evidence of reasonable potential for impairment of a use.

Regarding the time of data collection, monitoring activities for integrated reporting purposes focus on index periods provided in Maine Statute or periods that are either equivalent to 'worst case scenarios' (e.g. critical conditions during summer low flow/high temperature/long photoperiod periods in rivers and stream) or dictated by practical considerations (e.g. optimal water levels in wetlands that may dry down later in the season). Information on these periods is provided below.

The following principles for each criteria type are used in making WQS attainment assessments in concert with the general principles outlined above.

BIOLOGICAL CRITERIA

River, stream, and wetland benthic macroinvertebrate and algal samples are collected in accordance with the Biological Monitoring Program Quality Assurance Project Plan. Methods stipulate assessment periods of July 1 to September 30 for stream macroinvertebrates, June 15 to July 31 for stream algae, and June and July for wetland macroinvertebrates and algae.

Stream macroinvertebrate assessments are based on a statistical model that predicts attainment of tiered aquatic life uses (Classes AA/A, Class B, and Class C). The stream macroinvertebrate model is described in Maine *Classification Attainment Evaluation*

Using Biological Criteria for Rivers and Streams, 06-096 C.M.R. ch. 579 (effective date May 27, 2003). For streams and rivers, aquatic life criteria are attained when a probability equal to or greater than 0.60 is achieved. Final determination of attainment may in some cases be made by professional judgment, applied in accordance with the procedures described in *06-096 C.M.R. ch.* 579 and elsewhere in Department statutes and rules.

The Biological Monitoring Program completed an algal bioassessment model that is predominantly applicable to wadeable streams and rivers with rocky substrates. In the absence of rocky substrate, algal samples may also be collected from submerged logs or other course woody debris. The Program also completed algal and macroinvertebrate bioassessment models for freshwater emergent and aquatic bed wetlands, including wetlands associated with rivers, streams, lakes and ponds. These stream and wetland algal models and wetland macroinvertebrate model have not yet been added to Chapter 579. For the current Integrated Report, Department biologists used expert judgment informed by the models to assess attainment of narrative aquatic life criteria (38 M.R.S. § 465). *06-096 C.M.R. ch. 579* will be amended to include the stream algal model, wetland algal model, and wetland macroinvertebrate model, following a standard public review process. In general, two non-attainment samples are required for a waterbody to be listed in Category 5. This allows the Program to verify results that may be due to unusual circumstances, such as atypical habitat, particularly wet or dry years, or where samplers may have been disturbed, in addition to normal interannual variability. However, if a sample indicates clear impairment (e.g. extremely low or high abundance of organisms) and other evidence also point towards impairment (e.g. high in-stream nutrient concentrations, clear riparian disturbance, known contaminants, etc.) a Category 5 listing may be based on a single sample.

Ambient water quality criteria, whole effluent toxicity (WET) testing, and other biological sampling are also used to determine if other components of the biological community, such as fish, meet the aquatic life uses.

LAKE TROPHIC STATE

Assessment is based on measures of transparency, chlorophyll a, total phosphorus and color (Table 4- 4). When lakes lack this information, a trophic determination made by DIF&W is used, if available. Their determination is more subjective and generally applies to the lake system as a whole including adjacent wetlands and fisheries productivity. Trophic determination is tracked by source in DEP files.

Table 4- 4 Lake Trophic State Parameters and Guidelines

Numerical Guidelines for Evaluation of Trophic Status in Maine			
(Note: Dystrophy is not often evaluated as a trophic category separately from categories below.)			
	Trophic Status		
Parameter[1]	**Oligotrophic**	**Mesotrophic[2]**	**Eutrophic**
Secchi Disk Transparency	> 8 meters	4-8 meters	< 4 meters
Chlorophyll a	< 1.5 ppb	1.5 – 7 ppb	> 7 ppb
Total Phosphorus[3]	< 4.5 ppb	4.5 – 20 ppb	>20 ppb
TSI[3, 4]	0-25	25-60	>60 and/or repeated algal blooms

[1] Based on long-term means.
[2] No chronic nuisance algal blooms.
[3] If color is >30 Standard Platinum Units or not known, chorophyll-a concentration, dissolved oxygen, and best professional judgment are used to assign trophic category.
[4] TSI = Trophic State Indices are calculated when adequate data exists and when color is at or below 30 SPU for Secchi Disk Transparency and Total Phosphorus.

SUPPORT OF INDIGENOUS SPECIES

Assessment based on the known absence of a species previously documented as indigenous to a waterbody in historical records collected by state or federal agencies or through published scientific literature; or based on non-attainment of water quality criteria, absence of critical habitat necessary to support indigenous species, or presence of conditions known to prevent support of indigenous species.

DISSOLVED OXYGEN

Dissolved oxygen (DO) criteria are provided in Table 4- 5.

Table 4- 5 Dissolved Oxygen Criteria for Fresh, Estuarine and Marine Waters

Statutory references are: Class AA, A, B and C – 38 M.R.S. § 465; Class GPA - 38 M.R.S. § 465-A; Class SA, SB and SC – 38 M.R.S. § 465-B.

Class	Criteria*	Class	Criteria
AA	As naturally occurs	GPA	--
A	7 ppm or 75% saturation From 10/1 to 5/14, 7-day mean concentration not less than 9.5 ppm and 1-day minimum concentration not less than 8.0 ppm in identified fish spawning areas	SA	As naturally occurs
B	7 ppm or 75% saturation From 10/1 to 5/14, 7-day mean concentration not less than 9.5 ppm and 1-day minimum concentration not less than 8.0 ppm in identified fish spawning areas	SB	Not less than 85% of saturation
C	5 ppm or 60% saturation but must maintain WQ sufficient for spawning in identified fish spawning areas 6.5 ppm (monthly average) at 22° and 24°C	SC	Not less than 70% of saturation

* 'ppm' is the same as 'mg/L'

DO levels are assessed in rivers and streams, lakes and ponds, and estuarine and marine waters. Instantaneous measurements are collected in all waterbody types, while continuous data are collected in rivers and streams, and estuarine and marine waters only. Details of the different assessment guidelines used are provided below. These guidelines were newly developed in 2020 and 2021 and were based on a literature and partial data review, and best professional judgment by expert staff; future refinements are possible. Assessment decisions also consider evidence that there are plausible natural factors that may cause or contribute to low DO levels in certain waterbodies. Per 38 M.R.S. § 464(4)(C), those waterbodies shall not be considered to be failing to attain their classification because of those natural conditions, and will not be assessed as impaired.

In lakes and ponds, where no DO criteria exist, DO data is only used as supporting data for WQS attainment decisions; more information is provided below.

Assessment Guidelines for DO Measurements in Rivers and Streams, and Estuarine and Marine Waters

Note: the following guidelines are used for Integrated Report assessments only and thus do not apply in the context of DO attainment decisions for discharge licensing purposes.

In rivers and streams, DO assessments occur predominantly between June 15 and September 15 with a focus on summer periods with critical conditions of low flow, high temperature and long photoperiod. Assessments during the period of 10/1 to 5/14 (applicable only to certain fish spawning areas, see criteria table above) are limited in extent because the cold water temperatures during that time are expected to ensure criteria attainment. In estuarine and marine waters, assessments occur predominantly between May 1 and October 31 with a primary focus on summer periods with critical conditions of minimal tide range, higher water temperature and long photoperiod.

Maine DEP uses two different approaches to analyze DO levels based on quality-assured data: a) continuous data from a continuous monitoring device such as a sonde; and b) repeated, discrete measurements collected either at the time of anticipated low DO concentrations, or for the determination of diurnal swings at the times of anticipated low and high concentrations[5].

Continuous data

The use of continuous datasets is preferred over discrete measurements as continuous datasets allow a comprehensive analysis of WQS attainment across a range of conditions; this is particularly true in estuarine systems which experience a very dynamic range of conditions. Maine DEP staff collect continuous data according to DEP's 'Continuous Monitoring Water Quality Standard Operating Procedures' (SOP), which includes extensive Quality Assurance/Quality Control (QA/QC) measures. Only data that have been graded Excellent or Good are used in assessments. Longer-term (≥10 days) deployments that focus on critical conditions are preferred over short-term (<10 days) deployments to obtain a more comprehensive picture of conditions. Short-term datasets, unless they encompass a sufficient period of critical conditions, are generally only used as supporting information.

Continuous datasets are typically fairly large and provide critical insights regarding the underlying drivers of water quality gradients. In addition to using graphs and basic statistics (e.g. daily minima or maxima), Maine DEP staff screen these datasets for further analysis using the guidelines described below. If a dataset is found to exceed any one of the guidelines, staff will investigate the severity of exceedance and surrounding factors to determine whether a clear impairment exists (Category 5), or whether insufficient information is available and additional data need to be collected (Category 3). Other data, in particular those from biological communities, and the factors listed in the first paragraph in General Principles may aid in making a WQS attainment determination. A final listing determination is based on best professional judgment by expert staff.

Screening guidelines allow for the evaluation of both chronic and acute conditions. For rivers and streams, only data in mg/L are screened and this approach is expected to be adequate to allow detection of possible non-attainment of WQS expressed in % saturation. Estuarine and marine DO criteria are expressed in % saturation, due to the inherent influence that salinity has on DO saturation capacity; therefore screening guidelines focus on % saturation data (except for the analysis of diurnal fluctuations). Note that only measurements that exceed a DO criterion by an amount roughly equal to or greater than the instrument/measurement error as defined in the applicable QAPP or SOP are considered exceedances. Screening guidelines are as follows:

[5] Contact DEP staff for advice on these times. Data collected at times that typically do not provide low or high DO concentrations will be evaluated for usability on a case-by-case basis.

Rivers and streams:

- An exceedance event occurs when criteria are exceeded in ≥3 consecutive measurements.
- A duration exceedance occurs when applicable criteria are exceeded in ≥3 consecutive measurements in ≥2 hours.
- A frequency exceedance occurs
  - When >10% of measurements in the summer period of a deployment record exceed applicable criteria (e.g. for 2,000 data points and 0.3 mg/L instrument/measurement error, >200 points are <6.7 mg/L in a Class B river with a DO criterion of 7 mg/L);
  - Or when a criteria exceedance event (as defined above) occurs on ≥4 consecutive days;
  - Or when a criteria exceedance event occurs for >2 consecutive days ≥2 times in any rolling 10-day period.
- A magnitude exceedance occurs
  - When DO is <6.7 (Class A or B) or <4.7 mg/L (Class C) in >5% of measurements in the summer period of a deployment record;
  - Or when a criteria exceedance event (as defined above) of >0.7 mg/L (i.e. <6.3 and <4.3 mg/L in Class A/B and C, respectively) occurs in a 24-hour period for >2 days in any rolling 10-day period.
- A diurnal swing exceedance occurs when a maximum swing per day of ≥2 mg/L occurs
  - On >10% of days of the summer period of a deployment record (e.g. for a 60-day deployment, >6 days have swings of ≥2 mg/L).
  - Or on ≥4 consecutive days;
  - Or on >2 consecutive days ≥2 times in any rolling 10-day period.

Estuarine and marine waters:

- An exceedance event occurs when criteria are exceeded in ≥3 consecutive measurements.
- A duration exceedance occurs when applicable criteria are exceeded in consecutive measurements for ≥2 hours.
- A frequency exceedance occurs
  - When >10% of measurements in the summer period of a deployment record exceed applicable criteria (e.g. for 2,000 data points and 5% instrument/measurement error, >200 points are <80% in a Class SB estuary or marine waterbody with a DO criterion of 85%);
  - Or when a criteria exceedance event (as defined above) occurs on ≥4 consecutive days;
  - Or when a criteria exceedance event occurs for >2 consecutive days ≥2 times in any rolling 10-day period.
- A magnitude exceedance occurs
  - When DO is <80% (Class SB) or <65% SC) in >5% of measurements in the summer period of a deployment record;
  - Or when a criteria exceedance event (as defined above) of >10% (i.e. <75% and <60% in Class SB and SC, respectively) occurs in a 24-hour period for >2 days in any rolling 10-day period.
- A diurnal swing exceedance occurs when a maximum swing per day of ≥2.5 mg/L occurs

- On >10% of days of the summer period of a deployment record (e.g. for a 60-day deployment, >6 days have swings of ≥2.5 mg/L).
- Or on ≥4 consecutive days;
- Or on >2 consecutive days ≥2 times in any rolling 10-day period.

Discrete measurements

Generally, assessments should be based on ≥4 discrete, quality-assured measurements per year collected during the periods indicated above under 'Assessment Guidelines for DO Measurements in Rivers and Streams, and Estuarine and Marine Waters'. For marine waters, where DO measurements are taken by vertical profile, '≥4 discrete measurements' consist of ≥4 profiles and the minimum % saturation measured in a profile is assessed against these guidelines. Only measurements that exceed the relevant DO criterion by an amount equal to or greater than the instrument/measurement error as defined in the applicable QAPP or SOP are considered exceedances. In addition, if there is evidence of plausible natural factors causing or contributing to low DO levels, this will not constitute non-attainment of a DO criterion [per 38 M.R.S. § 464(4)(C)] and will not lead to an impairment decision.

A single exceedance (as defined above) of the criterion per year does not usually trigger an impairment decision unless there is corroborating evidence of reasonable potential for impairment of a use. Factors to be taken into account when considering corroborating evidence are listed above (first paragraph in General Principles) as well as natural factors as explained above. Generally, if the relevant DO criterion is exceeded in 2 samples per year in 2 of the most recent 5 assessment years, a Category 3 listing is created. Generally, if the relevant DO criterion is exceeded in ≥2 samples in >2 of the most recent 5 assessment years, a Category 5 listing is created. A final listing determination is based on best professional judgement by expert staff, taking into account factors as explained above.

DO (and pH) Measurements in Lakes and Ponds

In these waterbodies, assessments occur during the growing season about a month after ice-out to about a month before ice-on. In all but a few Maine lakes, DO is measured periodically when other lake data are being collected using a DO meter to collect profile data from the top to bottom of the lake at the deep spot. pH is generally determined in the lab on epilimnetic samples obtained during the August baseline period; occasionally a pH profile is obtained when a multimeter or sonde equipped with a pH probe is available.

In lakes, DO concentrations exhibit more of an annual pattern. Hypolimnetic DO concentrations are of particular interest when lakes are most stressed during late summer. Eutrophic waters can develop anoxia that can lead to internal recycling of phosphorus in iron-dominated sediments, which can further fuel algal growth. One complication in the assessment of lake DO data is that the hypolimnetic water in some lakes will develop DO depletion naturally due to the shape of lake bottom. Lakes having a basin morphometry that is more funnel-shaped versus bowl shaped are expected to naturally develop depletion in the late summer because detritus is focused into the deeper regions, creating more biological oxygen demand. The department has developed a model to determine which lakes tend to naturally develop depletion but are not yet able to confidently apply the model for assessment purposes. Present attainment decisions are based on other assessment data with DO data used as supporting information. Often when deteriorating trophic trends are observed in lakes of adequate depth to develop a hypolimnion, examination of historic profiles reveals

that the onset of depletion has occurred earlier in the year over time, persists for a longer duration, and may be of greater magnitude. It is interesting to see the daily fluctuations related to whole pond/lake metabolism when continuous DO data is collected from every meter, but the expense and amount of maintenance required for such devices in Maine limits their use to private or research institutions.

Like DO data, pH data is also used as supporting information when making attainment decisions based on other assessment data.

AMBIENT WATER QUALITY CRITERIA FOR TOXICS

Assessment is based on measured exceedance of Statewide Water Quality Criteria as established by Chapter 584: *Surface Water Quality Criteria for Toxic Pollutants* (effective July 29, 2012) (or Site-specific criteria where they may exist), or reasonable potential to exceed the criteria following EPA's Principle of Independent Applicability and Technical Support Document for Water Quality-Based Toxics Control (https://www3.epa.gov/npdes/pubs/owm0264.pdf). Single excursions of the criterion or excursions within the range of sampling or instrument error (as established in a QAPP) may not be used in every case unless there is corroborating evidence of reasonable potential for impairment of a use. Factors to be taken into account when considering corroborating evidence include, but are not limited to: in-stream characteristics; land use; extent of excursion; analysis method; hardness; pH, temperature or dissolved organic carbon. Assessment may also be based on the use of water quality models (e.g. dilution models) based on present or expected loadings.

NUTRIENT/EUTROPHICATION BIOLOGICAL INDICATORS

Narrative listing criteria for this cause of Aquatic Life Use (ALU) impairment consist of documentation of abnormal biological findings that indicate nutrient enrichment in rivers and streams as well as marine waters. Excess nutrients impair ALU through alteration of habitat, creation of diurnal DO sags caused by excessive plant and algae growth, abundant epiphytic growth resulting in decreased light availability to submerged vegetation, and alteration of benthic macroinvertebrate assemblage structure.

BACTERIA

There are two different sets of bacteria criteria in place in Maine, depending on water quality class and location of a waterbody, see Table 4- 6. In that table, where EPA bacteria criteria are shown, they are applicable to waters in Indian lands (i.e. waters on reservation and trust lands) while Maine criteria are applicable to all other waters in Maine. Where only Maine criteria exist, they are applicable statewide.

Table 4- 6 Bacteria Criteria for Fresh, Estuarine and Marine Waters

Statutory references are: Class AA, A, B and C – 38 M.R.S. § 465; Class GPA - 38 M.R.S. § 465-A; Class SA, SB and SC – 38 M.R.S. § 465-B. EPA criteria - 40 C.F.R. § 131.43. STV - Statistical Threshold Value.

Class	ME Bacteria Numeric Criteria	EPA Bacteria Numeric Criteria
Class AA	As naturally occurs but *E. coli* may not exceed geometric mean of 64 CFU/100 ml over 90-day interval or 236 CFU/100 ml in more than 10% of samples (STV) in any 90-day interval.	None

Class	ME Bacteria Numeric Criteria	EPA Bacteria Numeric Criteria
Class A	As naturally occurs but *E. coli* may not exceed geometric mean of 64 CFU/100 ml over 90-day interval or 236 CFU/100 ml in more than 10% of samples (STV) in any 90-day interval.	None
Class B	*E. coli* may not exceed geometric mean of 64 CFU/100 ml over 90-day interval or 236 CFU/100 ml in more than 10% of samples (STV) in any 90-day interval from 4/15 to 10/31.	*E. coli* may not exceed a geometric mean of 100 CFU/100 ml in any 30-day interval or 320 CFU/100 ml in more than 10% of the time (STV) in any 30-day interval.
Class C	*E. coli* may not exceed geometric mean of 100/CFU/100 ml over 90-day interval or 236 CFU/100 ml in more than 10% of samples (STV) in any 90-day interval from 4/15 to 10/31.	*E. coli* may not exceed a geometric mean of 100 CFU/100 ml in any 30-day interval or 320 CFU/100 ml in more than 10% of the time (STV) in any 30-day interval.
Class GPA	*E. coli* may not exceed geometric mean of 29 CFU/100 ml over 90-day interval or 194 CFU/100 ml in more than 10% of samples (STV) in any 90-day interval.	None
Class SA	As naturally occurs but *Enterococcus* may not exceed geometric mean of 8 CFU/100 ml in any 90-day interval or 54 CFU/100 ml in more than 10% of samples (STV) in any 90-day interval.	*Enterococcus* – none For shellfish harvesting, not to exceed the numbers of total coliform bacteria or other specified indicator organisms recommended under the National Shellfish Sanitation Program, United States Food and Drug Administration, as set forth in the Guide for the Control of Molluscan Shellfish, 2015 Revision.
Class SB	*Enterococcus* may not exceed geometric mean of 8 CFU/100 ml in any 90-day interval or 54 CFU/100 ml in more than 10% of samples (STV) in any 90-day interval from 4/15 to 10/31. Not to exceed criteria of National Shellfish Sanitation Program for shellfish harvesting.	*Enterococcus* may not exceed geometric mean of 30 CFU/100 ml in any 30-day interval, or 110 CFU/100 ml in more than 10% of the time (STV) in any 30-day interval.
Class SC	*Enterococcus* may not exceed geometric mean of 14 CFU/100 ml in any 90-day interval or 94 CFU/100 ml in more than 10% of samples (STV) in any 90-day interval from 4/15 to 10/31. Not to exceed criteria of National Shellfish Sanitation Program for restricted shellfish harvesting.	*Enterococcus* may not exceed geometric mean of 30 CFU/100 ml in any 30-day interval, or 110 CFU/100 ml in more than 10% of the time (STV) in any 30-day interval.

In addition to the bacteria criteria listed above, Maine also uses the EPA-approved Beach Action Value (BAV) for *Enterococcus* bacteria as implemented by the Maine

Healthy Beaches program (MHB; for more information on the program see pages 127-131) for assessments of certain marine and estuarine waters, and the recommended *E. coli* BAV from EPA's 2012 Recreational Water Quality Criteria (RWQC) (www.epa.gov/sites/production/files/2015-10/documents/rwqc2012.pdf) for assessments of fresh waters. Details are provided below.

Assessment of bacteria criteria attainment occurs for two designated uses: recreation in the water (i.e. Primary Contact Recreation), and shellfish propagation and harvest, as described below. This assessment methodology was newly developed in 2021 and was based on data reviews and best professional judgment by expert staff; future refinements are possible.

Recreation in and on the Water

This use (i.e. Primary and Secondary Contact Recreation) is applicable to all waters. The assessment of bacteria criteria attainment depends on whether a section of a waterbody is a designated beach or not. A 'designated beach' is defined as an area where a local entity has voluntarily established or participates in a quality-assured monitoring program for indicator bacteria (enterococci or *E. coli*) to determine whether the water quality is safe for swimming or and other recreation. On coastal, marine beaches, the MHB program coordinates monitoring with local entities, therefore beaches that participate in the MHB Program are designated beaches. To date, no such monitoring program exists for freshwater beaches on lakes or rivers, and consequently, except for isolated instances on rivers, DEP has virtually no data that would allow for the assessment of criteria attainment. Assessment details are provided below.

Designated beaches - coastal

The MHB Program is the primary source of water quality data for *Enterococcus* bacteria at designated coastal, marine beaches in the State of Maine. For background on the Program, see 'Coastal, Marine Beach Recreational Water Quality Monitoring', page 106 and 'Maine Healthy Beaches Program', pages 127-131. MHB uses an EPA-approved safety threshold or Beach Action Value (BAV) of 104 Most Probable Number (MPN[6]) of *Enterococcus* bacteria per 100 mL to assess beach recreational water quality. Exceedance of the BAV triggers a recommended beach water quality notification, or 'contamination advisory'. Because participation in the MHB program is voluntary, MHB can only recommend that program partners post contamination advisories, but has no legal authority to force action. Contamination advisories are recommended for individual Beach Management Areas (BMAs, as defined under the MHB program) that may have one or more monitoring sites. If a BMA has more than one site, a BAV exceedance at any one site will trigger a notification recommendation for the entire BMA. Integrated Report assessments are based on the percentage of a monitoring season (generally Memorial Day to Labor Day) that a BMA is under notification. The percentage is calculated as follows:

- A notification day is any day during the monitoring season when a sample result at a BMA is ≥104 MPN/100ml (BAV) and any subsequent days until results from a sample (either resample or another routine sample) are below the BAV.

[6] MPN is equivalent to CFU.

- The total number of days a BMA is under notification is divided by the length of the monitoring season and multiplied by 100 to determine the % of season days under contamination notification.

Assessment categories are assigned as follows:

- If a BMA is under notification for >10% of monitoring season days for 1 or 2 years (except if it is the last two consecutive years of the IR reporting period), it will be listed as Category 3.
- If a BMA is under notification for >10% of monitoring season days for ≥3 years (or the last two consecutive years), it will be listed as Category 5.

Final listing decisions regarding placement in either Category 3 or 5 are made by DEP MHB staff using best professional judgement based on consideration of: the seasonal geomean; the magnitude of the individual exceedances; weather patterns and frequency and volume of precipitation; number of sites monitored per beach; monitoring frequency; and knowledge of beach specific occurrences. BMAs that do not require inclusion in Categories 3 or 5 based on the assessment guidelines provided above are listed in Category 2. No BMAs are included in Categories 1 or 4.

Designated beaches - freshwater

Because Maine has no quality-assured monitoring program for indicator bacteria (*E. coli*) on designated freshwater beaches to determine whether the water quality is safe for swimming or and other recreation, virtually no data are available that would allow for the assessment of criteria attainment. Presently the responsibility for assessing bacteria and enacting swimming closures, falls to municipalities and private beach owners. Where freshwater data are available, assessments are based on EPA's 2012 recommended freshwater BAV of 190 CFU of *E. coli* bacteria per 100 mL. The assessment methodology for designated freshwater beaches is the same as described under 'Designated beaches – coastal', above, except that a different BAV is used and each beach has its own monitoring season. Due to a lack of a coordinated monitoring program, designated freshwater BMAs are not clearly defined but rather established by the monitoring authority. Final listing decisions are made using best professional judgement by DEP expert staff.

Non-beach waters

For fresh or marine waters that are not designated beaches, the applicable geometric mean or Statistical Threshold Value (STV) criteria from Maine's or EPA's water quality standards (see table at start of this subsection) are used for attainment decisions, taking into consideration year-round or seasonal criteria applicability as appropriate. Geomeans and STVs are calculated on a rolling basis over 90 (Maine standards) or 30 (EPA standards) days, and generally a minimum of 5 (Maine standards) or 3 (EPA standards) samples per interval is required for attainment decisions. A single exceedance of a criterion per year does not usually trigger an impairment decision unless there is corroborating evidence of reasonable potential for impairment of a use. Factors to be taken into account when considering corroborating evidence are listed above (first paragraph in General Principles), augmented by any local knowledge of unusual wildlife concentrations. Generally, 2 exceedances of a geomean or STV per year in 2 of the most recent 5 assessment years leads to a Category 3 listing. Generally, two or more exceedances of a geomean or STV in >2 of the most recent 5 assessment years leads to a Category 5 listing. Final listing determinations are based

on best professional judgement by expert staff, taking into account factors as explained above.

Shellfish propagation and harvest

Note: assessments for the statutory designated use of 'propagation and (restricted) harvesting of shellfish[7]' are done separately for propagation versus harvesting. The following text describes assessments for shellfish harvesting, which presumes subsequent consumption. Assessments of the propagation use are currently limited to determining whether pH criteria (which are assumed to be protective of shellfish propagation) are met. Guidelines for pH assessments are provided below under 'General Provisions, Including pH', 'Assessment Guidelines for pH Measurements in Rivers and Streams, and Estuarine and Marine Waters'.

Shellfish harvest is a designated use for all marine and estuarine waterbody classes. Classes SA and SB state that "waters must be of such quality that they are suitable for…harvesting of shellfish", while Class SC waters must be "suitable for…restricted harvesting of shellfish". Shellfish harvest 'classification' is determined by the Maine Department of Marine Resources (DMR) based on guidance provided by the National Shellfish Sanitation Program (NSSP), Table 4- 7. As detailed on pages 215-218 of the 'Guide for the Control of Molluscan Shellfish' (U.S. Food and Drug Administration 2019, www.fda.gov/media/143238/download), methods used for classifying shellfish harvest areas may include either total coliform or fecal coliform standards. The DMR uses fecal coliforms to most accurately assign classifications based on quantities of bacteria originating from the digestive tracts of warm-blooded animals that are potentially pathogenic and therefore reflect a human health risk. The DMR has divided the coast of Maine into 45 Growing Areas, and each Growing Area is subdivided into multiple Growing Area Sections. For example, Growing Area WG [East Point (Biddeford) to Prouts Neck (Scarborough)] is comprised of two Prohibited Growing Area Sections, P1 and P2, and four Conditionally Approved Growing Area Sections, CA1-CA4. Growing Area Section assignments are based on results of a sanitary survey and/or water quality monitoring data. A sanitary survey consists of 1) a shoreline survey to identify pollution sources, 2) marine water sampling to test for fecal coliform counts, and 3) an analysis of how environmental conditions (weather, tides, currents) could affect pollutant distribution. As frequently as annually, the DMR reviews and may change classification assignments based on water quality statistics, removal of Overboard Discharges (OBDs), or new information regarding spatial influence of wastewater treatment plants. Changes in classification assignments may, but do not necessarily, result in spatial changes in Growing Area Sections.

Table 4- 7 Maine DMR NSSP classifications

This table has been lightly modified from www.maine.gov/dmr/shellfish-sanitation-management/programs/growingareas/howclassified.html. This webpage also provides details regarding classification methods and implications.

Classification	Status	Shellfish Harvesting Activity
Approved	Open	Harvesting allowed
Conditionally Approved	Open	Harvesting allowed except during specified conditions (rainfall, STP* bypass or seasonal)
	Closed	Harvesting NOT allowed

[7] Classes SA and SB have the designated use of 'propagation and harvesting of shellfish', Class SC has 'propagation and restricted harvesting of shellfish'.

Classification	Status	Shellfish Harvesting Activity
Restricted	Open	Depuration and/or Relay harvesting only
Conditionally Restricted	Open	Depuration and/or Relay harvesting allowed except during specified conditions (rainfall, STP* bypass or seasonal)
	Closed	Harvesting NOT allowed
Prohibited	Closed	Harvesting NOT allowed, NO water use allowed for processing (administratively imposed precautionary closure, or closed based on data)

* STP, Sewage Treatment Plant

The DMR administratively assigns a Prohibited status to Growing Area Sections that are unassessed (i.e. when a recent sanitary survey and/or monitoring data is/are not available), or when a Growing Area Section is unassessed but assumed to be influenced by wastewater discharges, marinas, agricultural operations, or other sources of persistent pollution. As of the drafting of this document (August 2021), administrative closures account for all but three Prohibited Growing Area Sections, and Conditional Approval has been applied administratively to 14 Growing Area Sections.

For the 2018/2020/2022 reporting cycle, Integrated Report assessments for shellfish harvest closures in Class SA, SB and SC waters are based on classifications as of March 1, 2021. This endpoint corresponds to the date on which the Maine DMR transitioned to using the Growing Area and Growing Area Section scheme for describing spatial extent of harvest classifications. Subsequent to 2022, Integrated Report assessments for shellfish harvest will be based on classifications as of the end of the assessment period relevant to a specific reporting cycle.

Assignments of Growing Area Sections to 305(b)/303(d) categories are described here and in Table 4- 8. Any area with the classification of "Approved"[8] attains the designated use of Shellfish Harvest and is placed in Category 2. Growing Area Sections that are closed administratively due to lack of assessment or insufficient data, and therefore no impairment has been documented, are located in Category 3 per EPA guidance (Grubbs and Wayland 2000, US EPA 2002) and item 2 in the long-standing 'Listing Category' description for Category 3 (page 37). All other classifications (Conditionally Approved, Restricted, Conditionally Restricted and Prohibited) that are derived from sufficient data limit shellfish harvest, and those corresponding Growing Area Sections are assigned to Category 5-B-1 for estuarine and marine waters impaired by bacteria. Once the Maine Statewide Bacteria TMDL is revised to include Category 5-B-1(a) assessment units, these units would be moved to Category 4-A.

Table 4- 8 Maine DMR NSSP Growing Area Section classifications and corresponding 305(b)/303(d) category

NSSP Classification	305(b)/303(d) Category
Approved	2
Conditionally Approved (not assessed)*	3
Prohibited (not assessed or insufficient data)*	3
Conditionally Approved	5-B-1 (4-A when TMDL revised)
Restricted	5-B-1 (4-A when TMDL revised)

[8] "Approved" areas are not termed "Growing Area Sections".

NSSP Classification	305(b)/303(d) Category
Conditionally Restricted	5-B-1 (4-A when TMDL revised)
Prohibited (assessed with sufficient data)	5-B-1 (4-A when TMDL revised)

* Conditionally Approved or Prohibited areas assigned administratively are not considered impaired for shellfish harvest

A Growing Area Section that was assigned to Category 5-B-1 in one reporting cycle and to either Category 2 or 3 in the subsequent cycle, or cycles, will be considered for delisting on a case-by-case basis, using the guidelines described in section 'Delisting from an Impaired to an Unimpaired Category' on pages 46-47.

As explained in the paragraph preceding Table 8- 4, Growing Area Sections that are closed administratively due to lack of assessment or insufficient data are located in Category 3 per EPA guidance and item 2 in the 'Listing Category' description for Category 3. As recently as Maine's 2016 Integrated Report, these administratively closed Growing Area Sections were included within Category 5-B-1 since, regardless of amount of data available, shellfish harvest was not permitted at the time of assessment. This approach was not consistent with EPA guidance or the existing Listing Category description and was thus in error. The last bullet in section 'Delisting from an Impaired to an Unimpaired Category' (page 40) provides information regarding delisting 2016 Category 5-B-1 waters closed administratively as of 3/1/2021 to Category 3 in the current Report. More information is also provided in Chapter 8 under 'New Delistings'.

In addition to assessments of the shellfish harvest designated use based on current information obtained from the DMR, 14 historic assessment units affected by combined sewer overflow (CSO) events will be carried forward unchanged in Category 4-A. These AUs were included in the 2009 Statewide Bacteria TMDL and as a result delisted from Category 5-B-1 to Category 4-A in the 2010 cycle. The DMR does not typically monitor areas around CSOs and thus no current data are available for a new assessment. If all CSO outfalls are removed in a municipality, the respective AU will be eliminated, as was done with one AU in the 2012 cycle.

WATER COLOR

Assessment based on repeated measurements of discharge performance data and compliance with 38 M.R.S. § 414-C for pulp and paper discharges only. In lakes and ponds, color due to natural humic organics, often products of vegetative decomposition in neighboring wetlands, may mitigate high phosphorus concentrations and potential algal blooms.

GENERAL PROVISIONS, INCLUDING PH

Use impairment from color, taste, turbidity (38 M.R.S. § 464.4.A.) and floating or settleable solids (38 M.R.S. § 464.4.B.) is subjectively determined. Radioactivity in surface water (38 M.R.S. § 464.4.A.) is not presently monitored.

Two different sets of pH criteria are in place in Maine: per 38 M.R.S. § 464.4.A, criteria are 6.0 to 8.5 for freshwaters, and 7.0 to 8.5 for estuarine and marine waters. Per 40 C.F.R. § 131.43(a), pH criteria are 6.5 to 8.5 for freshwaters in Indian lands, making Maine's freshwater criteria only applicable to waters outside of Indian lands; Maine's criteria for estuarine and marine waters are applicable statewide. pH criteria in Maine

are only applicable to waters with discharges. The guidelines below are used for Integrated Report assessments only and thus do not apply in the context of pH attainment decisions for discharge licensing purposes.

pH levels are assessed in rivers and streams, lakes and ponds, and marine and estuarine waters. Instantaneous measurements are collected in all waterbody types, while continuous data are collected in rivers and streams, and estuarine and marine waters only. Details of the different assessment guidelines used are provided below. These guidelines were newly developed in 2020 and 2021 and were based on a literature and partial data review, and best professional judgment by expert staff; future refinements are possible. In lakes and ponds, continuous pH data are not typically collected and an explanation is provided above under 'Dissolved Oxygen, DO Measurements in Lakes and Ponds'.

Assessment Guidelines for pH Measurements in Rivers and Streams, and Estuarine and Marine Waters

In rivers and streams, pH assessments occur predominantly between June 15 and September 15 with a focus on summer periods with critical conditions of low flow, high temperature and long photoperiod. Assessments may also be based on data collected during periods of potentially low pH driven by significant rain events, typically in spring and fall. In estuarine and marine waters, assessments occur predominantly between May 1 and October 31 with a primary focus on summer periods with critical conditions of minimal tide range, higher water temperature, and long photoperiod.

Maine DEP uses two different approaches to analyze pH levels: a) continuous data from a continuous monitoring device such as a sonde; or b) repeated, discrete measurements collected at the time of anticipated low or high pH concentrations[9].

Continuous data

The use of continuous datasets is preferred over discrete measurements as continuous datasets allow a comprehensive analysis of WQS attainment across a range of conditions; this is particularly true in estuarine systems which experience a very dynamic range of conditions. Maine DEP staff collect continuous data according to DEP's 'Continuous Monitoring Water Quality SOP' which includes extensive QA/QC procedures. Only data that have been graded Excellent or Good are used in assessments. Longer-term (≥10 days) deployments are preferred over short-term (<10 days) deployments to obtain a more comprehensive picture of conditions. Short-term datasets, unless they encompass a sufficient period of critical conditions, are generally only used as supporting information.

Continuous datasets are typically fairly large but provide critical insights regarding the underlying drivers of water quality gradients. In addition to using graphs and basic statistics (e.g. daily minima or maxima), Maine DEP staff screen these datasets for further analysis using the guidelines described below. If a dataset is found to exceed any one of the guidelines, staff will investigate the severity of exceedance and surrounding factors to determine whether a clear impairment exists (Category 5), or whether insufficient information is available and additional data need to be collected (Category 3). Other data, in particular those from biological communities, and the factors listed in the first paragraph in General Principles may aide in making a WQS

[9] Contact DEP staff for advice on these times. Data collected at times that typically do not provide low or high pH concentrations will be evaluated for usability on a case-by-case basis.

attainment determination. A final listing determination is based on best professional judgment by expert staff.

Screening guidelines allow for the evaluation of both chronic and acute conditions. Note that only measurements that exceed a pH criterion by an amount roughly equal to or greater than the instrument/measurement error as defined in the applicable QAPP or SOP are considered exceedances. Screening guidelines are as follows:

Rivers and streams as well as estuarine and marine waters:

- An exceedance event occurs when criteria are exceeded in ≥3 consecutive measurements.
- A duration exceedance occurs when applicable criteria are exceeded in consecutive measurements for ≥2 hours.
- A frequency exceedance occurs
  - When >10% of measurements in the summer period of a deployment record exceed applicable criteria (e.g. for 2,000 data points and 0.2 instrument/measurement error, >200 points are <5.8 or >8.7 for a freshwater criterion of 6.0-8.5, or <6.8 or >8.7 for a estuarine or marine criterion of 7.0-8.5).
  - Or when a criteria exceedance event (as defined above) occurs for ≥4 consecutive days;
  - Or when a criteria exceedance event occurs for >2 consecutive days ≥2 times in any rolling 10-day period.
- A magnitude exceedance occurs
  - When pH is <5.7[10] or >8.8[11] in freshwaters or <6.7 or >8.8 in estuarine or marine waters in >5% of measurements in the summer period of a deployment record;
  - Or when a criteria exceedance event (as defined above) with pH <5.5 or >9.0[2] in freshwaters or <6.5 or >9.0 in estuarine or marine waters occurs in a 24-hour period for >2 days in any rolling 10-day period.

Discrete measurements

Generally, assessments should be based on ≥4 discrete, quality-assured measurements per year collected during the periods indicated above under 'Assessment Guidelines for pH Measurements in Rivers and Streams, and Estuarine and Marine Waters'. For marine waters, where pH measurements are taken by vertical profile, '≥4 discrete measurements' consist of ≥4 profiles and the minimum pH value measured in a profile is assessed against these guidelines. Only measurements that exceed the relevant pH criterion by an amount roughly equal to or greater than the instrument/measurement error as defined in the applicable QAPP or SOP are considered exceedances. It is important to note that certain naturally occurring waterbody types (e.g. bogs, aquifer lakes, high elevation lakes) may have naturally low

[10] Values of <5.7 are indicated in the literature as being detrimental to salmon health (Kroglund, F., Wright, R. F., and Burchart, C. 2002. Acidification and Atlantic salmon: critical limits for Norwegian rivers. Norwegian Institute for Water Research, Report nr 111, 61 pp.).

[11] Federal pH criteria for freshwaters are 6.5 to 9.0. However, as current Maine criteria have an upper limit of 8.5, magnitude exceedance values of >8.8 and >9.0 were deemed appropriate for the determination of exceedances. If Maine increases its upper limit to match the federal criterion of 9.0, the magnitude exceedance values will be updated.

pH due to the presence of naturally occurring organic acids or shallow soils over granitic bedrock that limits buffering capacity.

A single exceedance (as defined above) of the criterion per year does not usually trigger an impairment decision unless there is corroborating evidence of reasonable potential for impairment of a use. Factors to be taken into account when considering corroborating evidence include those listed above (first paragraph in General Principles) as well as bedrock geology. Generally, if the relevant pH criterion is exceeded in 2 samples per year in 2 of the most recent 5 assessment years, a Category 3 listing is created. Generally, if the relevant pH criterion is exceeded in ≥2 samples in >2 of the most recent 5 assessment years, a Category 5 listing is created. A final listing determination is based on best professional judgement by expert staff, taking into account factors as explained above.

pH Measurements in Lakes and Ponds

Please see 'DO (and pH) Measurements in Lakes and Ponds' under 'Dissolved Oxygen', above.

INTEGRATED REPORT LISTS OF CATEGORIES 1 THROUGH 5

Table 4- 9 presents Table 4- 9 a summary of state waters (rivers/streams, lakes/ponds, wetlands, and estuarine and marine waters, including coastal designated beaches) which are attaining or not attaining standards. Table 4- 10 through Table 4- 23 Table 4- 23 present three different types of information for those same types of state waters; the three types are: 1) Individual designated use support summary (Table 4- 9 through Table 4- 13); 2) Total sizes of Category 4 and 5 impaired waters by listing cause/stressor type (Table 4- 14Table 4- 13 through Table 4- 18; 3) Total sizes of Category 4 and 5 impaired waters by source category (Table 4- 19 through Table 4- 23).

Table 4- 9 Summary of State Waters Attaining and Not Attaining Standards

Waterbody Type	Total Assessed for Attaining of WQ Standards – Assessed for Designated Uses	Total Attaining All WQ Standards - Supporting All Designated Uses (Category 1)	Total Attaining At Least One Standard – Supporting at Least One Use but Not All Standards Assessed (Category 2)	Total with Insufficient Data for Assessment – Not Assessed for Any Designated Uses (Category 3)	Total Not Attaining One or More WQ Standards – Not Supporting One or More Uses but Not Needing a TMDL (Category 4)	Total Not Attaining One or More WQ Standards – Not Supporting One or More Uses and TMDL is Needed (Category 5)
River & Stream Miles[1]	35,218	5,277	28,171	350	483[2]	938
Number of Lakes/Ponds	5,780[3]	2,856	2,893[3]	0	28	3
Lake/Pond Acres	986,952[3]	295,418	605,812[3]	0	75,940	9,782
Freshwater Wetland Stations[4]	145	1	102	22	11	9
Freshwater Wetland Acres[5]	14,195	15	6,345	6,933	388	513
Estuarine & Marine Square Miles (Shellfish Harvest Designated Use)	2,884 [6]	0	2,490	356	0	37
Estuarine & Marine	2,889 [7]	0	2,876	0	5	8 [8]

Waterbody Type	Total Assessed for Attaining of WQ Standards – Assessed for Designated Uses	Total Attaining All WQ Standards - Supporting All Designated Uses (Category 1)	Total Attaining At Least One Standard – Supporting at Least One Use but Not All Standards Assessed (Category 2)	Total with Insufficient Data for Assessment – Not Assessed for Any Designated Uses (Category 3)	Total Not Attaining One or More WQ Standards – Not Supporting One or More Uses but Not Needing a TMDL (Category 4)	Total Not Attaining One or More WQ Standards – Not Supporting One or More Uses and TMDL is Needed (Category 5)
Square Miles (All Other Designated Uses)						
Estuarine/Marine Miles - Coastal Designated Beaches	39.02	0	36.99	1.21	0	0.82
Tidal Wetland Acres	Not assessed					

[1] River and Stream mile summaries for each reporting category were generated by ATTAINS.
[2] These figures do not include waters listed under Category 4-A for atmospheric deposition of mercury.
[3] Includes 6 Category 2 lakes (22 acres) on coastal islands, which are not assigned to mainland HUCs.
[4] The number of wetland stations provided is the actual number of stations assessed, which may be greater than the number of AUs in a particular category because some AUs include more than one station.
[5] Wetland acreage summaries are included for only those AUs that have been delineated. Category 2 is an underestimate since only 41 out of 83 AUs have been quantified.
[6] This value represents the area regulated by the Maine Department of Marine Resources for shellfish harvest.
[7] This value includes a more accurate area of state jurisdictional estuarine and marine waters generated during the creation of new assessment units for the 2022 cycle.
[8] All estuarine and marine waters capable of naturally supporting lobster propagation are affected by a shellfish (lobster tomalley) consumption advisory due to the presence of PCBs and dioxins. A statewide marine consumption advisory for several saltwater finfish and shellfish species is also in effect based on elevated mercury, PCB and dioxin levels. These Category 5 totals do not include marine waters under these statewide consumption advisories.

Table 4- 10 Individual Designated Use Support Summary for Maine Rivers and Streams
All sizes are presented in miles and were generated by ATTAINS.

USE	Total Size	Size Assessed	Size Fully Supporting	Threatened	Size Not Supporting	Size with Insufficient Info
Agricultural Supply	35,218	35,218	8,258	0	0	26,960
Drinking Water Supply After Disinfection	23,212	23,212	5,359	0	0	17,853
Drinking Water Supply After Treatment	12,006	12,006	1,402	0	3	10,601
Fish and Other Aquatic Life	35,218	35,218	33,931	0	799	488
Fish Consumption	35,218	35,218	6,134	0	744	28,340
Fishing[1]	35,218	35,218	6,764	0	0	28,454
Hydroelectric Power Generation	24,214	24,214	2,705	0	0	21,510
Industrial Process and Cooling Water Supply	24,238	24,238	2,710	0	0	21,528
Navigation	35,218	35,218	6,765	0	0	28,453
Primary Contact Recreation	35,218	35,218	6,563	0	200	28,454
Secondary Contact Recreation	35,218	35,218	6,560	0	192	28,466

[1] All freshwaters are listed for a fish consumption advisory due to mercury (Category 4-A - EPA approved Regional Mercury TMDL). The Fish Consumption listing is for additional consumption advisories beyond that caused by mercury (these waters also have a mercury advisory).

Table 4- 11 Individual Designated Use Support Summary for Maine Lakes

CWA Goals	Designated Use	Size Fully Supporting – Attaining WQ Standards (Acres)	Size Not Supporting – Not Attaining WQ Standards (Acres)	Size Not Attainable – UAA Performed
Protect & Enhance Ecosystems	Aquatic Life Support	892,070[1]	85,722	9,160[2]
Protect & Enhance Public Health	Fish Consumption (Hg)	0	986,952	0
	Swimming	962,887	24,065	0
	Secondary Contact	986,952	0	0
	Drinking Water Source Water	986,952	0	0
Social & Economic	Agricultural	986,952	0	0
	Fishing	986,952	0	0
	Industrial	986,952	0	0
	Cultural or Ceremonial	986,952	0	0
	State Defined: Hydropower	986,952	0	0
	State Defined: Navigation	986,952	0	0

[1] Includes Fully Supporting (Cat. 1: 295,418 acres) and Insufficient Information but assumed to be Fully Supporting (Cat. 2: 605,812 acres) less UAA acreage.
[2] Includes acreages of Ragged (2,712 acres) and Seboomook (6,448 acres) Lakes.

Table 4- 12 Individual Designated Use Support Summary for Maine Wetlands

All sizes are presented in acres and were generated by ATTAINS.

USE	Total Size	Size Assessed	Size Fully Supporting	Threatened	Size Not Supporting	Size with Insufficient Info
Agricultural Supply	14,199	14,199	3,365	0	0	10,834
Drinking Water Supply After Disinfection	11,171	11,171	192	0	0	10,979
Drinking Water Supply After Treatment	3,028	279	279	0	0	2,750
Fish and Other Aquatic Life	14,199	14,199	6576	0	689	6,934
Fish Consumption[1]	14,199	14,199	259	0	382	13,558
Fishing	14,199	14,199	471	0	0	13,728
Hydroelectric Power Generation	12,439	12,439	471	0	0	11,968
Industrial Process and Cooling Water Supply	12,439	12,439	471	0	0	11,968
Navigation	14,021	14,021	471	0	0	13,550
Primary Contact Recreation	14,199	14,199	465	0	0	13,734
Secondary Contact Recreation	14,199	14,199	465	0	0	13,734

[1] All freshwaters are listed for a fish consumption advisory due to mercury (Category 4A-EPA approved Regional Mercury TMDL). The fish consumption (other) listing is for additional consumption advisories beyond than that caused by mercury (these waters also have a mercury advisory).

Table 4- 13 Individual Designated Use Support Summary for Maine Estuarine and Marine Waters

Size units are square miles unless otherwise noted and were generated by ATTAINS.

USE	Total Size	Size Fully Supporting	Size Threatened	Size Not Supporting	Size with Insufficient Info
Aquaculture	2,889	12.41	0	0	2,876
Fish Consumption[1]	2,889	0	0	0	2,889
Fishing	2,889	12.41	0	0	2,876
Hydropower	2,607	12.41	0	0	2,594
Industrial Supply Water	2,607	12.41	0	0	2,594
Marine Life	2,889	2,876	0	12.41	0
Navigation	2,889	12.41	0	0	5,367
Primary Contact Recreation Coastal Designated Beaches	2,889 39.02 miles	0 36.99 miles	0 0 miles	0 0.82 miles	2,889 1.21 miles
Restricted Shellfish Harvesting	22.63	2.09	0	0.99	19.55
Secondary Contact Recreation	2,889	0	0	0	2,889
Shellfish Harvesting	2,861	2,488	0	36.01	336.7
Shellfish Propagation	2,889	12.41	0	0	2,876

[1] Based on a statewide fish/shellfish consumption advisory.

Table 4- 14 Total Sizes of Category 4 and 5 Impaired Maine Rivers and Streams by Listing Cause/Stressor Type

Cause/Stressor Type	Size Impaired (miles)
Toxics	**751**
Toxic organics	**432**
Polychlorinated biphenyls (PCBs)	429
Dioxin (including 2,3,7,8-TCDD)	369
Pesticides	**319**
DDT	315
Aquatic life criteria (integrated effects including biocriteria, habitat and nutrient biological indicators)	**502**
Oxygen depletion	**482**
Dissolved oxygen	461
Biochemical Oxygen Demand (BOD)	21
Nutrients	**249**
Nutrient/eutrophication biological indicators	180
Pathogens (*E. coli*)	**192**
NPS + CSO-sources	(variable miles)
pH	**32**
Toxic inorganics	**57**
Metals	40
Flow regime modification	**20**
Sedimentation	**15**
Fish passage barrier	**13**
Harmful algae blooms (CHL a)	**8**

Table 4- 15 Total Sizes of Category 4 and 5 Impaired Maine Lakes by Listing Cause/Stressor Type (Total acreage)

Cause/Stressor Type	Size Impaired (acres)
Methylmercury	986,952
Habitat Alterations	48,989
Phosphorus (Total)	36,733
Secchi Disk Transparency	36,733
Turbidity	7,865

Table 4- 16 Total Sizes of Category 4 and 5 Impaired Maine Lakes by Listing Cause/Stressor Type (by Category)

Listing Category	Cause/Stressor Type	Size Impaired (acres)	Number Impaired
4A	Methylmercury	986,952	5780
	Dissolved Oxygen	634	1
	Phosphorus (Total)	26,951	23
	Secchi disk transparency	26,951	22
4C	Habitat Alterations	48,989	6
	Turbidity	7,865	1
5A	Secchi disk transparency	1,543	2
	Phosphorus (Total)	1.543	2
5-Alt	Secchi disk transparency	8,239	1
	Phosphorus (Total)	8,239	1

Table 4- 17 Total Sizes of Category 4 and 5 Impaired Maine Wetlands by Listing Cause/Stressor Type

Wetland acreage summaries were generated by ATTAINS.

Cause/Stressor Type	Size Impaired (acres)
Benthic Macroinvertebrates Bioassessments	689
Dioxin (including 2,3,7,8-TCDD)	212
Polychlorinated biphenyls	212
DDT (DICHLORODIPHENYLTRICHLOROETHANE)	170
Other flow regime alterations	22

Table 4- 18 Total Sizes of Category 4 and 5 Impaired Maine Estuarine and Marine Waters by Listing Cause/Stressor Type

Sizes except for 'Toxics (PCBs, Dioxins)' were generated by ATTAINS. 'Toxics' is based on a statewide fish/shellfish consumption advisory

Cause/Stressor Type	Size Impaired (sq. miles unless otherwise noted)
Toxics (PCBs, Dioxins)[1]	2,889
Bacteria (Fecal Coliform)	37
CSO sources	Variable
Dissolved Oxygen	5
Toxicity	3
Cause Unknown	2

Cause/Stressor Type	Size Impaired (sq. miles unless otherwise noted)
Estuarine Bioassessments	2
Nutrient/Eutrophication Biological Indicators	2
Copper	0.89
Bacteria (Enterococcus at coastal designated beaches)	0.82 miles
Tidal Flow Alteration	0.51

Table 4- 19 Total Sizes of Category 4 and 5 Impaired Maine Rivers and Streams by Source Category

Sizes, except for 'Atmospheric Deposition – Toxics (mercury)', were generated by ATTAINS. The mileage for Atmospheric Deposition is the total miles of rivers and streams per NHD, see Table 3- 1.

Source Category	Size Impaired (miles)
Atmospheric Deposition – Toxics (mercury)	45,008
Agriculture	522
Non-Point Source	472
Industrial Point Source Discharge	431
Source Unknown	385
Municipal Point Source Discharges	185
Unspecified Urban Stormwater	116
RCRA Hazardous Waste Sites	58
Dam or Impoundment	51
Impervious Surface/Parking Lot Runoff	49
Upstream Source	45
Wet Weather Discharges (Point Source and Combination of Stormwater, SSO or CSO)	38
Habitat Modification - Other than Hydromodification	35
Erosion and Sedimentation	32
Illegal Dumps or Other Inappropriate Waste Disposal	27
Airports	19
Aquaculture (Permitted)	19
Water Diversions	18
Sewage Discharges in Unsewered Areas	17
Livestock (Grazing or Feeding Operations)	13
Landfills	10
Sources Outside State Jurisdiction or Borders	9
Wet Weather Discharges (Non-Point Source)	9
Impacts from Abandoned Mine Lands (Inactive)	2
Naturally Occurring Organic Acids	2
Unspecified Land Disturbance	2
Mine Tailings	1
Impacts from Hydrostructure Flow Regulation/Modification	1

Table 4- 20 Total Sizes of Category 4 and 5 Impaired Maine Lakes by Source Category

Source Category	Size Impaired (acres)
Atmospheric Deposition – Toxics	986,952
Impacts from Hydrostructure Flow Regulation/modification	48,964
Rural (Residential Areas)	21,730
Residential Districts	13,358
Internal Nutrient Recycling	11,900
Unspecified Unpaved Road or Trail	11,535

Source Category	Size Impaired (acres)
Unspecified Urban Stormwater	11,535
Non-irrigated Crop Production	10,532
Natural Sources	10,144
Crop Production (Crop Land or Dry Land)	7,350
Livestock (Grazing or Feeding Operations)	5,018
Municipal Point Source Discharge	4,288
Industrial Land Treatment	1,820
Industrial Point Source Discharge	1,133
Flow Alterations from Water Diversions	30
Landfills	29
Illegal Dumps or other Inappropriate Waste Disposal	25

Table 4- 21 Total Sizes of Category 4 and 5 Impaired Maine Lakes by Source Category (by Listing Category)

Listing Category	Source Category	Size Impaired (acres)	Number of Lakes
4-A	Atmospheric Deposition - Toxics	986,952	5780
	Rural (Residential Areas)	21,320	16
	Internal Nutrient Recycling	11,490	7
	Non-irrigated Crop Production	10,532	5
	Crop Production (Crop Land or Dry Land)	6,940	6
	Residential Districts	5,119	3
	Livestock (Grazing or Feeding Operations)	5,018	4
	Municipal Point Source Discharges	4,288	1
	Unspecified Unpaved Road or Trail	3,296	2
	Unspecified Urban Stormwater	3,296	2
	Natural Sources	1,869	2
	Industrial Land Treatment	1,820	2
	Flow Alterations from Water Diversions	30	1
	Landfills	29	1
4-C	Impacts from Hydrostructure Flow Regulation/modification	48,964	5
	Natural Sources	7,865	1
	Illegal Dumps or other Inappropriate Waste Disposal	25	1
5-A	Industrial Point Source Discharge	1,133	1
	Crop Production (Cropland or Dryland)	410	1
	Internal Nutrient Cycling	410	1
	Rural (Residential Areas)	410	1
	Natural	410	1
5-Alt	Residential Districts	8,239	1
	Unspecified Unpaved Road or Trail	8,239	1
	Unspecified Urban Stormwater	8,239	1

Table 4- 22 Total Sizes of Category 4 and 5 Impaired Maine Wetlands by Source Category

Wetland acreage summaries were generated by ATTAINS.

Source Category	Size Impaired (acres)
Non-Point Source	326.29
Agriculture	286.29
Source Unknown	246.65
Industrial Point Source Discharge	212
Impacts from Hydrostructure Flow Regulation/modification	149.18
Upstream Source	135.2
Unspecified Urban Stormwater	59
Habitat Modification - other than Hydromodification	33
Irrigated Crop Production	22
Impervious Surface/Parking Lot Runoff	9
Illegal Dumps or Other Inappropriate Waste Disposal	6

Table 4- 23 Total Sizes of Category 4 and 5 Impaired Maine Estuarine and Marine Waters by Source Category

Sizes generated by ATTAINS. Legacy Pollutants are based on a statewide fish/shellfish consumption advisory.

Source Category	Size Impaired (sq. miles)
Estuarine and Marine Waters	
Legacy Pollutants	2,889
Municipal Point Sources	4
Unknown	4
Combined Sewer Overflows	3
Non-Point Source	3
Urban Stormwater	2
RCRA Hazardous Waste Sites	2
Coastal designated beaches	**Size Impaired (miles)**
Unknown	0.82

RIVERS / STREAMS

Water Classification Program

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Related Website: www.maine.gov/dep/water/monitoring/classification/index.html

Maine's Water Classification Program is codified in 38 M.R.S. §§ 464-470. The Program establishes four water quality classes for rivers and streams: AA, A, B, and C (38 M.R.S. § 465). Each classification assigns designated uses and narrative or numeric water quality criteria, and places specific restrictions on certain activities (Table 4- 1 and Table 4- 24) so that the goal conditions of each class may be achieved or maintained. Definitions of terms used in the classification are provided in 38 M.R.S. § 466.

Class AA waters are managed for their outstanding natural ecological, recreational, social, and scenic qualities. Direct discharge of pollutants is allowed but highly restricted. Dams and other significant human disturbances are prohibited.

Class A waters are managed for high quality with limited human disturbance allowed. Direct discharges are allowed but highly restricted. Physical and chemical characteristics should be similar to natural conditions.

Class B waters are general-purpose waters and are managed to attain good physical, chemical and biological water quality. Well-treated discharges with ample dilution are allowed.

Class C waters are managed to attain at least the swimmable-fishable goals of the Federal CWA, including support of indigenous fish species. Aquatic life standards require maintenance of the structure and function of the biological community.

Table 4- 24 Maine Water Quality Criteria for Classification of Fresh Surface Waters (38 M.R.S. § 465)

	Dissolved Oxygen Numeric Criteria	Bacteria* (*E. coli*) Numeric Criteria	Habitat Narrative Criteria	Aquatic Life (Biological) Narrative Criteria
Class AA	As naturally occurs	As naturally occurs but may not exceed geometric mean of 64 CFU/100 mL over 90-day interval or 236 CFU/100 mL in more than 10% of samples in any 90-day interval	Free flowing and natural	Direct discharge of pollutants is allowed but highly restricted; *as naturally occurs*.**
Class A	7 ppm or 75% saturation From 10/1 to 5/14, 7-day mean concentration not less than 9.5 ppm and 1-day minimum concentration not less than 8.0 ppm in identified fish spawning areas	As naturally occurs but may not exceed geometric mean of 64 CFU/100 mL over 90-day interval or 236 CFU/100 mL in more than 10% of samples in any 90-day interval	Natural	Direct discharges are allowed but highly restricted; *as naturally occurs*.**

	Dissolved Oxygen Numeric Criteria	Bacteria* (*E. coli*) Numeric Criteria	Habitat Narrative Criteria	Aquatic Life (Biological) Narrative Criteria
Class B	7 ppm or 75% saturation From 10/1 to 5/14, 7-day mean concentration not less than 9.5 ppm and 1-day minimum concentration not less than 8.0 ppm in identified fish spawning areas	May not exceed geometric mean of 64 CFU/100 mL over 90-day interval or 236 CFU/100 mL in more than 10% of samples in any 90-day interval from 4/15 to 10/31	Unimpaired	Discharges may not cause adverse impact to aquatic life in that the receiving waters must be of sufficient quality to support all indigenous aquatic species without detrimental changes to the resident biological community.**
Class C	5 ppm or 60% saturation but must maintain WQ sufficient for spawning in identified fish spawning areas 6.5 ppm (monthly average) at 22° and 24°C	May not exceed geometric mean of 100 CFU/100 mL over 90-day interval or 236 CFU/100 mL in more than 10% of samples in any 90-day interval from 4/15 to 10/31	Habitat for fish and other aquatic life	Discharges may cause some changes to aquatic life, but the receiving waters must be of sufficient quality to support all species of indigenous fish and maintain the structure and function of the resident biological community.**

* Table 4- 1 includes reference to federal criteria in 40 C.F.R. § 131.43(a).

** Numeric criteria for macroinvertebrate assemblages in *Classification Attainment Evaluation Using Biological Criteria for Rivers and Streams, 06-096 C.M.R. ch. 579.*

The current (December 2021) distribution of waters assigned to these four water quality classes is summarized in Table 4- 25.

Table 4- 25 Percent Distribution of River/Stream Water Classes

Class	Percent of Major Mainstem River* Miles	Percent of Total River and Stream Miles
AA	29.5 %	6.3 %
A	26.9 %	47.2. %
B	27.7 %	45.4 %
C	15.9 %	1.2 %

* Major mainstem rivers are rivers that have a watershed of >500 square miles.

Maine law requires that once every three years, the Department review the classification system and related standards and make recommendations to the Board of Environmental Protection (BEP) for any needed changes in the water quality classifications assigned to specific waterbodies. For more information, please see pages 27-28.

Summary of Statewide River and Stream Attainment Status

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The Integrated Report requires the assignment of each AU into one of five categories (see Assessment Methodology, above). A water is determined to be impaired if one or more of the uses assigned by its classification is not attained, as determined by the criteria assigned to that water class. An overall use attainment summary is provided in Table 4- 9 and Table 4- 10. The 2018/2020/2022 (‘2022’ or ‘’22’ for short) use attainment assessment reports on AUs amounting to 35,242 miles of rivers and streams that are tracked in the ATTAINS database. Information on the status of

individual AUs may be found in Listings on Individual Waters, Appendix II, Categories 1-5. A spatial representation of many AUs can be viewed using this ArcGIS Online Project (note that the project is under development): https://bit.ly/MaineIRMap .

AUs can be placed in different Categories (3-5) for different (potential) impairments. For example, an AU may be in Category 4-A for a contact recreation impairment due to the 2009 Statewide Bacteria TMDL; simultaneously, it may be in Category 5-D for legacy pollutants. The mileage totals shown in Table 4- 26 are for 'single category' reporting, meaning each AU is only counted once, namely in the highest category it is in. For the example above, the AU would only be counted under Category 5.

It should also be noted that ongoing improvements in mapping technology (higher resolution) and correction of errors affect the mileages assigned to each category in a given reporting cycle. Where such factors affected 2016 mileages, this information is provided below.

As with any assessment of this kind, the identification of impaired waters or delisted waters cannot be considered complete but rather is a reflection of the findings at a particular point in time, relative to the level of monitoring effort expended by the agency and other cooperating contributors.

Table 4- 26 Summary of Changes to Surface Water Assessment Categories – 2016 to 2022[1]

Rivers and Streams						
35,029 = Total Miles Assessed in 2016						
35,2182 = Total Miles Assessed in 2022						
	2016 Miles in Category[2]	**% of Total 2016 Assessed Miles**	**2022 Miles in Category[3]**	**% of Total 2022 Assessed Miles**	**% Change '16 - '22**	**Change in Miles '16 - '22**
Category 1	5,958	17.0	5,277	15.0	-2.0	-681
Category 2	27,343	78.1	28,171	80.0	1.9	828
Category 3	361	1.1	350	1.0	-0.1	-11
Category 4	417	1.3	483	1.4	0.1	66
Category 5	951	2.9	938	2.7	-0.2	-13

[1] This table is a partial duplicate of Table 2-1 in Chapter 2; it appears twice for convenience.
[2] Single-Category Reporting miles, as generated by 2016 cycle in ATTAINS precursor, ADB.
[3] Single-Category Reporting miles as generated by 2022 cycle in ATTAINS.

In the summary below, '2022' is used as a shorthand for the current 2018/2020/2022 cycle.

Category 1: Rivers and streams attaining all designated uses and water quality standards, and no use is threatened.

The 2022 assessment assigned 5,277 miles (15%) of rivers and streams to Category 1 (fully attaining all uses other than statewide mercury advisory as explained in Category 5-C below). The Department has determined through monitoring and evaluation that large areas of the state should be included in this category, where significant protection is afforded by either state or private conservation efforts. Maine is fortunate to have entire sub-watersheds where there is little to no human habitation, few roads and only minimal disturbance (typically well managed forestry operations that are well buffered to protect water quality) or significant conservation ownership. Five segments totaling 681 miles were moved from Category 1 to Category 2 in the 2022 cycle because an analysis of the human population in the watershed based on 2010 U.S. Census data indicated that the population now exceeds 0.1 per square mile. (see 'Category 1', item 5, on page 43).

Category 2: Rivers and streams attaining some of the designated uses; no use is threatened; and insufficient data or no data and information is available to determine if the remaining uses are attained or threatened (with presumption that all uses are attained).

The 2022 assessment assigned 28,171 miles (80%) of rivers and streams to Category 2 only (fully attaining all uses other than statewide mercury advisory as explained in Category 5-C below); another 51 miles of rivers and streams are in Category 2 and at least one other category. Five segments totaling 681 miles were moved from Category 1 to Category 2 in the 2022 cycle, see the preceding paragraph for more information. Two segments totaling 10.4 miles were delisted to this category due to water quality standards attainment. New mapping of a number of AUs in this category, and resulting adjustments in unit lengths, caused an increase (137 miles) in total mileage in this category compared to 2016.

Category 3: Rivers and streams with insufficient data and information to determine if designated uses are attained (with presumption that one or more uses may be impaired).

The 2022 assessment assigned 350 miles (1.0%) of rivers and streams to Category 3 only (insufficient information to determine attainment); another 23 miles of rivers and streams are in Category 3 and at least one other category (total of 374 miles). Most of these segments have been assigned to Category 3 because of inconclusive or conflicting monitoring data. Two new segments (total of 7.7 miles) were added to Category 3 in 2022 and two segments (total of 14.5 miles) were moved from Category 3 to Category 5-A.

Category 4: Rivers and streams that are impaired or threatened for one or more designated uses, but do not require development of a TMDL.

Category 4 impaired waters do not require the development of a TMDL. The 2022 assessment assigned 483 miles (1.4%) of rivers and streams to Category 4. Waters in Category 4 are placed into one of three subcategories:

- 4-A for waters that already have a TMDL that has been approved by EPA
  - Segments totaling 349 miles are listed in this subcategory only; segments totaling 111 miles are listed in this subcategory and at least one other (sub)category.
  - Fourteen segments totaling 84 miles were added to Category 4-A due to their inclusion in an addendum to the Maine Statewide Nonpoint Source TMDL, approved by EPA on September 23, 2021.
- 4-B for waters where there is an enforceable mechanism in place to bring the water into attainment (e.g. new or renewed wastewater discharge license; court order, etc.)
  - Segments totaling 109 miles are listed only in this subcategory; segments totaling 314 miles are listed in this subcategory and at least one other (sub)category.
  - One segment (3.2 miles) was moved from Category 5-A to 4-B due to a new permit (enforceable mechanism to bring the waters into attainment) that will address the existing impairment. One segment (1.0 mile) was split out from an existing waterbody in Category 4-B due a differing water quality class and added to this category.
- 4-C for waters where impairment is not caused by a pollutant.
  - Segments totaling 23 miles are listed only in this subcategory; segments totaling 9.5 miles are listed in this subcategory and at least one other (sub)category.

Category 5: Rivers and streams that are impaired or threatened for one or more designated uses by a pollutant(s) and a TMDL is required.

The 2022 assessment assigned 938 miles (2.7%) of rivers and streams to Category 5 (impaired for one or more uses as well as statewide mercury advisory as explained in Category 5-C below). Waters in Category 5 are placed into one of four subcategories:

- 5-A for waters impaired by pollutants; a priority for TMDL development
  - Segments totaling 190 miles are listed only in this subcategory; segments totaling 107 miles are listed in this subcategory and at least one other (sub)category.
  - Fourteen segments totaling 84 miles were moved from Category 5-A to Category 4-A due to their inclusion in an addendum to the Maine Statewide Nonpoint Source TMDL, approved by EPA on September 23, 2021. One segment (3.2 miles) was moved to Category 4-B due to a new permit
  - A total of 15 segments totaling 61 miles were added to this subcategory in 2022 due to new monitoring data showing impairments.
- 5-B for waters impaired by bacteria contamination only
  - No segments are in this subcategory in 2022.
- 5-C for waters impaired by atmospheric deposition of mercury (inactive category due to EPA approved Regional Mercury TMDL)
  - All freshwaters in Maine have an advisory for the consumption of fish due to the presence of mercury presumed to be from atmospheric deposition. A Regional Mercury TMDL was approved by EPA making these waters Category 4-A.
  - This Integrated Report does not consider this statewide advisory in establishing other category listings.
  - The advisory is based on probability data that a stream, river, or lake may contain some fish that exceed the advisory action level [Maine uses a lower action level of 0.2 mg/kg (edible portion) than that established by the EPA]. Any freshwater may contain both contaminated and uncontaminated fish depending on size, age, and species occurrence in that water. The advisory applies to all freshwaters because it may not be possible for someone eating a fish to tell where the fish originated and whether or not it has a high level of mercury.
- 5-D for waters impaired by the residuals of “legacy” activities
  - No changes were made in this subcategory in 2022.

NUMBER OF SEGMENTS THAT WERE DELISTED

Due to EPA approval of an addendum to the Statewide Nonpoint Source Pollution TMDL on September 23, 2021 the aquatic life use impairments of 16 river and stream segments were moved from Category 5-A to Category 4-A (Table 8-6). Two waterbodies were delisted from Category 5-A to Category 2 due to newer data or new data analysis showing water quality standards attainment. One waterbody was moved from Category 5-A to Category 4-B due the implementation of a 4-B restoration approach, i.e. a MEPDES permit. Two new Category 5-A segments were moved to Category 4-A because the impairments were addressed in previously approved TMDLs. See Table 8- 6 in Chapter 8 for a complete listing of all new delistings.

Causes and Sources of Impairment in Categories 4 and 5

Cause and stressor type information for rivers and streams is provided in Table 4- 14; sources of impairment are provided in Table 4-19. It is important to understand that

miles attributed to causes and sources in these two tables may be listed more than once if a waterbody is subjected to several different types of disturbance.

DEP tracks cause and source information using ATTAINS, which enables increasingly accurate and consistent tracking of this information as the database is populated and updated from cycle to cycle.

CAUSES

The greatest number of impaired miles (752; see Table 4- 14) is due to toxic contamination from organics and pesticides, including legacy pollutants such as PCBs, dioxin and DDT. For most mainstem river segments that are affected by pulp and paper mill discharges, dioxins have been listed in Category 4-B since 2004. Measureable differences above and below sources of dioxin are no longer detectable. However, those same segments are listed in Category 5-D for legacy sources of PCB contamination found in fish tissue. These legacy pollutants cannot be addressed with permits or TMDLs; pollutant effects will continue to diminish naturally over time.

The second largest number of impaired miles (502) is due to non-attainment of aquatic life criteria as determined by observations of biological effects. Most of these miles were assessed via benthic macroinvertebrate biocriteria although the number of segments also assessed via the algae/periphyton community increased by 13 segments. Of similar magnitude (482 miles) is the number of impaired miles due to oxygen depletion, affecting aquatic life uses. Other notable causes include nutrients (249 miles) and pathogens (*E. coli*; 192 miles).

SOURCES

Atmospheric deposition of toxics (mercury) affects all waters of the State and is the largest single source of pollution (see Table 4- 14). Agriculture, nonpoint sources, and industrial point source discharges are of similar importance (522, 472 and 431 miles, respectively), followed by unknown sources (385 miles).

Mainstems of Major Rivers

Related Website: www.maine.gov/dep/water/monitoring/rivers_and_streams/modelinganddatareports/index.html

The primary cause of impairment on the mainstems of major rivers (those with a watershed of >500 square miles) is non-attainment of the Fish Consumption use, with segments of the Androscoggin, Kennebec, Penobscot, Salmon Falls and Sebasticook Rivers listed in either Category 4-B or Category 5-D. These impairments were identified from tissue monitoring studies that found legacy PCB and dioxin contamination in mainstem rivers. Aside from these impairments, most of the mainstem rivers are in good condition and are attaining their classification, generally Class B or C[12]. Significant segments of the St. John, Allagash, East and West Branches of the Penobscot, St. Croix, and Kennebec Rivers are Class AA and A.

CSOs continue to occur on segments of major rivers; for more information, see Chapter 3, 'Maine Combined Sewer Overflow Program'. In 2009, the Department completed a

[12] Note that all freshwaters in Maine are subject to a statewide fish consumption advisory due to "Impairment caused by atmospheric deposition of mercury" (see 'Listing Methodology for this 305(b)/303(d) Integrated Report List', above).

statewide bacteria TMDL that establishes a restoration and management plan for all sources of bacteria, including CSOs.

AROOSTOOK RIVER

A 2001/2002 DEP study of the Aroostook River below the confluence of Presque Isle Stream revealed a number of water quality problems related to high nutrient levels, including large diurnal fluctuations of DO, elevated CHL a concentrations, extensive algal growth and some exceedances of pH criteria. The study indicated that problems were more pronounced below point source discharges than above them; however the study did not measure NPS inputs. Therefore, the water quality model based on the 2001 data showed that most of the nutrients in the river originated from discharges. Nutrient inputs caused excessive algal growth which in turn led to large diurnal DO fluctuations. In 2012, a follow-up study confirmed the large DO swings and documented large diurnal fluctuations in pH with widespread and frequent exceedances of Maine's pH criteria. As in the case with DO, nutrients are also the causal factor for pH fluctuations and resulting criteria violations. In addition to studying the main stem of the Aroostook River, water quality studies on a number of tributaries in this reach have also been performed. Two of these tributaries, Merritt and Everett Brooks, are currently listed as not attaining for Aquatic Life Use (Category 4-A due to 2016 approval of Statewide NPS TMDL). Another six streams (Birch, Cowett, Amsden, Hacker and Gray Brooks, as well as Unnamed Brook – Presque Isle) are being listed for the first time in the 2018/2020/2022 Report in Category 5-A as not attaining for Aquatic Life Use; one other stream (Kennedy Brook) is newly listed in Category 4-A. All nutrient loading in these tributary watersheds is NPS-related. In 2018/2019 a joint study with University of Maine identified a unique chemical control on dissolved phosphorus mobilization in the calcareous sediment materials in the agricultural streams during base flow. This interaction between surfacing groundwater and the atmosphere naturally raises the pH to 8.5 resulting in the release of phosphorus from agriculturally derived sediments.

In the 2014 Integrated Report, the Aroostook River between the confluence with Presque Isle Stream and 3 miles upstream of the (former) Caribou water supply intake (ME0101000413_148R) and the two downstream segments (ME0101000413_148R01 and ME0101000413_148R02) of the river that extend to the Canadian border were moved to Category 5-A for an aquatic life impairment due to pH. The Department is pursuing an adaptive management approach (e.g. reducing discharge permit limits; promoting Best Management Practices) to address the existing problems. Continuous pH data collected in 2017 and 2019 in the Aroostook River in Fort Fairfield (ME0101000413_148R02) showed ongoing excursions of the current pH criterion of 8.5.

MEDUXNEKEAG RIVER

Historic data submitted by the Houlton Band of Maliseet Indians Water Resources Program documented high algal growth and large diurnal swings in DO on the Meduxnekeag River mainstem below Houlton. These problems have abated in recent years. The river below the confluence with the South Branch Meduxnekeag River is currently in Category 5-D for legacy pollution with DDT and also in Category 4-A for elevated phosphorus (EPA TMDL approval in 2001). In the 2014 cycle, a new impairment to the aquatic life use was added to the lowermost ~7 miles of the river because algal communities did not meet narrative aquatic life standards. This impairment was delisted to Category 2 in the 2029/2020/2022 Report because a re-

analysis of historic data, and new (2017) data show that narrative aquatic life criteria are attained. Please also see 'Delisting of Aquatic Life Use Impairments in Category 5-A Water to Category 2', 'Meduxnekeag River (Houlton and Littleton)' on pages 152-153.

The Meduxnekeag River upstream of the South Branch has been listed in Category 3 since the 2010 reporting cycle and data collection activities are ongoing. Extensive wetlands along this section of the river may be contributing to low DO levels. In 2013-14, the Natural Resources Conservation Service (NRCS) provided technical assistance and funding (Environmental Quality Incentives Program funds through the National Water Quality Initiative) to several landowners to improve conservation practices on agricultural lands in the Nickerson Lake sub-watersheds to help reduce impairments in the Meduxnekeag River. From 2015-2019, the NRCS provided technical and funding assistance through the National Water Quality Initiative to watershed landowners to improve conservation practices on agricultural lands to help restore the Meduxnekeag River. Watershed restoration activities ongoing including Phase I project (2017-2019) and Phase II project (started 2020).

PENOBSCOT RIVER

A total of seven segments on the mainstem of the Penobscot River from the confluence of the East and West Branches to Reeds Brook (Hampden) and the West Branch Penobscot River between Millinocket Stream and East Branch Penobscot River are listed as impaired for aquatic life use because of previously documented non-attainment of DO criteria and problems with nutrient/eutrophication biological indicators. In May of 2011, new MEPDES permits incorporating phosphorus discharge limits for all mills on the freshwater portion of the river were issued, putting in place water quality protection based on actual waste load allocations. As a result of this permitting action, the impaired segments were moved to Category 4-B (Pollution Control Requirements Reasonably Expected to Result in Attainment) in the 2012 reporting cycle[13]. As part of the permit conditions, the Department and permittees have been conducting ambient and effluent monitoring along the segments covered by the permit to assess the effectiveness of the new discharge limits. Continuous data collected in 2011 and 2012 indicated that DO criteria were attained. 2013-2019 instantaneous data indicate attainment of DO criteria; collect continuous data to confirm criteria attainment.

ANDROSCOGGIN RIVER

A 2010 addendum to the 2005 Final Androscoggin River TMDL (Gulf Island Pond and Livermore Falls Impoundment), as well as modifications to the Water Quality Certification of the Gulf Island Deer Rips Hydro project and MEPDES permits for two pulp and paper companies, resulted in revised discharge limits for Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), and Total Phosphorus (TP) and improved oxygenation of Gulf Island Pond (GIP) in the Androscoggin River. Due to this permitting action, the GIP segment (ME0104000208_424R_01) was moved to Category 4-B in the 2012 reporting cycle. Water quality has improved substantially in GIP and the river downstream of the Gulf Island Dam since 2010, and Class C dissolved oxygen (DO) criteria are met at all times. One exception is the 'deep hole' in Gulf Island Pond, which still does not meet DO standards due primarily to sediment

[13] The West Branch Penobscot River and the uppermost mainstem segments were moved to Category 4-B in the 2010 cycle based on a consent agreement issued in 2008.

oxygen demand resulting from historic discharges. In the river below GIP, volunteer data collected under DEP's Volunteer River Monitoring Program (VRMP) show that over the past approximately 10 years Class B DO and bacteria standards were met most of the time.

In 2009, the Lower Androscoggin River (Worumbo Dam, Lisbon Falls to Merrymeeting Bay, Brunswick/Topsham) was proposed for upgrade from Class C to Class B. The Board of Environmental Protection declined to recommend the upgrade, as did the Maine Legislature. However, a Resolve was passed by the Legislature directing the Department to accelerate monitoring and modeling on this segment in the interest of reviewing this proposal in the future. A water quality field survey was completed in the summer of 2010. A water quality model was developed in 2011, which predicted that the Class B criterion could not be met under critical water quality conditions.

In 2018, an upgrade for the same segment was again proposed, and again the Board and Maine Legislature declined to recommend it. In 2020, the Maine Legislature considered a bill (legislature.maine.gov/LawMakerWeb/summary.asp?ID=280079141) to upgrade a segment from the Gulf Island Pond Dam to Merrymeeting Bay but ultimately carried the bill over to the subsequent session. In DEP's 2020 Triennial Review (see pages 27-28 and www.maine.gov/dep/water/wqs/triennial-review.html), the same segment was also proposed for upgrade. In December 2020, the Board recommended a more limited upgrade, from Worumbo Dam, Lisbon Falls to Merrymeeting Bay to the Legislature, which will consider the proposal in the legislative session beginning in January 2022.

The segment of the lower Androscoggin River between the Pejepscot Dam and the Brunswick Dam is listed in Category 4-C (impaired by non-pollutant) based on information from DMR that this segment fails to support an indigenous species of fish, the American shad, as required by statute. The dam at Brunswick and the associated fish passage device fail to allow passage of a sufficient number of shad to establish a sustainable population in the river above the dam. This facility is licensed by the Federal Energy Regulatory Commission (FERC) and has a requirement for fish passage as part of a State-adopted restoration plan for this species. The FERC license for the Brunswick Dam is due for renewal in 2029 and it is expected that DMR and other fisheries agencies will require improved fish passage.

PRESUMPSCOT RIVER

On the Presumpscot River, a 1998 TMDL stated that Class B DO criteria were not always attained in the early to mid-1990s at the Little Falls, Mallison Falls, and Saccarappa dam impoundments. It was recommended that additional data should be collected, and if non-attainment continued a TMDL should be implemented for nonpoint sources.

The non-attainment of DO criteria was addressed in the 2007 Water Quality Certification (WQC) for the five dams of the "Presumpscot River Hydro Projects", which required increased spillage from the Dundee Pond and Gambo Falls dams and water quality monitoring to determine whether Class B DO standards were met. Annual monitoring reports for 2008-2011 showed few DO excursions, indicating that non-attainment is associated with low flow discharges from Sebago Lake through the Eel Weir Dam. To address this problem, the WQC and Federal Energy Regulatory Commission (FERC) license for this dam issued in March 2015, and the related Lake Level Management Plan for Sebago Lake (from May 2011) stipulated that minimum flows from the dam must be increased from 270 cfs (cubic feet per second) to 408 cfs

from June 1 to September 30 annually to improve spillage from the Dundee Pond and Gambo Falls dams, leading to improved DO conditions in the Presumpscot River. Annual DO monitoring reports submitted by the dam owner show that a flow level of 408 cfs is met except during drought years, due to competing interests to support water level concerns in Sebago Lake. The decision to reduce flows is informed by the ongoing DO monitoring, which has shown continued attainment of Class C DO criteria. Volunteer data collected under DEP's VMRP show that over the past approximately 10 years Class B DO and bacteria standards were met most of the time.

In 2019, the Saccarappa Dam was removed, allowing migratory fish access to more upstream waters. Dischargers to the Class C segment of the river have decreased their discharges to the River over time, most recently in 2020, leading to continued improvements in water quality. Data collected by MDEP in 2020 showed that Class C DO criteria were met at all times in the lowest segment of the River; in 2021, DO criteria were met almost all the time. In DEP's 2020 Triennial Review (see pages 27-28 and www.maine.gov/dep/water/wqs/triennial-review.html), the segment from Saccarappa Falls to tidewater was proposed for upgrade from Class C to Class B. In December 2020, the Board of Environmental Protection declined to recommend this upgrade; this recommendation will be considered by the Maine Legislature in the legislative session beginning in January 2022.

Toxics

SURFACE WATER AMBIENT TOXICS (SWAT) MONITORING PROGRAM

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Related Website: www.maine.gov/dep/water/monitoring/toxics/swat/

Maine's SWAT monitoring program was established in 1993 (38 M.R.S. § 420-B) to determine the nature, scope and severity of toxic contamination in the surface waters and fisheries of the State. The authorizing statute states that the program: 1) must comprehensively monitor the lakes, rivers and streams and marine and estuarine waters of the State on an ongoing basis, 2) must incorporate testing for suspected toxic contamination in biological tissue and sediment, 3) may include testing of the water column, 4) must include biomonitoring and the monitoring of the health of individual organisms that may serve as indicators of toxic contamination, and 5) must collect data sufficient to support assessment of the risks to human and ecological health posed by the direct and indirect discharge of toxic contaminants. The Dioxin Monitoring Program was incorporated into the Surface Water Ambient Toxics (SWAT) monitoring program in 2007. In 2015 the annual report was changed to a biennial report due April 30 of the first regular session of the Maine Legislature. Annual reports for 2013 and 2014 and biennial reports for 2015-2016, 2017-2018 and 2019-2020 may be seen at www.maine.gov/dep/water/monitoring/toxics/swat/index.html. Information regarding sampling for PFAS is included in Chapter 7, 'PerFluoroAlkyl Substances (PFAS) Monitoring', page 135.

Aquatic Life Monitoring

BIOLOGICAL MONITORING OF RIVERS AND STREAMS

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The Biological Monitoring Program assesses the health of rivers, streams, and wetlands by evaluating the composition of the resident biological communities, including macroinvertebrates and algae. In the 1980s, the Maine Legislature passed the Water Classification Law and made an initial assignment of each river and stream reach in the state to one of four established classes (AA, A, B, and C Table 4- 25). Subsequent Water Quality Reclassification initiatives have reassigned waterbodies to more appropriate (usually higher quality) management classifications. Class AA and Class A have the same aquatic life criteria and biological expectations ("as naturally occurs"). Data collected in accordance with Maine's biocriteria protocols are analyzed to predict the likelihood of a waterbody attaining the aquatic life criteria of its assigned class (i.e. AA/A, B, and C). In 2003, DEP adopted numeric biocriteria in *Classification Attainment Evaluation Using Biological Criteria for Rivers and Streams, 06-096 C.M.R. ch. 579.* These rules describe the process and statistical model used to make aquatic life use attainment decisions based on benthic macroinvertebrate communities and are currently applicable to flowing streams and rivers having a hard, eroded substrate. *06-096 C.M.R. ch. 579* will be amended to include a statistical model to predict class attainment based on algal communities, following a standard public review process. In addition, the Biological Monitoring Program developed protocols and statistical models using macroinvertebrates and algae to determine class attainment of slow-flowing streams, rivers and associated wetlands having a soft substrate with shallow aquatic macrophyte beds. These models will also be incorporated into Chapter 579 rules when they are amended. For the 2018/2020/2022 Integrated Report, Department biologists determined attainment of narrative aquatic life criteria already contained in the Water Classification Program (38 M.R.S. § 465) by using expert judgment. Results of these evaluation are included in Appendix II and IV for the stream algal and wetland macroinvertebrate communities, respectively. More detailed information on wetland monitoring and assessment is provided in Chapter 5. Biomonitoring station locations and associated biological and physical data can be found at www.maine.gov/dep/water/monitoring/biomonitoring/data.html .

REPORTS OF FISH KILLS

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The Department documents all pollution-caused fish kills. There were 2, 5, 6, 12, 2, 4, 1, and 12 fish kills for the years 2013 through 2020 respectively. Most were either in lakes where there are no discharges and were post-spawning events, or were of searun alewives in rivers and streams due to low flows and high temperatures. In 2018, a hydropower facility shut off flow to the Stillwater River in Orono killing dozens of river herring on their spawning run. In 2020, a farmer dewatered Dudley Brook in Aroostook County for irrigation killing brook trout. Also in 2020, pouring of fresh concrete into the water to repair the dam at Turner Pond in Somerville killed dozens of fish of various species downstream in Lovejoy Stream.

PROBABILITY-BASED MONITORING

Biological Monitoring Program

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Biological monitoring staff have participated in planning for national surveys of wadeable streams and large rivers.

Salmon Habitat Monitoring Program

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Maine is home to the only remaining populations of wild Atlantic salmon (Salmo salar) in the United States. These constitute the Gulf of Maine Distinct Population Segment (DPS), which has been listed as endangered since 2000. As anadromous fish, salmon face a large suite of threats to survival in both fresh and saltwater environments, including dams, pollution, and (historically) overfishing. Water quality is an essential component of suitable habitat for spawning and rearing. DEP monitors the water quality and biological communities in Maine's Atlantic salmon rivers and streams in close collaboration with state and federal agencies and non-profit groups, with the goal to restore and enhance the populations of this endangered species. Work is guided by Maine's water quality standards (38 M.R.S. § 464 4-A; for further information see Maine's water classifications) and the Collaborative Management Strategy's Atlantic Salmon Recovery Plan. Annual project reports are posted on the program website.

LAKES / PONDS

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This section of the 2022 Integrated Report provides an update to information contained in the 2006 - 2016 Integrated Reports, links to which can be found at: www.maine.gov/dep/water/monitoring/305b

Information in the 2006 report (pages 75 – 91) includes:

Physical Extent of Lakes
Statutory Classification of Lakes
Attainment of Classification
Attainment Evaluation Criteria for each Designated Use
How Attainment Status Relates to Listing Categories
Summary of Listing Category Changes for 2006
Criteria Used to Change Listing Status
An Overview of Maine's Invasive Aquatic Plant Program

Economic Contribution of Lakes to Maine.

Additional topics required under CWA § 314 addressed in the 2006 report include:

Maine's Definition of Significant Lakes
Trophic Status of Significant Publicly Owned Lakes
Lake Rehabilitation Techniques
Acid Effects on Lakes
Toxics in Maine lakes
Trend Analyses and Climate Considerations.

Numerous tables reappear in this report at the request of EPA Region 1 staff.

Data Considered in Current Assessment

Monitoring of Maine lakes continues to rely on a strong volunteer-based program, Lake Stewards of Maine Volunteer Lake Monitoring Program (www.lakestewardsofmaine.org), as well as both targeted and probability-based monitoring performed by state staff. Data received through 2018 was evaluated for this report. When Covid restrictions were enacted in early 2020, 2019 data processing was put on hold for multiple reasons, including a shortage of staff and the inability to physically work together. The same limitations held for processing of 2020 data in early 2021. Efforts are underway to get caught up with processing of data through 2021 as we are fully staffed and the ability to work remotely has improved.

Attainment of Classification

The state designated a subset of the total population of lakes as 'Significant Lakes' as requested by EPA under CWA § 314 in the early 1990s. Table 4- 27 summarizes numbers and acreages for all lakes having an identification number as well as the subset of Significant Lakes.

Table 4- 27 "All" and "Significant" Lake Category Information

Maine Lake Population Summary		
	Number	**Acres**
All Lakes	5,780 (100%)	986,952 (100%)
Significant Lakes	2,313 (40%)	958,977 (97%)

Designated uses actively assessed to determine classification attainment status are: Aquatic Life Support, Fish Consumption, Recreation In/On the Water, and Drinking Water Supply (after disinfection/treatment). Table 4- 28 summarizes how lake attainment status relates to specific Listing Categories used in the 2022 report.

Table 4- 28 Summary of Listing Categories and Subcategories used in the 2016 Assessment of Maine Lakes

Listing Category	Category Summary
1	Attaining all standards
2	Attaining some standards; assumed to attain others
3	Attaining some standards; insufficient / no data / info to determine if standard(s) are met for use that may be impaired
4-A	TMDL complete (includes Regional Hg Deposition TMDL)
4-B	Expected to meet standards

Listing Category	Category Summary
4-C	Impaired by pollution but not impaired by a pollutant
5-A	TMDL needed
5-Alt	TMDL alternative has been submitted

Brief summaries of Listing Categories for lakes follow. Lake-specific changes are included in Chapter 8 as well as in Appendix III. One lake was moved from Category 5-A to 5-Alt (Great Pond, 8,239 acres); one lake was moved from Category 2 to Category 5-A (Alamoosook Lake, 1,133 acres) and one lake was moved from Category 1 to Category 4-C (Otter Pond, 25 acres) during this period. Note that all lakes are also listed in Category 4-A because a regional TMDL was approved to address the fish consumption impairment due to atmospheric deposition of mercury which formerly had all lakes listed in Category 5-C.

Category 1: Lake waters attaining all designated uses and water quality standards, and no use is threatened.

For the purposes of this assessment, lakes having no population in their direct watersheds have been listed in 'Category 1, Attaining all standards' with the exception of four lakes which are listed in Category 4-C, in non-attainment of the Aquatic Life Use (habitat) due to non-pollutant (hydrologic modification). The number of lakes listed in Category 1 is 2,856, totaling 295,418 acres. Waters are summarized by the 10-digit HUC within which they are located (Appendix III, Category 1). One lake (Otter Pond, 25 acres) is the first lake to be moved out of this category since the 2008 reporting cycle; for more information, see Category 4, below. .

Category 2: Lake waters attaining some of the designated use(s), no use is threatened, and insufficient data or no data and information is available to determine if the remaining uses are attained or threatened (with presumption that all uses are attained).

The Department is highly confident that these waters attain the following designated uses: drinking water (after disinfection), recreation in/on the water, fishing (excluding fish consumption), and as habitat for fish and other aquatic life. Category 2 contains 2,893 lakes or 605,812 lake acres. Waters are summarized by the 10-digit HUC within which they are located (Appendix III, Category 2). One lake (Alamoosook Lake, 1,133 acres) was moved out of this Listing Category to Category 5-A during this reporting cycle – the first since 2012. Data indicate that the hatchery discharge is responsible for a deterioration of trophic state, which violates Class GPA.

Category 3: Lake waters with insufficient data and information to determine if designated uses are attained (with presumption that one or more uses may be impaired).

Currently there are no lakes in Category 3. No lakes have moved in or out of this Listing Category since the 2012 reporting cycle.

Category 4: Lake waters that are impaired or threatened for one or more designated uses, but do not require development of a TMDL.

There are currently 28 lakes covering 75,940 acres listed in Category 4. These lakes fall into two subcategories: waters on which TMDLs have been completed (4-A) and waters with impairments not caused by a pollutant (4-C). Category 4-A contains 22 lakes totaling 26,951 acres. No lakes have moved in or out of this listing category since

the 2012 reporting cycle. It is important to acknowledge that most of the lakes listed in Category 4-A are impaired due to internal phosphorus loading from the sediments. When this is the case, NPS work in a lake's watershed does not result in any noticeable improvement. Properly applied sediment alum treatments can result in a dramatic improvement to the lake water quality. Unfortunately, alum treatments are expensive, far exceeding annual state budgets for lake activities. In recent years, some § 319 funds have been used for 2 alum treatments and another 2 have been funded locally. An in-state, non-lapsing, dedicated fund for lake restoration using alum treatments would allow lake managers to restore additional Category 4-A lakes. Note that for reporting cycles since 2008, Category 4-A also includes all freshwaters in Maine that were listed in previous cycles in a narrative Category 5-C "Impairment caused by atmospheric deposition of mercury" due to the Statewide fish consumption advisory due to mercury. On December 20, 2007, EPA approved a Regional Mercury TMDL which allowed the lakes to be moved to Category 4-A.

Six lakes (48,989 acres) are listed in Category 4-C, lake water impairment not caused by a pollutant. Five of these lakes (48,964 acres) are in non-attainment of aquatic life (habitat) standards due to hydromodification (drawdown). One lake (Otter Pond, 25 acres) was newly included in this Category for the 2022 cycle because of non-attainment of aquatic life (habitat) standards due to historic deposits of sawdust up to 10' thick covering most of its bottom. Sawdust deposits occurred when a sawmill was in operation adjacent to the pond more than a half-century ago. The sawdust has altered, and thus impairs, habitat that would otherwise likely be used by brook trout. The impairment is due to pollution (i.e. 'man-made or man-induced alteration of the … physical … integrity of water, CWA Section 502(19) but not a pollutant), which qualifies it to be listed under 4-C.

Category 5: Lake waters that are impaired or threatened for one or more designated uses by a pollutant(s), TMDL development is required.

Five sub-categories have been designated under Category 5; however, lakes have been listed in only two. Category 5-A includes 2 lakes (1,543 acres), lakes impaired by pollutants and require a TMDL to be conducted by the State of Maine. During this cycle, one lake (Alamoosook Lake, 1,133 acres) was added to this category from Category 2 and one lake (Great Pond, 8,239 acres) was moved into Category 5-Alt, lakes impaired by pollutant that have had a Watershed-based Management Plan prepared that qualifies as an Alternative Restoration Plan as approved by EPA. Category 5-Alt was newly created in the 2018/2020/2022 cycle (see page 46). Table 4- 29 summarizes individual use support for the lakes in Category 5-A. Note that this category includes one 410-acre lake (Cochnewagon) that received an alum treatment in 2019, which resulted in a marked improvement in water quality and may allow the lake to be delisted in the future.

Table 4- 29 Individual Use Support Summary for Lake (acres) in Category 5-A (TMDL Needed)

Designated Use	Non-Attainment	Attainment
Drinking Water Supply (after disinfection/treatment)	0	1,543
Aquatic Life Use Support	1,543	0
Fishing (other than fish consumption covered in Cat. 4-A)	0	1,543
Recreation In / On the Water	1,543	0
Navigation, Hydropower, Agriculture & Industrial Supply	0	1,543

Causes (or Stressors) and Sources resulting in non-attainment are summarized for all impaired waters in Table 4- 15 and Table 4- 20, respectively. Table 4- 16 and Table 4- 21 provide Causes/Sources organized by listing category. For more information on Lake TMDL projects, visit: www.maine.gov/dep/water/monitoring/tmdl .

2022 Assessment Notes. The following five Category 4-A lakes will be considered for delisting in a future cycle. As mentioned above, ***Cochnewagon Lake*** (410 acres) in Monmouth received an alum treatment in 2019, which resulted in a marked improvement in water quality that may allow it to be delisted in the future.

Annabessacook Lake (1,420 acres) in Monmouth is technically meeting the attainment criteria of not blooming in more than half of the 10-year assessment period and could be delisted on that basis. However, discussions with the Cobbossee Watershed District, the primary stakeholder, revealed that they continue to be concerned with the depression of annual transparency means which occurred during the middle of this assessment period, and the slight reversal of improving trend over the last few years. Thus, it was decided to continue tracking improvement to increase confidence in any listing changes.

Lily Pond (29 acres) in Rockport historically had a landfill in its watershed to the north, runoff from which added nutrients to the pond. Drainage from that area, now a transfer station, has been diverted to the wastewater treatment plant. Aldermere Farm in the watershed at the southern end of the lake, has been acquired by the Maine Coast Heritage Trust and although Belted Galloway Cattle are raised on the site, the sustainable agriculture practices that have been implemented, including installation of BMPs to protect the water quality in the pond, have reduced the nutrient input from that operation. In response, the water quality of Lily Pond has improved dramatically, and the lake will be considered for delisting in the next cycle.

Toothaker Pond (30 acres) in Phillips, historically had a sawmill on its shore which resulted in logs and slash in the pond; Meadow Brook was diverted into the pond to provide additional water for the mill. Around 1929, about 20 years after the mill closed, a fish hatchery was built in the Meadow Brook watershed, the effluent from which flowed down the brook to the pond fueling algal blooms. Over the past few decades, DEP has worked with the local lake association to improve water quality in the pond. This included a barley straw application (which did not improve conditions), modification of the Meadow Brook flow regime, and multiple late summer drawdowns to flush phosphorus out of the lake. The success of these drawdowns led the association to build a new dam structure to facilitate this practice. The water quality in Toothaker Pond has improved such that it no longer supports nuisance algal blooms.

East P (1823 acres) in Smithfield was treated with alum in 2018. Water quality has improved dramatically; if this improvement persists, it may be delisted in the next cycle.

Three lakes, on the verge of non-attainment have been restored outside of the regulatory process, the second and third due to alum treatments. ***Clary Lake's*** (666 acres, in Jefferson) water quality had declined following damage to the dam in 2011 by tropical storm Irene. Moving Clary Lake out of Category 2 was not pursued in 2016 because the local lake association was trying to hold the dam owner responsible for the repair. This was unsuccessful so they ended up purchasing the dam and implementing repairs on their own. The pond refilled and water quality has returned to pre-dam damage conditions.

Auburn Lake (2,260 acres) in Auburn, the water supply for the municipalities of Lewiston and Auburn, suffered its first algal bloom in 2012. Severe weather events in 2011 and in early 2012, resulted in huge pulses of nutrients in stormwater runoff from the watershed. One gully on the west side of the lake, was large enough for a tractor trailer to fit in it. A flush of nutrients and iron from upstream wetlands also entered the lake. In September of 2012, the oxygen depletion in hypolimnetic waters resulted in an unusual fish kill. Approximately 200 lake trout (togue) washed up on the shore; fishery biologists estimate that the count was probably closer to 500, as many fish settle to the bottom of lakes during such events. The Auburn Water District sought a permit from DEP to chemically treat the lake should turbidity levels approach the limits of their filtration waver in the future. In 2018, the lake was treated with copper sulfate to knock down algal populations; in 2019 the lake was treated with a low dose of alum to immobilize phosphorus, decrease trophic state and reduce the risk of high turbidity levels.

Georges Pond (380 acres) in Franklin supported its first documented nuisance bloom in 2012. It boomed again in 2015, 2017 and 2018, the 2018 bloom being the most severe and of the longest duration. This mobilized the local lake association to complete their watershed survey and begin fundraising to support an alum treatment. In 2019, data was collected to quantify the phosphorus load being released by the sediments and determine the appropriate dosing concentration. Due to financial constraints, two half-dose, early season treatments occurred in 2020 and 2021. No blooms occurred either year.

Four lakes are being actively worked on in hopes of restoring the water quality; three are listed in Category 4-A and one in Category 2. ***Cross Lake*** (2,515 acres; Category 4A - TMDL completed in 2006) in T17 R05 WELS has had a recent watershed survey completed and intensive water quality monitoring over the last few years. These efforts revealed that little if any internal recycling of phosphorus is occurring and most of phosphorus input is from watershed activities including agriculture, forestry and shoreline development. The department's Watershed Management Unit is working closely with entities to mitigate these inputs.

China Lake (3,845 acres; Category 4A - TMDL completed in 2001) in China, has also had a recent watershed survey completed in addition to intensive water quality monitoring. Results revealed that internal recycling of phosphorus provides a significant contribution to the nutrient load that supports algal blooms in this lake. The northeasternmost section of the lake has been targeted for an alum treatment soon. China Lake serves as the water supply for Kennebec Water District, which supplies drinking water for the municipalities of Waterville, Winslow and Vassalboro.

Togus Pond (660 acres; Category 4A - TMDL completed in 2005) in Augusta recently experienced a few seasons of severe blooms which motivated the lake association to look more closely at sources of phosphorus. A recent watershed survey and intensive water quality monitoring revealed that internal recycling of phosphorus provides a significant contribution to the nutrient load that supports algal blooms in this lake. The association is considering a future alum treatment.

Long Pond (275 acres; Category 2) in Parsonsfield experienced an early fall algal bloom in 2007, from which no data was collected but DEP staff visually confirmed. In 2017 and 2018, the lake bloomed earlier in the year and the blooms persisted for a few months. Preliminary data suggested that internal recycling of phosphorus from the sediments was a contributing factor. A subsequent watershed survey and intensive

monitoring revealed that it was the dominant source. The lake association is looking for funds to support an alum treatment, which is likely to happen before the lake is moved out of Category 2.

VARIOUS TABLES AND ADDITIONAL UPDATES REGARDING MAINE LAKES

CWA § 314 requires a summary of trophic classification for Maine's 'Significant' lakes. This summary is compiled using the numerical criteria in Table 4- 4. Table 4- 30 summarizes the trophic distribution of Maine Lakes.

Table 4- 30 Trophic Status of Maine Lakes

Trophic Category	Significant Lakes		All Lakes	
	Number	Acres	Number	Acres
Dystrophic	2	34	2	34
Eutrophic	593	150,955	670	151,477
Mesotrophic	1,024	664,852	1,127	667,087
Oligotrophic	125	111,500	129	111,547
Total Assessed	**1,744**	**927,341**	**1,928**	**930,145**
Unknown	**569**	**31,636**	**3,852**	**56,807**

Table 4- 31 summarizes techniques used to rehabilitate lakes.

Table 4- 31 Lake Rehabilitation Technique Summary (§ 319 Projects)

Rehabilitation Technique
In-Lake Treatments Alum treatment
Watershed Treatments BMPs associated with Public & Private Road Management BMPs associated with Shoreline Erosion Control / Bank Stabilization
Other Lake Protection/Restoration Techniques Public Information/Education Program/Activities Fish Removal Pilot Project

CWA § 314 also requires reporting Acid Effects on lakes. Maine is fortunate to be located a considerable distance from many of the sources of atmospheric deposition that can result in acidification of surface waters. Some smaller headwater and seepage lakes having naturally low pH are likely slightly more acidic due to such atmospheric inputs but not to levels that have conclusively altered the biota or caused Maine to consider mitigation activities. Recovery from acidic deposition is apparent in lakes in the northeast, including sensitive populations. Regionally, it is estimated that approximately half of the lakes determined to be acidic in the 1980s are now non-acidic (pH >5). In Maine's high-elevation lakes, only four of the 12 lakes found to be acidic in the 1980s were acidic in 2009. An important change in aquatic chemistry coincident with decreased acidic deposition is increased concentrations of dissolved organic carbon (DOC) in recovering surface waters across the northern hemisphere. This result has led to a shift in the source of acidity from inorganic sources (acid deposition), to natural (DOC) sources. Tables 4-28 and 4-29 in the 2010 report estimated numbers and acreages of acidic lakes and sources of acidity (acid deposition and natural sources). These tables have not been included in this report because the estimates are no longer reliable and departmental sampling priorities have not included revisits

to these waters. Although deposition is less acidic now, there have been some legacy effects observed particularly in the DownEast region of Maine manifested as depleted calcium in the watersheds and thus in the receiving waters. This long-term effect is exacerbated by the removal of calcium-rich vegetation during forestry operations. Calcium is an element necessary for many forms of aquatic and terrestrial life.

PROBABILITY-BASED MONITORING

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Participation in EPA National or Regional Probability-based Projects. In addition to the REMAP (Regional Environmental Monitoring and Assessment Program) project of the early 1990s, the DEP Lake Assessment Section participated in an EPA Region 1 probability-based lake monitoring effort in 2006 and the National Lake Assessment (NLA) efforts in 2007, 2012 and 2017. The results of the NLA surveys have helped put the overall condition of Maine lakes in perspective nationally and have add to the State dataset. The NLA reinforced the conclusions that Maine's lightly developed watersheds continue to support lakes in full attainment of most designated uses.

State Cyanotoxin Survey. Using a probability-based approach and a targeted time-series approach, samples were collected for microcystin (MC) analysis from 2014 to present; screening conducted in 2008/2009 revealed that MC was the only detected toxin in samples from blooming lakes. Lakes having a history of algal blooms were targeted with the expectation of gaining worst-case-scenario insights; a summary of these results is included in the latter part of this section.

The probability component included 126 lakes visited from 2014 to 2019. Approximately 22 lakes were randomly selected each year using a stratified random approach. Lakes greater than 150 acres in surface area, located in the more populated areas (approximately 3/5ths of the state) were identified for the probability selection; nearly half of this population was visited. This sampling followed the monitoring protocol established by the Cyanobacteria Monitoring Collaborative spearheaded by EPA Region I. Modifications included running samples having the highest phycocyanin fluorometric results for MC using ELISA and the collection of scum grab samples if algal scums were present.

EPA's 10-day Drinking Water MC health advisory value for 'infants and non-school age children' is 0.3 ppb, and, for 'school-age children and adults' is 1.6 ppb. Their recreational advisory value is 8.0 ppb. Open-water results from the probably-based monitoring suggest that approximately 11% of Maine ***lakes*** having surface areas greater than 150 acres and located in populated regions of the state, had detectable MC in open water when visited; 6.8% exceeded one or more of the EPA advisory values (5% had concentrations between 0.3 – 1.6 ppb, 1.3% had concentrations between 1.6 – 8.0 ppb, and 0.5% exceeded 8.0 ppb). Algal scums were present and were sampled in six of the 126 lakes (4.8%). Of the six, only three had detectable concentrations of microcystin, with one falling between 0.3 – 1.6 ppb and two exceeding 8.0 ppb (9.3 ppb and 491 ppb). It is important to note that higher concentrations derived using ELISA tests may not be as accurate as concentrations closer to the range specified for the kits as the dilution process introduces error into the analysis; nevertheless, one can infer that the actual value is in the same order of magnitude.

On an individual ***sample*** basis, concentrations of MC exceeded EPA's 10-day Drinking Water health advisory value for 'infants and non-school age children' in an average of 6.9% of the open water samples and in three of the six scum samples (2.4% of the lakes sampled). The open water station exceeding these guidelines most often was the downwind near-shore sample. MC concentrations exceeded EPA's 10-day Drinking Water health advisory value for 'school-age children and adults' in an average of 1.8% of the open water samples and in two of the six scum samples (1.6% of the lakes sampled). This is potentially of concern to shorefront property owners that draw their drinking water from the lake, especially those with young children. EPA recreational advisory values were exceeded in an average of 0.5% of the open-water samples and 1.6% of the scum samples.

Time series data was obtained from a total of 487 samples collected from 145 visits to 12 lakes. The sampling regime was identical to that used in the probability study. Lakes known to be chronic severe bloomers were visited frequently to establish 'worst-case-scenario' conditions for the state. Lakes that have bloomed for decades, but not as severely, and lakes that have only recently begun to support blooms were visited less frequently (fewer years). MC concentrations in open-water tended to peak at the end of August and in early September. Concentrations in scum samples tended to peak in mid to late September. By November, many samples yielded concentrations below the reporting level.

Chronic severe bloomers often had concentrations exceeding the drinking water advisory value, and in the case of Sabattus Pond, occasionally exceeding the recreational advisory value. Algal scums often greatly exceeded the recreational advisory value by up to 3-4 orders of magnitude. *Lakes that have bloomed for decades, but not severely* often had MC concentrations that exceeded EPA's drinking water advisory value for infants and small children; algal scums occasionally encountered only exceeded the recreation advisory value slightly. *Lakes that have only recently begun to support occasional blooms,* rarely exceeded EPA advisory values, with the exception of two scum samples which exceeded drinking water advisory values.

State Littoral Study. In 2021, a probability-based approach was implemented to select lakes on which modified PHAB assessments are conducted. The assessments closely follow those included in EPA's NLA program. This study is expected to continue for at least 6 years, a different lake type each year. Data from 2021 is being analyzed currently.

Surface Water Ambient Toxics (SWAT) Monitoring Program

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Related Website: www.maine.gov/dep/water/monitoring/toxics/swat/

For background information on the SWAT monitoring program see the SWAT section under River/Streams on page 83. For the period 2013-20, SWAT monitoring for lakes has focused on mercury trends, mercury in black crappie, PFAS compounds in multiple species of fish, and cyanotoxins produced by harmful algal blooms (HABs). Please refer to the Maine DEP website for individual reports. See Probability Based Monitoring section immediately above for microcystin studies.

Invasive Aquatic Plants

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Related Website: www.maine.gov/dep/water/invasives/

The Maine Legislature passed a dedicated funding mechanism starting in 2002 that established the Department's formal program to control and prevent the spread of invasive aquatic. Fees on Maine-registered motorized watercraft and on out-of-state motorized boats and seaplanes fund state efforts to prevent, detect and manage invasive aquatic species. Eighty percent of this dedicated revenue comes to the Department, twenty percent to the Maine Department of Inland Fisheries and Wildlife (MDIFW). The Department also receives annual funding from the USFWS to support implementation of Maine's Action Plan for Managing Invasive Aquatic Species.

The Department's primary initiatives are spread prevention through voluntary boat inspections, early detection of infestations by trained volunteer surveyors, rapid response to incipient infestations, and management of established infestations. While invasive aquatic plants remain the focus of these efforts, the Department is increasingly expanding spread prevention messages to address all invasive aquatic species. As of early 2022, the Department is working closely with MDIFW and state stakeholders to develop an outreach program to enhance the state's spread prevention efforts for aquatic plants, fish, mollusks and pathogens.

Please visit the program's website www.maine.gov/dep/water/invasives/ for more information on the Department's program to manage invasive aquatic species and see the department's ArcGIS Project for a current map of the of invasive aquatic plant infestations: https://arcg.is/09a4KL.

Estuarine and Marine Waters

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Maine has three classes for the management of estuarine and marine waters: SA, SB, and SC. Classification assignments are based on the minimum level of quality intended for each waterbody. **SA waters** are outstanding natural resources that receive minimal human impact, and are managed for the highest water quality of the three classes. No direct discharges of pollutants, including those from finfish aquaculture, are allowed in SA waters. **SB waters** are general purpose waters that are managed to attain good quality water. Well-treated discharges of pollutants with ample dilution are allowed. **SC waters** are managed for the lowest water quality, but must be fishable and swimmable and maintain the structure and function of the biological community. Well-treated discharges of pollutants are allowed in SC waters. Each class is managed for designated uses and each has DO, bacteria and aquatic life standards (see Table 4-32).

Table 4- 32 Maine's Estuarine and Marine Waters Classification Standards

Class	Designated Uses	Dissolved Oxygen	Bacteria[1]	Aquatic Life
SA	Recreation in and on the water (Primary and Secondary Contact Recreation) Fishing Aquaculture (excludes finfish) Propagation and harvesting of shellfish Navigation Habitat for fish and estuarine and marine life	As naturally occurs	As naturally occurs but *Enterococcus* may not exceed geometric mean of 8 CFU/100 mL in any 90-day interval or 54 CFU/100 mL in more than 10% of samples in any 90-day interval	As naturally occurs
SB	Recreation in and on the water (Primary and Secondary Contact Recreation) Fishing Aquaculture Propagation and harvesting of shellfish Industrial process and cooling water supply Hydroelectric power generation Navigation Habitat for fish and estuarine and marine life	Not less than 85% of saturation	*Enterococcus* may not exceed geometric mean of 8 CFU/100 mL in any 90-day interval or 54 CFU/100 mL in more than 10% of samples (STV) in any 90-day interval from 4/15 to 10/31. Not to exceed criteria of National Shellfish Sanitation Program for shellfish harvesting	Support all indigenous estuarine and marine species Discharge not to cause closure of shellfish beds
SC	Recreation in and on the water (Primary and Secondary Contact Recreation) Fishing Aquaculture Propagation and restricted harvesting of shellfish Industrial process and cooling water supply Hydroelectric power generation Navigation Habitat for fish and estuarine and marine life	Not less than 70% of saturation	*Enterococcus* may not exceed geometric mean of 14 CFU/100 mL in any 90-day interval or 94 CFU/100 mL in more than 10% of samples (STV) in any 90-day interval from 4/15 to 10/31. Not to exceed criteria of National Shellfish Sanitation Program for restricted shellfish harvesting.	Maintain structure and function of the resident biological community Support all indigenous fish species

[1] Table 4.3 includes reference to federal bacteria criteria.

Maine law requires that once every three years, the Department review the classification system and related standards and make recommendations to the BEP for any needed changes in the water quality classifications assigned to specific waterbodies. For more information please see pages 27-28. No changes were made to marine classifications during the current assessment period. The present distribution of waters assigned to three marine water quality classes is summarized in Table 4- 33.

Table 4- 33 Area and Percentage of Estuarine and Marine Waters in Each Classification

Class	Square Miles	Percentage
SA	283	10
SB	2,578	89
SC	28	1
Total	**2,889**	**100**

This chapter provides an assessment of the degree to which water quality supports the designated uses defined by the State of Maine statutes for the protection of aquatic life. Designated uses in this chapter and in Chapter 7 (Public Health-Related Assessments)

are divided into two broad use categories: protection of human health and protection of aquatic life. The protection of these uses will result in the protection of other uses (e.g. navigation, industrial process and cooling supply). Applicable monitoring results and attainment assessments are summarized within each of these two categories in this chapter as well as in Chapter 7.

Summary of Statewide Status

This Integrated Report requires the assignment of each assessment unit (AU) into one of five categories (see Chapter 4). Specific segments of waterbodies are determined to be impaired if they do not attain, or are suspected not to attain, one or more of the uses assigned by their classification based on the standards for that classification or other criteria. As with any assessment of this kind, the identification of impaired waters cannot be considered complete but rather is a reflection of the findings (to date) relative to the level of effort expended by the agency and its partners and other cooperating contributors.

Estuarine and marine waters category assignments have previously been expressed per "DEP Waterbody ID", a segmentation method that was associated with a general description of geographic extent but without an accurate delineation by GIS layer. For those categories comprised of waters assessed for the shellfish harvest use, the "DEP Waterbody ID" was accompanied by a "DMR Pollution Area" that coincided with the shellfish harvest area classified by the Maine Department of Marine Resources (DMR) based on National Shellfish Sanitation Program (NSSP) guidance.

For this 2022 report, estuarine and marine AUs have been developed to better align assessment area notation with Maine's freshwater segments, and to allow accurate georeferencing. There are two sets of new AUs that are comprised of HUC12 units followed by waterbody class, a unique identifier, and then "E" to signify estuarine/marine segments.

1) AUs for the **shellfish harvest designated use** are configured in two ways:
   a) For those waters actively managed by the DMR for shellfish harvest, AUs include a unique identifier that is specific to the Growing Area assignment and classification (e.g. "_WK_PE", where "WK" identifies the Growing Area and "P" the Prohibited classification). Classification types include "P" for Prohibited, "R" for Restricted, "CR" for Conditionally Restricted, "CA" for Conditionally Approved, or "A" for Approved. Where the DMR has created multiple Growing Area Sections within a single Growing Area (e.g. P1, P2, P5), the Growing Area Sections have been grouped into a single AU that exists within a HUC12 area and waterbody class. Assessment comments provided in Appendix V list the Growing Area Sections that are included within each AU. Based on the above description, an example of an AU for shellfish harvest designated use is "ME010600010402_SC_WI_PE".
   b) For those waters impaired by Combined Sewer Overflow (CSO) points due to fecal contamination, AUs similarly include a HUC12 unit followed by waterbody class that is then immediately followed by a unique numeric identifier and then the "E" for estuarine/marine segments (ex. "ME010600010402_SC1_E".)
2) AUs for **non-shellfish harvest (all other) designated uses** are structured as follows:
   a) For impaired waters, following the HUC12 unit and waterbody class, a unique identifier is assigned sequentially from north/west to south/east followed by an 'E' to indicate estuarine/marine waters (ex. "_01E" or "_01B" for the

northern/westernmost AU). An example of an AU for non-shellfish harvest use (all other) in estuarine/marine waters is "ME010600010402_SC_01E".)

b) For estuarine/marine waters meeting at least one designated use other than shellfish harvesting, the AU is identical to the impaired waters convention but is lacking the unique numerical identifier (ex. "ME010600010402_SC_E").

The establishment of two sets of estuarine and marine AUs improves adaptability for the more dynamic classification revisions conducted by the DMR on an annual basis (for the shellfish harvest designated use) while allowing greater stability for areas with less frequent changes (all other designated uses). The two sets of AUs will be presented separately within Integrated Report Appendix V: Estuarine and Marine Waters, and two GIS layers will enable separate and overlaid viewing for the two sets of AUs, as well as facilitate visualization of spatial alterations to a single segment of an AU from one reporting cycle to another. Additionally, a crosswalk table that approximates the location of the old Waterbody IDs within the new AUs will be linked from the Department's website where 305(b) reports and 303(d) lists are available: https://www.maine.gov/dep/water/monitoring/305b/index.html.

Assessment unit IDs for the designated use of recreation in the water (i.e. Primary Contact Recreation) at coastal designated beaches participating in the Maine Healthy Beaches Program consist of the 12-digit HUC followed by the EPA Beach ID assigned to each Beach Management Area followed by 'B' to indicate a beach (ex. "ME010600031001_SB_286041B" for Fort Foster - Pier Beach (Kittery)).

An overall use attainment summary for estuarine and marine waters, including coastal designated beaches, for 2022 is provided below and in Table 4- 9.

Category 1: Estuarine and marine waters attaining all designated uses and water quality standards, and no use is threatened.

No changes were made to Category 1 as part of this 2022 assessment. No waters are assigned to this Category.

Category 2: Estuarine and marine waters attaining some of the designated uses; no use is threatened; and insufficient data or no data and information is available to determine if the remaining uses are attained or threatened (with presumption that all uses are attained).

For the 2022 assessment, two sets of segments were included: one for the shellfish harvest designated use and one for all other designated uses. Fifty-seven coastal designated beaches were included in this category for the first time in this cycle.

Category 3: Estuarine and marine waters with insufficient data and information to determine if designated uses are attained (with presumption that one or more uses may be impaired).

The transition to AUs from Waterbody IDs/DMR Pollution Areas for shellfish harvest designated use segments resulted in the restructuring of Categories 3 and 5-B-1 such that most listings in 2016 report Categories 5-B-1(a), 5-B-1(b) and 5-B-1(c) have either been delisted to Category 3 (if insufficient data or not assessed) or remain in the now combined Category 5-B-1 (if sufficient data exist). See also the detailed listing methodology in section Data Interpretation: Shellfish Propagation and Harvest. Based on this transition, Category 3 shellfish harvest designated use waters increased substantially in number (to 122 AUs). No changes were made to Category 3 segments

for non-shellfish harvesting designated uses. Five coastal designated beaches were included in this category for the first time in this cycle.

Category 4: Estuarine and marine waters that are impaired or threatened for one or more designated uses, but do not require development of a TMDL.

For this 2022 report, 2016 report Categories 4-A(a) and 4-A(b) were combined as simply Category 4-A. 2016 report Category 4-B-1 is now Category 4-B. The 2022 assessment included Category 4-A updates to the Salmon Falls/Piscataqua River Estuary dissolved oxygen impairment based on discrete monitoring data, and to the 14 CSO-impaired segments to account for new master plans and reductions in quantity of discharge points. No changes were made to Category 4-B segments. The Category 4-C New Meadows River Estuary segment was assessed based on new data, without a resulting change to this listing. No coastal designated beaches are included in any Category 4.

Category 5: Estuarine and marine waters that are impaired or threatened for one or more designated uses by a pollutant(s) and a TMDL is required.

The 2022 assessment updated the Category 5-A listings to account for new discrete and continuous data from the Royal River Estuary and Mousam River, and new eelgrass extent information in the Piscataqua River and Portsmouth Harbor. See the comment for Category 3 above regarding the transition to AUs from Waterbody IDs/DMR Pollution Areas. Category 5-B-1 listings are comprehensive for shellfish harvest closures based on DMR monitoring data as of 3/1/2021. The identification of which 5-B-1 listings are currently covered by the 2009 Statewide Bacteria TMDL will occur for the 2024 assessment cycle if this TMDL cannot be revised in time to enable delisting of the Category 5-B-1 segments to Category 4-A. Category 5-D is unchanged for this 2022 assessment.

Water quality data for coastal designated beaches were evaluated for the first time as part of this 2018-2022 assessment. Three beaches were listed in Category 5-B, including Goose Rocks Beach - Batson River and Goose Rocks Beach - Little River in Kennebunkport and Riverside Beach in Ogunquit. For more information for Category 5-B designated beaches listings, see ‘Causes and Sources of Impairment in Categories 4 and 5, Bacteria’, page 100.

Causes and Sources of Impairment in Categories 4 and 5

Cause and stressor type information is provided in Table 4- 18, while information on sources of impairment is provided in Table 4- 18. Causes include impairments due to elevated toxics concentrations, elevated bacterial counts (fecal contamination with *Enterococcus* or fecal coliforms as the indicator organism or group of organisms, respectively), low dissolved oxygen, elevated nutrients and/or biological indicators of eutrophication, or tidal flow alteration. These causes are presented below in greater detail.

TOXICS

After bacteria, the general category of toxics is by far the next most widespread cause of impairment in marine waters in the State. The toxics subcategories of Polychlorinated Biphenyls (PCBs), dioxins and/or mercury impaired 2,890 square miles (1,849,696 acres) of marine waters due to the statewide marine consumption

advisories for lobster tomalley and certain saltwater finfish. Industrial point sources have historically been the largest contributing source category for dioxin. Some industrial loads that are treated through municipal point sources are additional sources although pretreatment is required in most cases. These industrial sources account for most of the shellfish and finfish consumption listed waters where dioxins remain the primary contaminant. Due to changes in bleaching at the state's bleached kraft pulp and paper mills, as of 2005 the mills were found to be no longer discharging measurable amounts of dioxin. As a result, concentrations in fish are declining, although elevated levels remain in fish in some estuarine portions of rivers due to historical discharges.

The removal of CSOs over the past several years has improved environmental quality in some of Maine's harbors. However, many locations, for example Kittery, Portland, Boothbay Harbor, Rockland and Searsport, have lingering toxic pollution problems resulting from past activities. These activities include papermaking, shipbuilding, energy production (e.g. gasworks), tanning, and metal working. Toxics derived from these industries include dioxin, pesticides such as DDT, metals, and PCBs. Landfills were also often located on the coast (e.g. Eastern Promenade in Portland) and continue to be sources of toxic pollutants. More recent elevations in toxic pollution, especially from Polycyclic Aromatic Hydrocarbons (PAHs) and metals (e.g. lead, copper, zinc), are related to increases in urban development and boat-related activities. Direct untreated discharges through CSOs still deliver toxic pollutants and bacteria to Maine's coastal waters during and after storms. Some toxic pollutants (e.g. PAHs, mercury) are deposited from the air.

Even more recently, human health concerns due to the environmental presence of Per- and Polyfluoroalkyl Substances (PFAS) have been raised. PFAS have been widely used in household products, industrial settings, and firefighting foams due to their ability to repel oil, grease, water and heat. PFAS break down very slowly and are therefore persistent in the environment. Health agencies are working to understand more about the human health effects of low level, long-term exposure. The Department is engaged in monitoring surface and ground waters to detect concentrations of PFAS in water, sediment and tissue. In January 2020, the Maine PFAS Task Force produced "Managing PFAS in Maine, Final Report from the Maine PFAS Task Force".

BACTERIA

The intent of the Maine Statewide Bacteria Total Maximum Daily Load (TMDL) was to "support action to reduce public health risk from waterborne disease-causing organisms." Non-pathogenic bacteria, including enterococci in the marine environment, are used as indicator organisms for fecal pathogens in water. Waterborne pathogens (bacteria, viruses, etc.) enter surface waters from a variety of sources, including human sewage and the feces of warm-blooded wildlife. These pathogens can pose a risk to human health due to gastrointestinal illness through different exposure routes, including contact with and ingestion of recreational waters, ingestion of drinking water, and consumption of filter-feeding shellfish (clams, mussels, etc.). Additionally, the TMDL was intended to identify waterbody segments that were not meeting attainment of the designated uses of swimming and shellfishing based on associated water quality criteria.

Implementation of the approved 2009 Statewide Bacteria TMDL is intended to result in improved management of bacterial sources of impairment that cause shellfish closures. For the 2016 list, the acreage for all estuarine and marine waters impaired due to

shellfish harvest closures as of 2014 was 267,935 acres (419 square miles). For the 2022 reporting cycle, the total area closed to shellfish harvest based on sufficient data is 37 square miles. As indicated in Data Interpretation: Shellfish Propagation and Harvest and in Summary of Statewide Status, considerable area (356 square miles) has been delisted from Category 5-B-1 to Category 3 for this cycle to account for harvesting closures made administratively, or without sufficient data.

While DMR utilizes fecal coliform bacteria to determine appropriate shellfish harvest closures (see also Chapter 7), bacterial monitoring using enterococci as indicator organisms is conducted by the Department in selected urban streams, and the Maine Healthy Beaches program on coastal designated beaches and occasionally in tidal waters that influence bacterial loads to recreational areas. All monitoring programs aid in the identification of fecal contamination from point and nonpoint sources, for example through local knowledge, Department permits, and applied techniques such as Microbial Source Tracking.

Beaches are listed as impaired for the first time in the current cycle as explained in 'Coastal, Marine Beach Recreational Water Quality Monitoring', below (page 99). For the current cycle, three designated beaches were added in Category 5-B. These beaches include Goose Rocks Beach - Batson River and Goose Rocks Beach - Little River in Kennebunkport and Riverside Beach in Ogunquit. While most of Maine's designated beaches experience very few or no bacteria exceedances for the majority of the monitoring season, there are instances when elevated bacteria levels may jeopardize public health, particularly at the three beaches listed above. MHB's historical data demonstrates a relationship between antecedent precipitation and observed bacteria exceedances at these impaired beaches. This suggests that nonpoint source pollution likely contributed to these impaired listings, as each of the three listed beaches is located in close proximity to river mouths. As a result, bacteria are transported from upland areas during all weather conditions, but especially when it rains. This contributes to increased fecal indicator bacteria (FIB) loading at these beaches, resulting in exceedances of Maine's enterococci bacteria safety threshold and subsequent public health advisory recommendations.

Many Maine towns with a history of elevated fecal bacteria at beaches have undertaken efforts in the surrounding watersheds to identify possible sources of fecal bacteria to support the prioritization of local investigative and remediation efforts. Specifically, the towns of Kennebunkport and Ogunquit have demonstrated a clear commitment to improving beach water quality by investigating, identifying, and removing sources of human wastewater discharges (i.e. those from private septic systems and municipal sewer), assessing wastewater and stormwater infrastructure, and expanding local public education and outreach initiatives in addition to conducting enhanced water quality monitoring studies. Such information can help in addressing the problems that resulted in a Category 5-B listing based on the existing listing methodology (pages 59-60).

DISSOLVED OXYGEN

Seven waterbody segments are listed as impaired (one in Category 4-A, four in Category 4-B, and two in Category 5-A) due to lack of attainment of dissolved oxygen (DO) criteria. The reasons for non-attainment are varied and include loadings from point and nonpoint sources in waterbody segments with insufficient flow, and factors such as benthic respiration (sediment oxygen demand). No revisions were made to any of the segments described below in this report.

1) The estuarine portion of the lower Salmon Falls/upper Piscataqua River has a completed TMDL; however, implementation in ME and NH is incomplete. Contractor FB Environmental collected sonde profiles and completed grab sampling during low river flow in July-September 2013-2020 at three estuarine sites. Data demonstrated regular, early morning DO non-attainment (<85% saturation) more pronounced with greater water column depth. Moderate to high chlorophyll *a* and elevated total nitrogen concentrations reveal considerable biological productivity and continued eutrophic conditions.
2) The estuarine portions of the St. George and Medomak Rivers are not known to have been monitored for DO under an approved Quality Assurance Project Plan (QAPP) since the 2012 reporting cycle, so no additional information on attainment is available since relocation of municipal point sources. The Department anticipates working with the Maine Coastal Observing Alliance (MCOA) during the next reporting cycle to oversee completion of a QAPP that covers water quality monitoring in the St. George River estuary as well as several other Midcoast estuaries.
3) Considerable water quality sampling efforts have occurred in the Ogunquit River and Goosefare Brook areas as part of watershed-based plan implementation; however, monitoring goals only minimally overlapped with the Category 4-B listed areas. The Ogunquit River segment was monitored discretely at one location during 2016, though sample size was insufficient to permit an evaluation for DO attainment. In Goosefare Brook, one site overlapped with the impaired area and did not provide sufficient data to assess DO attainment. An additional site in a tributary adjacent to the Old Orchard wastewater treatment facility and immediately upstream of the impaired Brook area demonstrated frequency and magnitude exceedances of the DO criterion and revealed diurnal swings on greater than 10% of monitored dates and over consecutive days.
4) The draft Royal River Waste Load Allocation Study, dated March 2006, recommended delisting the estuary for DO due to potential natural causes. For this reason, the Royal River listing was removed from TMDL Vision during the current cycle, and delisting may be sought in a subsequent cycle. An update to the listing comments in this 2022 cycle indicates that non-attainment was again measured during continuous monitoring in 2017, and included duration, frequency, and magnitude exceedances in the upper estuary, in addition to repeated diurnal swings >2.5 mg/L.
5) The draft Mousam River Waste Load Allocation Study, dated February 2005, indicated that the majority of oxygen loss is due to benthic respiration and circulation factors and that the Kennebunk treatment facility has only a very marginal effect. Due to these suspected natural causes of non-attainment, the Mousam River listing was removed from TMDL Vision during the current cycle. An update to the listing comments notes that data collection continued in 2013 and 2015 and confirmed DO non-attainment. During 2015, both the upper and lower portions of the estuary demonstrated duration exceedances of the DO criterion and diurnal swings of >2.5 mg/L on 27%-64% of days during the monitoring period. No continuous data were available from the mid-estuary within the current assessment cycle. Additional monitoring is planned for summers of 2021 and 2022 to assess conditions along the estuarine gradient.

Generally, data from various studies and volunteer monitoring programs show DO levels along the coast to be adequate to protect marine life. While some estuaries have

DO levels that do not consistently meet their classification criteria, the Department has concluded that some of these instances are a result of natural processes including bacterial respiration within the benthic boundary layer. Further, larger data sets enabled by recently established, unattended monitoring sites as well as a somewhat greater availability of monitoring data from deeper embayments and channels are improving knowledge of DO values below the pycnocline during times of natural, vertical stratification.

NUTRIENT/EUTROPHICATION BIOLOGICAL INDICATORS

Along the Maine coast there are instances of elevated nutrient conditions and in some cases, corresponding biological responses. From Bar Harbor to Eastport, the principal nutrient sources are naturally occurring organic loads from rivers and streams, atmospheric deposition, and flood tide contributions from the Gulf of Maine. More developed areas of the Maine coastline along Penobscot Bay, Casco Bay and the southern rivers and streams experience eutrophication from freshwater inflows carrying treated and occasionally untreated wastewater, stormwater runoff, and groundwater in areas with sandy soils. While nitrogen is consistently conveyed through water, atmospheric deposition can be a dominant nitrogen source in more rural areas of Maine.

Typical biological indicators of nutrient enrichment effects within Maine's marine waters include primary producers like phytoplankton, macroalgae, and eelgrass (*Zostera marina*) and its algal epiphytes. Phytoplankton blooms are more often observed in tidal waters with ample nutrient supply and light availability, and less turbulent water leading to reduced vertical mixing. While spring, summer and fall blooms of nuisance phytoplankton (e.g. diatoms and dinoflagellates) have been shown to coincide with increased availability of inorganic water column nutrients, a 2010 report prepared for the Casco Bay Estuary Partnership concluded that based on 2006-2008 data, bloom intensity of the toxic red tide organism, *Alexandrium spp.*, in Casco Bay did not correlate with anthropogenic, land-derived nutrient loading. Within the assessment period of this report, the DMR has noted increasing bloom frequency of a more southern species of harmful phytoplankton, *Karenia mikimotoi*, as well as diatom species within the genus *Pseudo-nitzschia*. Whether growth enrichment of individuals of these species occurs from land-derived nutrients along the Maine coast is unclear.

Similar to phytoplankton, proliferation of opportunistic macroalgae generally occurs when favorable temperature, irradiance and nutrient availability coincide. Anthropogenic nitrogen has been shown to fuel growth of nuisance macroalgae on the benthic surface, particularly of the genus *Ulva*. While nuisance macroalgal growth typically occurs on protected shorelines with shallow slopes such as mudflats, excessive growth can also be observed along more exposed shorelines and within vertical structure provided by eelgrass. Opportunistic macroalgal growth is a natural occurrence, although widespread and dense blooms covering intertidal and shallow subtidal shorelines can smother organisms living in the sediment and result in production of toxic concentrations of hydrogen sulfide by bacteria.

The success of eelgrass is strongly influenced by light availability, which can be limited by accumulations of epiphytes (diatoms, macroalgae, tunicates, bryozoans, hydroids, e.g.) or elevated water column turbidity and/or dissolved organic matter. Confounding interpretations of eutrophication effects, eelgrass epiphyte abundance can be controlled seasonally by grazing pressure from marine invertebrates such as snails and small crustaceans. Broad geographic mapping surveys along the Maine coast were

completed by DMR in the 1990s and 2000s, but knowledge of eelgrass distribution since that time is available only for the Southern Maine region from the New Hampshire border in Kittery through eastern Casco Bay in Phippsburg. Use of eelgrass as an indicator of eutrophication has occurred most notably in the Great Bay estuary in New Hampshire as well as embayments surrounding Cape Cod, Massachusetts where wastewater and nonpoint source nitrogen contributions have been implicated in eelgrass losses. Within Maine, monitoring of eelgrass health metrics has occurred intermittently since 2017 within Casco Bay. Efforts by the Department and partners in the coming years will increase knowledge of eutrophication impacts on this essential habitat.

As of this 2022 report, one waterbody segment is listed as impaired based on a cause of nutrient/eutrophication biological indicators. The State of New Hampshire listed the Piscataqua River Estuary (Lower Piscataqua River, NH Assessment Units NHEST600031001-02-01 and NHEST600031001-02-02) and Upper Portsmouth Harbor, NH Assessment Unit NHEST600031001-11, on its 2010 303(d) list for Aquatic Life impairment due to >20% loss of eelgrass. For the 2012 reporting cycle, the Department determined that eelgrass within the Piscataqua River AUs ME010600031001_SB_01E and ME010600031001_SC_01E (formerly Waterbody ID 812-2) had declined from 299.1 acres to 6.8 acres (98% loss) from 1996 to 2010, and that sufficient data existed to assign a Category 5 listing for a Marine Life Use Support impairment with cause of "nutrient/eutrophication biological indicators". The Department also added the adjacent Portsmouth Harbor segment, ME010600031001_SB_02E (formerly Waterbody ID 812-3) to the 2012 impaired list based on a 49% decrease between 1996 and 2010. A cause 'unknown' designation was assigned to ME010600031001_SB_02E (then Waterbody ID 812-3) until further data collection and analyses could be completed to investigate potential reasons for decline. The impairment listings and causes for both Maine segments were carried over in the 2014 and 2016 reports due to continued declines in eelgrass areal extent and insufficient data to change causes for these declines.

For the current reporting cycle, the Department assessed eelgrass distribution data generated by the Piscataqua Region Estuaries Partnership (PREP) during aerial and groundtruthing surveys in 2015, 2016, 2017 and 2019. Since last assessed for the 2016 cycle, eelgrass area within the Piscataqua River segment has doubled from 7.23 acres to 14.53 acres. This modest areal increase coincides with documentation from Barker (2020) and Burdick *et al*. (2020) that by 2019, eelgrass in the Great Bay estuary including the Piscataqua River segment was growing taller and denser. From 2012 to 2020, a point source nitrogen load decline approximating 70% may be improving water quality that facilitates natural reestablishment of eelgrass in downstream areas.

Similar increases in eelgrass distribution have not been observed within the Portsmouth Harbor segment, where extent remained generally constant between 113 and 126 acres between 2015 and 2019. Whether a recent upgrade to tertiary treatment at the Portsmouth wastewater treatment plant on Peirce Island will enable natural restoration of eelgrass in the Portsmouth Harbor segment will be determined based on future aerial surveys conducted in this region, including a survey completed during 2021. Future attainment evaluations will also be informed by the continued monitoring of a seagrass site established by the PREP in 2019 adjacent to the Fort Foster shoreline.

TIDAL FLOW ALTERATION

Tidal flow restrictions are inevitabilities of historic transportation projects designed to permit automobile traffic over marine waters via constructed causeways. Due to these restrictions, natural tidal flow is diminished when flood tides are not permitted to regularly fill upper portions of estuaries, resulting in longer flushing times and increased water column stratification, often as a detriment to water chemistry and the resident biological community. The presence of the tidal restrictions provides suitable conditions for surface water phytoplankton proliferation and enables benthic respiration to deprive bottom water of oxygen. For the 2022 report, one waterbody segment is listed as impaired based on the cause of tidal flow alteration.

The New Meadows River, including the "Lake" upstream of Howard Point is listed in Category 4-C due to tidal restrictions created by the installation of causeways in 1937 and the 1960s. While previously listed in this category as impaired for Marine Life Use Support based on low dissolved oxygen (DO) conditions, the presence of three tidal restrictions, most notably at the seaward extent of the "Lake" at the Bath Rd./State Rd. crossing, was documented in the 2014 report as the underlying cause for impairment. This restricted flow has resulted in persistently elevated nutrient concentrations, moderate chlorophyll concentrations and low water column transparencies (although based on limited sample size), observations of surface water organic matter, and low DO concentrations.

Data used to support continued inclusion of this segment in Category 4-C were collected by the Friends of Casco Bay from 2015-2017 at the head of the "Lake" and from 2015-2020 at the New Meadows Marina just seaward of the Bath Rd./State Rd. tidal restriction. The site at the head of the "Lake" demonstrated consistent DO non-attainment during morning sampling events, with non-attaining values averaging 65% saturation. Afternoon DO monitoring continued to show large diel differences as compared to morning values, and observations of turbid water, organic surface films, and green macroalgae along the shoreline were common. The New Meadows Marina site presented a smaller magnitude of DO extremes, and turbidity measured during 2019 and 2020 did not exceed 5 FNU. Of non-attaining DO values, the average was slightly higher than the "Lake" site at 72% saturation over the period of record. These available data illustrate the sustained tidal flow alteration impact on DO both within the "Lake" as well as just below the outflow.

Surface Water Ambient Toxics (SWAT) Monitoring Program

Contact: Jim Stahlnecker, DEP, BWQ, DEA

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Related Website: www.maine.gov/dep/water/monitoring/toxics/swat/

For background information on the SWAT monitoring program see the SWAT section under River/Streams on page 83). For the period 2013-2018, SWAT monitoring for the marine module has focused on dioxins, mercury and other heavy metals, PCBs, PAHs, and PFAS in American lobster, blue mussels and softshell clams at suspected contaminated sites and other sites of interest to DEP and the Maine Department of Marine Resources. In 2019-20, blue mussel tissue from numerous additional sites was analyzed for PFAS and sub-adult American eel tissue from two rivers was analyzed for mercury. Please refer to the website for individual reports on this subject.

Coastal and Ocean Acidification

Coastal and ocean acidification observed as consequences of local, land-based alterations to estuarine water quality and rising atmospheric CO_2 is a topic of mounting concern worldwide. For the 2008, 2010 and 2012 Integrated Reports, the Center for Biological Diversity (CBD) in San Francisco, CA requested that coastal states list their coastal waters as threatened or impaired, in Category 5, due to information that has been gathered indicating marine ecosystems may already be experiencing declines in ocean pH. As one of the conditions of a settlement agreement with the CBD, the EPA issued a memorandum on November 15, 2010, describing how states could move forward, where ocean acidification (OA) information exists, in order to address OA during the 2012 listing cycle using the current 303(d) Integrated Reporting framework. This memorandum also acknowledged that in the case of OA, information is largely absent or limited at this point in time to support the listing of waters for OA in many states. The following EPA webpage includes a copy of the signed memorandum, "Integrated Reporting and Listing Decisions Related to Ocean Acidification": www.epa.gov/tmdl/epa-issues-november-15-2010-memorandum-integrated-reporting-and-listing-decisions-related-ocean .

In the 2014 and 2016 reporting cycles, the Department acknowledged that OA and its effects on pH and marine life have been documented in other areas of the world's estuarine and coastal waters and may be of concern in Maine's marine waters. While the Department had not established a monitoring program specifically targeted at identifying OA and its effects on water quality criteria and designated uses, Department staff had been in contact with environmental organizations and universities whose researchers were conducting focused studies on pH and effects on shellfisheries within Maine jurisdictional waters.

For this 2022 report, Department staff continue to track monitoring efforts within Maine estuarine/marine waters, which have expanded to include continuous and discrete monitoring of OA parameters at several offshore buoy and inshore fixed locations. Some of these data are available at https://mariners.neracoos.org/ and http://maine.loboviz.com/. Notably, the Casco Bay Estuary Partnership sponsored a monitoring station in South Portland maintained by the University of New Hampshire, that has allowed visualization of variability of pH and pCO_2 at multiple scales of assessment, from the duration of a single tide to interannual changes. As of the end of 2020, the Friends of Casco Bay were maintaining one continuous monitoring site and calculating omega aragonite values based on pH and pCO_2 data, and have since added two more sites in 2021: www.cascobay.org/our-work/science/continuous-monitoring-stations/. The Wells National Estuarine Research Reserve (NERR) and Maine Department of Marine Resources (DMR) each added OA parameter monitoring at one long term monitoring site each in 2021.

Each of these monitoring efforts improve the ability to detect the magnitude and frequency of pH and pCO_2 concentrations and assess the duration of potentially stressful events for marine life. Simultaneously, academic institutions and environmental organizations within and beyond Maine's borders are studying impacts of coastal and ocean acidification on indicator organisms relevant to Maine's shellfish propagation and aquatic life designated uses. As more data become available in subsequent reporting cycles, the degree to which attainment can be addressed will improve. As of this 2022 report, the Department is not listing any estuarine/marine waters as impaired due to a cause of coastal or ocean acidification due to insufficient

information that would indicate exceedance of water quality criteria or lack of attainment of designated uses.

Coastal, Marine Beach Recreational Water Quality Monitoring

Contacts: Meagan Sims, Maine Healthy Beaches (MHB) Program Coordinator, DEP, BWQ, DEA

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Tracy Krueger, MHB Program Data and Technical Manager, DEP, BWQ, DEA

Tel: (207) 446-1003 email: tracy.krueger@maine.gov

Related Website: mainehealthybeaches.org

Assessment results based on bacteria monitoring at designated marine beaches are included for the first time in this Integrated Report based on a requirement in the 2014 National Beach Guidance and Required Performance Criteria for Grants, which states that beach water quality monitoring data must be used for listing of impaired waters once a state has adopted EPA's 2012 Recreational Water Quality Criteria (RWQC). In 2018, Maine updated its existing bacteria criteria based in part on the 2012 RWQC and is, therefore, listing beaches for the first time in this report cycle.

The Maine Healthy Beaches (MHB) Program is the primary source of coastal, marine beach water quality data in the State of Maine. The MHB Program and its partners implement monitoring, assessment, and notification of water quality conditions at participating beaches. The Program monitors for levels of *Enterococcus* bacteria under an EPA-approved QAPP. More information on the Program is available at the MHB website linked above and on pages 127-131.

The MHB program uses a safety threshold or Beach Action Value (BAV) of 104 Most Probable Number (MPN[14]) of *Enterococcus* bacteria per 100 mL that was approved by the EPA in 2016. The BAV is used to trigger recommended beach water quality notifications ('contamination advisories'). For designated coastal beach assessments, exceedance of this BAV is used to determine impairment status. Details of the assessment and listing methodology are provided above under 'Data Interpretation, Bacteria' (pages 57-60) and impaired beach listings are included above under 'Causes and Sources of Impairment in Categories 4 and 5', 'Bacteria' (page 100).

[14] MPN is equivalent to CFU.

CHAPTER 5 WETLANDS

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Related Websites: www.maine.gov/dep/water/wetlands/ and

www.maine.gov/dep/water/monitoring/biomonitoring/index.html

BACKGROUND

Federal Regulation

EPA Contact: Beth Alafat, EPA Region I, Office of Ecosystem Protection

Tel: (617) 918-1399 email: Alafat.Beth@epa.gov

Related Website: (EPA) water.epa.gov/type/wetlands/

ACE Contact: Taylor Bell, Mitigation Program Manager ACE New England Region, Regulatory Division

Work - (978) 318-8952 Cell - (978) 856-5598 email: Taylor.m.bell@usace.army.mil

Related Website: (ACE)

www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx

Lead Agencies: EPA Region I and the U.S. Army Corps of Engineers (ACE) – Maine Project Office

The Clean Water Act provides for wetland protection and regulation through a number of federal programs, most of which are administered by EPA. The § 404 regulatory program is jointly administered by EPA and the U.S. Army Corps of Engineers. Key elements of the federal wetland protection framework are described in more detail in the Chapter 5 of Maine's 2006 Water Quality Assessment.

Wetlands Regulatory Program in Maine's Organized Towns

Contact: Nick Livesay, DEP, Bureau of Land Resources (BLR)

Tel: (207) 530-0965 email: Nick.Livesay@maine.gov

Related Website: (NRPA) www.maine.gov/dep/land/nrpa/

Maine DEP regulates wetland alterations in the organized townships under the Natural Resources Protection Act 38 M.R.S. §§ 480-A et seq. (NRPA) and Wetlands and Waterbodies Protection Rules, *06-096 C.M.R. ch. 310* (effective date November 11, 2018). Additional information on the DEP wetlands regulatory program is available at the above web site.

Wetlands Regulatory Program in Unorganized Territories

Contact: Maine Land Use Planning Commission (LUPC), Department of Agriculture, Conservation and Forestry (DACF)

Website: www.maine.gov/dacf/lupc/

Staff directory: www.maine.gov/dacf/lupc/about/staff/index.shtml

The Maine Land Use Planning Commission (LUPC) uses a land use planning approach to regulate wetlands in unorganized portions of the State, in accordance with the provisions of Title 12, §§681-689 (Use Regulation) and Chapter 10 rules (Land Use Districts and Standards). Details about the LUPC statute and rules may be found at www.maine.gov/dacf/lupc/laws_rules/index.shtml.

DEVELOPMENT OF WETLAND WATER QUALITY STANDARDS

Contact: Jeanne DiFranco, DEP, BWQ, DEA

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Related websites: EPA (Wetland Water Quality) www.epa.gov/wetlands/wetland-water-quality-standards and EPA (General Water Quality Standards) www.epa.gov/wqs-tech

Maine Water Classification Program: www.maine.gov/dep/water/monitoring/classification/index.html

Maine's Water Classification Program

Wetlands are included in the definition of "Waters of the State" set forth in the Protection and Improvement of Waters Act, 38 M.R.S. § 361-A, and are further defined as either "fresh surface waters" or "estuarine and marine waters". As waters of the State, wetlands are subject to all pertinent provisions of the Maine Water Classification Program statute (38 M.R.S. §§ 464 et seq.) including designated uses, narrative biological criteria and the State's anti-degradation policy. Wetlands that are part of great ponds or natural lakes and ponds less than 10 acres in size are considered GPA waters. All freshwater wetlands not classified as GPA waters are classified under §§ 467 and 468 (Classification of Major River Basins and Classification of Minor Drainages) according to the drainage basin in which they occur and the classification of associated water bodies. Where not otherwise specified, wetlands assume the default classifications listed for tributaries, since virtually all wetlands in the State drain to other water bodies via surface and/or groundwater. Coastal wetlands are classified under the provisions of 38 M.R.S. § 469 (Classification of Estuarine and Marine Waters).

Narrative Aquatic Life Use Criteria

The following is a summary of pertinent narrative aquatic life criteria:

Class GPA waters, including wetlands associated with great ponds and natural ponds and lakes less than 10 acres in size:

Habitat for fish and aquatic life must be characterized as natural. Must have stable or decreasing trophic state, subject to natural fluctuations, and be free of culturally induced algal blooms which impair use and enjoyment.

Fresh surface waters not classified GPA, including wetlands associated with rivers and streams:

Class AA: Habitat for fish and aquatic life must be characterized as free-flowing and natural. Aquatic life shall be as naturally occurs.

Class A: Habitat for fish and aquatic life must be characterized as natural. Aquatic life shall be as naturally occurs.

Class B: Habitat for fish and aquatic life must be characterized as unimpaired. Must support all indigenous aquatic species without detrimental changes in the resident biological community.

Class C: Some changes to aquatic life allowed. Must support all indigenous fish species. Structure and function of the resident biological community must be maintained.

Wetland Numeric Biocriteria Development

The Biological Monitoring Program assesses the condition of rivers, streams and wetlands by sampling aquatic macroinvertebrates and algae. Once samples are processed and identified, DEP biologists use statistical models to help determine if wetlands meet their legislatively-assigned water quality class based on narrative tiered aquatic life criteria. The models enable the Biological Monitoring Program to provide data users with standardized assessments of wetland condition and will be the basis for wetland-specific numeric biocriteria once implemented through rule-making, which will begin in 2022. Monitoring and assessment results are used to inform a variety of resource management activities and regulatory programs.

INTEGRITY OF WETLAND RESOURCES

Contact: Jeanne DiFranco, DEP, BWQ, DEA

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Related Website: www.maine.gov/dep/water/monitoring/biomonitoring/index.html

Wetland Biological Monitoring and Assessment

Current monitoring focuses on shallow wetlands having emergent, floating and/or submerged plant communities. Annual wetland monitoring is coordinated with river and stream monitoring statewide using a 5-year rotating basin approach. In addition to macroinvertebrates and algae, biologists monitor chemical and physical water quality characteristics and document common plants, habitat characteristics, land use, and potential environmental stressors in the watershed. The Biomonitoring Program is also testing standardized protocols to assess wetland plant communities which will enable biologists to evaluate additional wetland types.

Wetland Monitoring and Assessment Activities for 2015 - 2020

2015: Biological monitoring and assessment was focused in southern Maine watersheds and included 25 emergent/aquatic bed wetland sites. Six of these sites are part of wetland compensatory mitigation projects. In addition, DEP biologists partnered with the Maine Natural Areas Program to sample 12 red maple swamps as part of a forested wetland assessment pilot project. The project included assessments of plant communities, soils, hydrology and field-based and remote (GIS) stressor assessments. Data collected will be applied in testing State and regional Floristic Quality Assessment Indices.

2016: Biological monitoring and assessment was focused in the Penobscot River and downeast watersheds and included 20 emergent/aquatic bed wetland sites. DEP biologists also participated in EPA's 2016 National Wetland Condition Assessment (NWCA) and coordinated a multi-agency team including Maine DEP, Maine Natural Areas Program, Natural Resources Conservation Service and Maine Conservation Corps staff. The team completed intensive sampling at 7 NWCA sites across Maine using EPA's protocols. Additional information about the NWCA can be found at: www.epa.gov/national-aquatic-resource-surveys/nwca.

2017: Biological monitoring and assessment was focused in the Kennebec River watershed and included 27 emergent/aquatic bed wetland sites. Aquatic macrophyte assessments were conducted at 7 of the 27 wetland sites sampled.

2018: Biological monitoring and assessment was focused in the Androscoggin River watershed and included 19 emergent/aquatic bed wetland sites. Two of these sites are part of wetland compensatory mitigation projects. Aquatic macrophyte assessments were conducted at 5 of the 19 wetland sites sampled.

2019: Biological monitoring and assessment was focused in St John and Allagash River watersheds and included 18 emergent/aquatic bed wetland sites. Six of these sites are part of wetland compensatory mitigation projects. Aquatic macrophyte assessments were conducted at 4 of the 18 wetland sites sampled.

2020: Biological monitoring and assessment was focused in the southern Maine watersheds. Due to COVID-19 safety restrictions in place, sampling for 2020 was not possible for some sample methods including sampling wetlands from canoes. As a result, 5 emergent/aquatic bed wetland sites were sampled in 2020, all of which are part of wetland compensatory mitigation projects. Aquatic macrophyte assessments were conducted at all 5.

Summary of Wetland Aquatic Life Use Attainment

Aquatic life use attainment decisions for wetlands included in the 2018/2020/2022 Integrated Report are based on expert judgment of DEP biologists using the statutory narrative aquatic life use criteria described above as guidance. DEP biologists examined macroinvertebrate data for each wetland site sampled to evaluate structure and function of the resident biological community, and assigned an attained water quality class by consensus. For Category 3-5 wetlands that are located in a river/stream or lake/pond (e.g. a wetland that occurs in a slow-flowing section of a stream), any impairments, for example to the fish consumption use, that are listed for the related river/stream or lake/pond assessment unit (AU) are also assigned to the wetland AU. For Category 3-5 wetlands that are not located in a river/stream or lake/pond, DEP biologists will decide on a case-by-case basis whether any other impairments should be carried over or not.

EPA requires that each AU is placed into one of five categories (see Chapter 4, Assessment Methodology). A summary of wetland attainment status follows, and also appears in Table 4- 9. Information on the status of individual wetland AUs may be found in Appendix IV: Wetlands.

Category 1: Wetlands attaining all designated uses and water quality standards, and no use is threatened.

No changes were made to Category 1 as part of this 2018/2020/2022 assessment. There remains 1 AU (15 acres) in Category 1.

Category 2: Wetlands attaining some of the designated use(s), no use is threatened, and insufficient data or no data and information is available to determine if the remaining uses are attained or threatened (with presumption that all uses are attained).

DEP determined with high confidence that these waters attain their assigned aquatic life use based on aquatic macroinvertebrate community composition. In addition, a review of other available data including physical/chemical attributes, field-based stressor information and spatial data do not indicate potential causes of impairment.

Category 2 contains 83 wetland AUs. Two AUs (totaling 68.64 acres) were newly added to Category 2 in the 2018/2020/2022 assessment, and 3 AUs (totaling 3787.71 acres) were moved to Category 3. Acreages for all AUs have not been determined, but those that have been determined (41) total 6,556.77 acres. One of these 83 AUs (totaling 212 acres) is also in Category 5-D for legacy PCB and dioxin sources, bringing the acreage of Category 2-only AUs to 6,344.77.

Category 3: Wetlands with insufficient data and information to determine if designated uses are attained (with presumption that one or more uses may be impaired).

There are 21 wetland AUs totaling 6,933.97 acres listed in Category 3. Eight AUs (totaling 1,560.25 acres) were newly added to Category 3 in the 2018/2020/2022 assessment, 3 AUs (totaling 3787.71 acres) were moved to Category 3 from Category 2, and 2 AUs (totaling 159 acres) were removed from Category 2 and moved to Category 5.

Wetlands assigned to this category have conflicting or insufficient available data to determine attainment status with relative certainty. For the sites listed, there is significant evidence of human stressors, with the presumed likelihood they are causing impairment of one or more uses.

Category 4: Wetlands that are impaired or threatened for one or more designated uses, but do not require development of a TMDL.

No changes were made to Categories 4 as part of the 2018/2020/2022 assessment.

Category 5: Wetlands that are impaired or threatened for one or more designated uses by a pollutant(s), TMDL development is required.

Two AUs (totaling 172 acres) were moved into Category 5 as part of the 2018/2020/2022 assessment.

EXTENT OF WETLAND RESOURCES

Wetland Loss Tracking in Maine's Organized Towns

Contact: Mark Stebbins, DEP, BLR, DLR

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Maine DEP tracks permitted wetland impacts in the organized townships through an application tracking system. When applications for wetland alterations are logged in, the amount of fill or area to be altered is entered by wetland type and geographical location. This system enables DEP to monitor and report on annual wetland losses. Permitted wetland impacts for 2015 through 2020 are summarized in Tables 5-1 through 5-6 below.

Table 5-1 Permitted Wetland Impacts in the Organized Townships for 2015

Source: Maine DEP Wetland Loss Tracking System. Report period from 1/1/2015 to 12/31/2015. For each category of wetland type the first row is the amount altered wetland and the second row is amount filled, in acres.

	FULL NRPA	TIER 1	TIER 2	Total
EMERGENT	0.00	0.00	0.00	0.00
	0.03	0.30	0.06	0.40
FORESTED	0.00	1.85	3.07	4.92
	14.69	7.33	1.53	23.55
GREAT POND	0.35	0.00	0.00	0.35
	0.02	0.00	0.00	0.02
INTERTIDAL-MUDFLAT	0.08	0.00	0.00	0.08
	0.19	0.00	0.00	0.19
INTERTIDAL-OTHER	0.68	0.00	0.02	0.70
	0.49	0.00	0.00	0.49
INTERTIDAL-VEGETATED	0.01	0.00	0.00	0.01
	0.06	0.00	0.00	0.06
OPEN WATER	13.69	0.00	0.00	13.69
	0.00	0.00	0.00	0.00
OTHER/MIXED	12.94	0.00	0.00	12.94
	0.01	0.43	0.00	0.44
RIVERINE	0.00	0.00	0.00	0.00
	0.02	0.00	0.00	0.02
SCRUB-SHRUB	6.32	0.33	0.00	6.65
	0.03	1.59	0.39	2.01
SUBTIDAL-AQUATIC BED	0.08	0.00	0.00	0.08
	0.09	0.00	0.00	0.09
SUBTIDAL-OTHER	0.07	0.00	0.00	0.07
	0.00	0.00	0.00	0.00
UPLAND	0.0	0.00	0.00	0.0
	0.00	0.00	0.00	0.00
WET MEADOW	0.02	0.40	0.0	0.42
	0.00	2.04	0.18	2.22
Total: Altered	34.25	2.59	3.09	39.92
Filled	15.63	11.70	2.16	29.49

Table 5-2 Permitted Wetland Impacts in the Organized Townships for 2016

Source: Maine DEP Wetland Loss Tracking System. Report period from 1/1/2016 to 12/31/2016. For each category of wetland type the first row is the amount altered wetland and the second row is amount filled, in acres.

	FULL NRPA	TIER 1	TIER 2	Total
EMERGENT	0.01	0.00	0.00	0.01
	0.00	0.45	0.00	0.45
FORESTED	0.14	0.76	14.88	15.79
	3.15	7.72	0.00	10.87
GREAT POND	0.0	0.00	0.00	0.0
	0.07	0.00	0.00	0.07
INTERTIDAL-MUDFLAT	0.28	0.00	0.00	0.28
	0.06	0.00	0.00	0.06
INTERTIDAL-OTHER	0.23	0.00	0.00	0.23
	0.34	0.00	0.00	0.34
INTERTIDAL-VEGETATED	0.03	0.00	0.00	0.03
	0.03	0.00	0.00	0.03
OPEN WATER	77.12	0.00	0.00	77.12
	0.76	0.00	0.00	0.76
OTHER/MIXED	0.0	0.0	0.0	0.0
	1.41	0.54	0.15	2.10
RIVERINE	0.79	0.00	0.00	0.79
	0.00	0.00	0.00	0.00
SCRUB-SHRUB	0.56	0.28	0.06	0.90
	0.23	2.78	0.00	3.01
SUBTIDAL-AQUATIC BED	0.07	0.00	0.00	0.07
	0.01	0.00	0.00	0.01
SUBTIDAL-OTHER	1.38	0.00	0.00	1.38
	2.71	0.00	0.00	2.71
UPLAND	0.0	0.0	0.0	0.0
	6.04	0.00	0.00	6.04
VERNAL POOL	0.0	0.00	0.00	0.0
	0.83	0.00	0.00	0.83
WET MEADOW	0.0	0.01	0.0	0.01
	1.71	0.77	0.04	2.52
Total: Altered	80.61	1.06	14.94	96.61
Filled	17.35	12.26	0.19	29.81

Table 5-3 Permitted Wetland Impacts in the Organized Townships for 2017

Source: Maine DEP Wetland Loss Tracking System. Report period from 1/1/2017 to 12/31/2017. For each category of wetland type the first row is the amount altered wetland and the second row is amount filled, in acres.

	FULL NRPA	TIER 1	TIER 2	Total
EMERGENT	0.00	0.0	0.00	0.0
	0.02	0.03	0.00	0.05
FORESTED	1.69	1.06	14.46	17.21
	0.07	10.27	3.54	13.88
GREAT POND	0.96	0.00	0.00	0.96
	0.09	0.00	0.00	0.09
INTERTIDAL-MUDFLAT	0.24	0.00	0.00	0.24
	0.19	0.00	0.00	0.19
INTERTIDAL-OTHER	0.48	0.0	0.00	0.48
	0.61	0.0	0.00	0.61
INTERTIDAL-VEGETATED	0.13	0.00	0.00	0.13
	0.05	0.00	0.00	0.05
OPEN WATER	5.17	0.00	0.00	5.17
	0.00	0.00	0.00	0.00
OTHER/MIXED	0.00	0.0	0.00	0.00
	0.18	0.46	0.00	0.64
RIVERINE	0.76	0.00	0.00	0.76
	0.45	0.00	0.00	0.45
SCRUB-SHRUB	0.0	0.26	0.0	0.26
	0.10	1.30	0.50	1.90
SUBTIDAL-AQUATIC BED	0.05	0.00	0.00	0.05
	0.01	0.00	0.00	0.01
SUBTIDAL-OTHER	0.63	0.00	0.00	0.63
	0.22	0.00	0.00	0.22
UPLAND	0.00	0.09	0.00	0.09
	0.01	0.05	0.00	0.06
VERNAL POOL	0.00	0.00	0.96	0.96
	0.00	0.00	0.00	0.00
WET MEADOW	0.00	0.34	0.0	0.34
	1.44	1.07	0.12	2.64
Total: Altered	10.11	1.75	15.42	27.28
Filled	3.44	13.18	4.17	20.79

Table 5-4 Permitted Wetland Impacts in the Organized Townships for 2018

Source: Maine DEP Wetland Loss Tracking System. Report period from 1/1/2018 to 12/31/2018. For each category of wetland type the first row is the amount altered wetland and the second row is amount filled, in acres.

	FULL NRPA	TIER 1	TIER 2	Total
EMERGENT	0.00	0.0	0.00	0.00
	2.03	0.01	0.36	2.40
FORESTED	0.40	2.90	1.57	4.86
	2.75	6.87	4.87	14.49
GREAT POND	0.06	0.00	0.00	0.06
	0.04	0.00	0.00	0.04

	FULL NRPA	TIER 1	TIER 2	Total
INTERTIDAL-MUDFLAT	0.14	0.00	0.00	0.14
	0.02	0.00	0.00	0.02
INTERTIDAL-OTHER	0.55	0.0	0.00	0.55
	0.46	0.01	0.00	0.46
INTERTIDAL-VEGETATED	0.05	0.00	0.00	0.05
	0.03	0.00	0.00	0.03
OPEN WATER	18.87	0.00	0.00	18.87
	0.12	0.00	0.00	0.12
OTHER/MIXED	0.0	0.07	0.0	0.07
	2.45	0.20	0.65	3.30
SCRUB-SHRUB	0.28	0.24	0.00	0.53
	0.03	0.50	0.00	0.53
SUBTIDAL-AQUATIC BED	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
SUBTIDAL-OTHER	0.46	0.00	0.00	0.46
	0.00	0.00	0.00	0.00
UPLAND	0.0	0.00	0.00	
	0.00	0.00	0.00	0.00
WET MEADOW	0.00	0.19	0.00	0.19
	0.00	1.09	0.16	1.25
Total: Altered	20.82	3.41	1.57	25.79
Filled	7.94	8.68	6.04	22.66

Table 5-5 Permitted Wetland Impacts in the Organized Townships for 2019

Source: Maine DEP Wetland Loss Tracking System. Report period from 1/1/2019 to 12/31/2019. For each category of wetland type the first row is the amount altered wetland and the second row is amount filled, in acres.

	FULL NRPA	TIER 1	TIER 2	Total
EMERGENT	0.02	0.29	0.00	0.31
	1.67	0.90	0.42	2.98
FORESTED	107.09	2.91	9.97	119.98
	9.24	12.11	1.12	22.47
GREAT POND	0.88	0.00	0.00	0.88
	0.32	0.00	0.00	0.32
INTERTIDAL-MUDFLAT	0.03	0.00	0.00	0.03
	0.08	0.00	0.00	0.08
INTERTIDAL-OTHER	0.52	0.00	0.00	0.52
	1.62	0.00	0.00	1.62
INTERTIDAL-VEGETATED	0.01	0.00	0.00	0.01
	0.04	0.00	0.00	0.04
OPEN WATER	0.00	0.00	0.00	0.00
	0.13	0.00	0.00	0.13
OTHER/MIXED	0.0	0.08	0.0	0.08
	0.36	0.90	0.08	1.33
RIVERINE	0.15	0.00	0.00	0.15
	2.55	0.00	0.00	2.55
SCRUB-SHRUB	2.23	0.21	0.0	2.44

	FULL NRPA	TIER 1	TIER 2	Total
	0.13	1.74	1.16	3.03
SUBTIDAL-AQUATIC BED	0.14	0.00	0.00	0.14
	0.00	0.00	0.00	0.00
SUBTIDAL-OTHER	1.56	0.00	0.00	1.56
	0.02	0.00	0.00	0.02
UPLAND	25.57	0.0	0.0	25.57
	0.00	0.00	0.00	0.00
VERNAL POOL	3.68	0.00	0.00	3.68
	0.69	0.00	0.00	0.69
WET MEADOW	11.15	0.49	4.19	15.84
	0.35	1.12	0.83	2.30
Total: Altered	153.04	3.98	14.17	171.19
Filled	17.20	16.77	3.60	37.57

Table 5-6 Permitted Wetland Impacts in the Organized Townships for 2020

Source: Maine DEP Wetland Loss Tracking System. Report period from 1/1/2020 to 12/31/2020. For each category of wetland type the first row is the amount altered wetland and the second row is amount filled, in acres.

	FULL NRPA	TIER 1	TIER 2	Total
EMERGENT	0.02	0.09	0.00	0.11
	1.58	0.35	0.42	2.35
FORESTED	107.02	1.14	5.92	114.08
	7.09	6.30	0.31	13.70
GREAT POND	0.08	0.00	0.00	0.08
	0.18	0.00	0.00	0.18
INTERTIDAL-MUDFLAT	0.03	0.00	0.00	0.03
	0.05	0.00	0.00	0.05
INTERTIDAL-OTHER	0.30	0.00	0.00	0.30
	0.98	0.00	0.00	0.98
INTERTIDAL-VEGETATED	0.0	0.00	0.00	0.0
	0.00	0.00	0.00	0.00
OPEN WATER	0.00	0.00	0.00	0.00
	0.11	0.00	0.00	0.11
OTHER/MIXED	0.0	0.0	0.0	0.0
	0.01	0.37	0.08	0.45
RIVERINE	0.15	0.00	0.00	0.15
	0.15	0.00	0.00	0.15
SCRUB-SHRUB	2.23	0.0	0.0	2.23
	0.00	0.77	0.26	1.04
SUBTIDAL-AQUATIC BED	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
SUBTIDAL-OTHER	1.02	0.00	0.00	1.02
	0.02	0.00	0.00	0.02
UPLAND	25.57	0.0	0.0	25.57
	0.00	0.00	0.00	0.00
VERNAL POOL	3.68	0.00	0.00	3.68

	FULL NRPA	TIER 1	TIER 2	Total
	0.0	0.00	0.00	0.0
WET MEADOW	11.15	0.49	2.98	14.63
	0.35	0.47	0.26	1.07
Total: Altered	151.25	1.72	8.91	161.88
Filled	10.53	8.26	1.32	20.11

CHAPTER 6 GROUNDWATER MONITORING & ASSESSMENTS

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Related Website: www.maine.gov/dep/water/groundwater/index.html

OVERVIEW

Public interest in groundwater is primarily focused on its use as a drinking water supply (groundwater provides 60% of all human demand and 75% of livestock demand statewide) and on its use as a source of process water for industry. Important sources of groundwater contamination in Maine include disposal activities such as septic systems and landfills, leaking storage facilities, agriculture, spilled hazardous materials, winter salt applications, or previously unregulated activities.

Monitoring groundwater at a particular site is typically done to gather data on water quality impacts of particular activities. Most of the groundwater data collected in Maine is the result of permit conditions, enforcement agreements or impact assessments. The Environmental and Geographic Analysis Database (EGAD) at DEP contains many of these data which are potentially useful for research purposes and they are accessible to the public. This database enhances the ability of DEP to communicate and report groundwater and other data to EPA and other state or federal agencies, and to share information with the general public.

Maine's groundwater may be threatened by contamination, particularly in the unforested areas that comprise approximately 11% of the State. Important sources of groundwater contamination in Maine include disposal activities such as landfills and septic systems, leaking storage facilities, agriculture, and sites contaminated by hazardous materials spills, winter salt applications, or by previously unregulated activities.

Groundwater is withdrawn from three basic types of aquifers in Maine: unconsolidated glaciofluvial deposits (stratified drift or sand and gravel aquifers), till, and fractured bedrock. The stratified drift deposits are the most favorable for development of large-volume water supply wells, but these deposits are limited in size and distribution, comprising less than ~10% of the state. Discontinuous bedrock aquifers underlie the entire state and are used for domestic, commercial, industrial, and agricultural purposes, and to supply small public facilities such as schools, restaurants, and summer camps. Wells in till do not generally yield large quantities of water and are most often used for individual domestic water supplies.

Generally, the groundwater supply in Maine is adequate. The total withdrawal of groundwater by all water users is less than one percent of the annual groundwater recharge each year. The remaining annual groundwater recharge is lost through evapotranspiration or discharges to ponds, lakes, rivers, streams, and the Atlantic Ocean. Seasonal variations in water tables can lead to local groundwater shortages. The Maine Drought Task Force (convened by the Maine Emergency Management Agency) publishes information on Maine groundwater and surface water levels at the following websites:

www.maine.gov/mema/hazards/drought-task-force
www.maine.gov/dhhs/mecdc/environmental-health/dwp/pws/drought.shtml and www.state.me.us/rfac/. The USGS also maintains information on groundwater and

surface water levels in Maine, available at the following website: www.usgs.gov/centers/new-england-water.

Background

The protection of Maine groundwater is an issue of concern at all levels of government. Serious groundwater pollution problems have occurred throughout the State and have raised awareness of the need for protecting groundwater supplies. A few municipalities and regional planning agencies have conducted groundwater quality assessment studies, but programs for comprehensive assessment of the quality of groundwater resources are needed. Maine's groundwater protection programs emphasize three areas of effort:

1. Interagency coordination of groundwater programs;
2. Assessment of groundwater protection problems, including enhancement of the Environmental and Geographic Analysis Database (EGAD); and
3. Statutory changes to enable building upon implemented state groundwater protection programs to increase groundwater protection and risk reduction.

Assessment of Groundwater Quality

In Maine, groundwater is classified by its suitability for drinking water purposes. Under the Maine Water Classification Program, groundwater is classified as either potable (GW-A) or unpotable (GW-B). Water is unpotable when the concentrations of chemical compounds detected exceed either the Maximum Contaminant Levels (MCL) or the Maximum Exposure Guidelines (MEG) as defined in the Rules Relating to Drinking Water administered by the Maine Department of Health and Human Services (DHHS). Although there are many localities where groundwater is unpotable and highly contaminated, no groundwater is currently classified GW-B. The state is not currently attempting to designate non-attainment areas.

Aquifer Risk Assessment

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The state is actively assessing ways to use existing groundwater data and spatial data to evaluate relative risk to existing and potential water supplies. The cumulative impact of residential, commercial, and industrial development on 300 of the significant sand and gravel aquifers mapped by the Maine Geological Survey (MGS) is being evaluated through the Aquifer Quantitative Use Assessment (AQUA) Index. This GIS-based tool assesses both nonpoint source risks due to population and travel corridors as well as the presence and relative risk of pollutant sources identified in EGAD site date, including petroleum tanks (underground or aboveground storage tanks, USTs or ASTs, respectively), former tank locations (i.e. possible legacy contamination), large wastewater disposal systems, hazardous waste generators, landfills, and waste application sites. The tools weights and combines values based on these factors to yield the dimensionless AQUA index from 0.0 to 1.0 or 0% to 100%; an AQUA index of 1.0 or 100% indicates little or no anthropogenic risk to groundwater quality. In general, larger overall acreage in combination with remoteness or other limits on development

results in a higher AQUA index. This tool may be used to assess the relative risk to present or future municipal, private, or commercial drinking water sources and to identify those aquifers most at risk from existing or future commercial, industrial, or residential development.

Overall, 77 high yield aquifers (26%) are non-impacted (4,881 acres or 16% of total acres), 145 (48%) are less than 50% impacted (8,540 acres or 29% of total acres), and 78 (26%) are more than 50% impacted (13,325 acres or 55% of total acres (29,746). Of the non-impacted high yield sand and gravel aquifers, 18% have public water supply wells. Of the aquifers with AQUA values between 1.0 and 0.5, 28% have public water supply wells, while, of those with AQUA values less than 0.5, 38% have public water supply wells.

Additional work on risk assessment includes analysis of the effect of road salt on residential well water quality in seventy-seven areas spatially distributed throughout Maine; this analysis is based on a large data set compiled by the Maine Department of Transportation, from which over 3000 well locations have been verified by Maine DEP to date. Major results of this work were presented at the 2019 meeting of the Geological Society of America, Northeastern Section, and a complete report is in preparation. This work confirms the dependence of chloride concentration on slope and distance from road indicated by previous Department studies, and demonstrates that there is a significant relationship between slope angle and preferred orientation of sub-vertical bedrock fractures and the potential for chloride contamination. Other significant factors include overburden type and thickness and hydrologic soil group. Work is underway to determine whether a functional relationship can be demonstrated between these vectors and the chloride data distribution, and also to evaluate mechanisms for storage of chloride in soils and shallow aquifers, an effect which has also been observed downgradient of stormwater infiltration systems. The Maine DOT data set includes a wide range of anthropogenic and natural contaminants, and additional work by Maine DEP, also presented at the 2019 meeting, demonstrates that risk assessment tools for bedrock aquifers, also developed by the Department, show clear differences between these contaminant sources and demonstrate that overburden type and thickness are the primary factors controlling risk of anthropogenic contamination in Maine.

Aquifer Characterization Activities

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Related Websites:

Aquifer Fact Sheet www.maine.gov/dacf/mgs/frontend/homeowners.htm

Aquifer Mapping: www.maine.gov/dacf/mgs/pubs/digital/aquifers.htm

Aquifer data and publications: www.maine.gov/dacf/mgs/pubs/index.shtml

MGS is at the "average characteristics" stage in characterizing the physical and chemical attributes of the State's stratified drift aquifers. While site specific data do exist for some aquifers (primarily in the vicinity of groundwater resource evaluation projects and contamination sites), complete physical pictures of most aquifer systems do not exist. Hard data on the exact natural chemical processes controlling groundwater chemical evolution that occur along a flow path in sand and gravel aquifers

are also lacking. MGS has some ambient water quality data but has not yet fully characterized any particular aquifer system. The Maine Geological survey in cooperation with the USGS has conducted two detailed basin level sand and gravel aquifer investigations aimed at long-term water availability. These ground water modelling studies were conducted examining the basins contributing water to the Freeport Water District wells (pubs.usgs.gov/sir/2011/5227/pdf/sir2011-5227_text_508.pdf) and the Kennebunk, Kennebunkport and Wells Water District (KKWWD) wells (pubs.usgs.gov/sir/2014/5235/pdf/sir2014-5235.pdf). These basin areas were selected based upon the size in relation to total population served and were thought to be potentially at risk. There are other areas in Maine which could likely benefit from similar investigation, but there currently are not the funds to pay for the extensive field hydrologic assessments and detailed ground water modelling necessary to undertake this work.

MGS has begun preliminary examination of annual physical groundwater data from selected wells at DEP monitoring sites in both sand and gravel aquifers and in bedrock aquifers. This effort is to supplement data in the statewide groundwater monitoring system conducted by the USGS as part of its annual groundwater monitoring program.

Presently, it is believed the greatest contaminant threat to ground water is from the PFAS-PFOA-PFOS family of compounds (www.maine.gov/dep/spills/topics/pfas/Maine-CDC-PFOS-PFOA-Exposure-Factsheet-09.23.2020.pdf). The State of Maine has been responding to discharges associated with these compounds (www.maine.gov/dep/spills/topics/pfas/index.html). At KKWWD, their Cohen gravel-packed well situated along the Kennebunk River off the end of Kimball Road in Kennebunk was among the first public water supply wells to be impacted from this class of chemicals from a nearby dairy farm. This farm situated on the opposite side of the river from the well, had earlier received sludge containing these compounds for spreading on their fields (www.evoqua.com/en/case-studies/kennebunkport-drinking-water-activated-carbon/). These compounds are extremely persistent and very difficult to remediate and will likely be a focus contaminant in ground water in both sand and gravel aquifers and fractured bedrock aquifers for many years.

Significant Groundwater Wells

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Related Website: www.maine.gov/dep/land/nrpa/significant_groundwater_wells/

Although Maine has abundant groundwater when recharge and use are averaged over the state, certain large wells, and the density of smaller wells in certain areas, may have adverse effects on nearby protected resources and wells. Installation and operation of large groundwater extraction wells, with certain exceptions, is now regulated under the Natural Resources Protection Act (NRPA). Applicants must demonstrate that the extraction of groundwater will not have an unreasonable adverse impact on waters of the State, groundwater-related natural resources, and existing uses, including, but not limited to, public or private wells. Applicants must submit adequate background data, including stream flows and wetted perimeter and wetland water levels, pump test data and analysis, and a site-specific plan for monitoring groundwater elevation, precipitation, and other relevant hydrogeologic criteria. The Department must consider both the direct effects of the proposed withdrawal and its effects in combination with existing water withdrawals, and must establish in each

approval site-specific and season-specific performance criteria for flows and water levels. Applicants must conduct monitoring to demonstrate compliance with these criteria, and implement remedial actions, such as reduction in pumping and stream supplementation, when required, Ongoing review of these operation and monitoring data by the Department and others indicate that the criteria developed by the Department and specified in the approvals are adequately protecting surface water and groundwater resources to date.

Overview of Groundwater Contamination Sources

Most groundwater contamination in Maine originates from nonpoint source pollution rather than point source pollution. This section highlights primarily nonpoint contamination sources that appear to be responsible for much of the groundwater contamination in the State, and the programs in place to study, regulate, and remediate these contamination sources.

EMERGING CONTAMINANTS, PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

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Related Website: www.maine.gov/dep/spills/topics/pfas/index.html

The DEP's Bureau of Remediation and Waste Management is tasked with remediating contaminated sites, responding to oil spills and hazardous material incidents, and administering Maine's petroleum, hazardous material, solid waste, and materials management programs. As part of this charge, BRWM staff also investigate the presence of emerging contaminants including per- and polyfluoroalkyl substances (PFAS) in the environment.

Highlights

In 2019, Governor Janet Mills established a Task Force to identify the extent of PFAS exposure in Maine, examine the risks of PFAS to Maine residents and the environment, and recommend State approaches to most effectively address this risk. The Final Report, Managing PFAS in Maine, dated January 2020, provides several recommendations including testing private drinking water in areas where groundwater is likely to have been contaminated by PFAS at unsafe levels, such as at manufacturing locations that utilized PFAS, unlined landfills, areas where Class B Aqueous Film-Forming Foam has been discharged or stored, and residuals land application sites. PFAS testing at these sites is ongoing. Monitoring data is compiled and uploaded into the Department's Environmental and Geographic Analysis Database. An interactive map, which is updated periodically, has been developed that illustrates locations sampled and corresponding results.

For residential drinking water, the Department is applying the Interim Drinking Water Standard of 20 parts per trillion (ppt) to the sum of 6 PFAS (PFOA, PFOS, PFNA, PFHxS, PFHpA, PFDA) as established by Resolve 2021, ch. 82, Resolve, To Protect Consumers of Public Drinking Water by Establishing Maximum Contaminant Levels for Certain Substances and Contaminants, Emergency, effective June 21, 2021. Subject to available funding, the Department is paying for the installation and maintenance of

filter systems for private residential water supplies where Maine's Interim Drinking Water Standard has been exceeded. The Department is pursuing additional funding and other remedies for a long-term sustainable strategy and to ensure affected homeowners have safe water to drink. As PFAS contamination continues to undergo investigation, BRWM staff also continue to coordinate with members of the PFAS Task Force as well as other state and federal agencies, impacted communities, and residents throughout Maine.

OVERVIEW OF STATE GROUNDWATER PROTECTION PROGRAMS

Table 6-1 provides a list of State groundwater protection programs, their implementation status, responsible State agency, and a link to the primary webpage of each program. Abbreviations used are: DACF, Department of Agriculture, Conservation and Foresty; DEP, Department of Environmental Protection; DHHS, Department of Health and Human Services; DOT, Department of Transportation; MEMA, Maine Emergency Management Agency; MGS, Maine Geological Survey (within DACF).

Table 6-1 Table of State Groundwater Protection Programs

Programs or Activities	Implementation Status	Responsible State Agency	Hyperlink to Webpage
Active SARA Title III Program	Continuing efforts	MEMA	www.maine.gov/mema/maine-prepares/plans-trainings-exercises/serc/about/members-duties-funding
Ambient groundwater monitoring system	Under Development	MGS	www.maine.gov/dacf/mgs/about/index.shtml
Aquifer vulnerability assessment	Continuing efforts	DHHS	www.maine.gov/dhhs/mecdc/environmental-health/dwp/pws.shtml
Aquifer mapping	Continuing efforts	MGS	www.maine.gov/dacf/mgs/explore/water/index.shtml
Aquifer characterization	Continuing efforts	MGS	www.maine.gov/dacf/mgs/explore/water/index.shtml
Comprehensive data management system	Continuing efforts	DEP	www.maine.gov/dep/maps-data/egad/index.html
Groundwater discharge permits	Continuing efforts	DEP	www.maine.gov/dep/water/wd/subsurface/index.html
Groundwater Best Management Practices	Continuing efforts	DHHS	www.maine.gov/dhhs/mecdc/environmental-health/dwp/sitemap/wrt.shtml
Groundwater legislation	Continuing efforts	DHHS	www.maine.gov/dhhs/mecdc/environmental-health/dwp/sitemap/cet.shtml
Groundwater classification	Fully established	DEP	www.maine.gov/dep/water/laws/index.html
Groundwater quality standards	Continuing efforts	DHHS	www.maine.gov/dhhs/mecdc/environmental-health/dwp/cet/documents/DrinkingWaterRules.pdf
Interagency coordination for groundwater protection initiatives	Continuing efforts	DEP, DHHS, MGS, DOT, DACF	www.maine.gov/dacf/mgs/explore/water/index.shtml
Nonpoint source controls	Continuing efforts	DEP	www.maine.gov/dep/land/watershed/nps/index.html
Pesticide State Management Plan	Plan completed	DACF	apps.web.maine.gov/dacf/php/pesticides/public/water_quality.shtml

Programs or Activities	Implementation Status	Responsible State Agency	Hyperlink to Webpage
Pollution Prevention Program	Fully established	DEP	www.maine.gov/dep/assistance/whatisp2.html
Resource Conservation and Recovery Act (RCRA) Primacy	Fully established	DEP	https://www.maine.gov/dep/waste/hazardouswaste/index.html
State Superfund, Brownfield, and other Hazardous Substance Sites	Fully established	DEP	www.maine.gov/dep/spills/federalfacilities/index.html www.maine.gov/dep/spills/programs/index.html
State septic system and subsurface wastewater disposal regulations	Fully established	DHHS	www.maine.gov/dhhs/mecdc/environmental-health/plumb/index.htm www.maine.gov/dhhs/mecdc/environmental-health/plumb/policies/policy03.htm
Underground storage tank installation requirements and UST Permit Program	Fully established	DEP	www.maine.gov/dep/waste/ust/index.html
Underground storage tank Remediation Fund	Fully established	DEP	www.maine.gov/dep/spills/groundwater/index.html
Underground Injection Control Program	Fully established	DEP	www.maine.gov/dep/water/wd/uic/index.html
Vulnerability assessment for drinking water/wellhead protection	Continuing efforts	DHHS	www.maine.gov/dhhs/mecdc/environmental-health/dwp/pws.shtml
Wellhead Protection Program (EPA-approved)	Fully established	DHHS	www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/financialResources.shtml
Well installation regulations	Fully established	DHHS, MGS	www.maine.gov/dhhs/mecdc/environmental-health/dwp/consumers.shtml
Landfills- Solid Waste Management	Fully established	DEP	www.maine.gov/dep/waste/solidwaste/index.html
Aboveground Storage Tank Regulations	Fully established	DEP	www.maine.gov/dep/waste/abovegroundtanks/index.html
Oil or Hazardous Materials Spill Response	Fully established	DEP	www.maine.gov/dep/rwm/hoss/
Road Salt and Sand-Salt Piles- storage, siting, spreading	Fully established	DOT, DEP	www.maine.gov/dep/water/wd/sandsalt/index.html www.maine.gov/mdot/csd/sandsalt/saltstorage.htm www.maine.gov/mdot/csd/mlrc/technical/winterplowsand/

OTHER PROGRAMS

Stormwater Infiltration

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Use of infiltration as a stormwater management technique is common in many regions, but is practical in Maine only in the limited areas underlain by glacial sand and gravel deposits. These aquifers contain large volumes of easily extracted water, but are highly vulnerable to contamination. Groundwater monitoring at large commercial and industrial sites shows that the volume of pollutants discharged to these infiltration systems generally exceeds the treatment capacity of the soil and aquifer. Chloride is the most common pollutant, but data also indicate that changes in chemical conditions in the infiltration systems, principally related to low oxygen concentrations in basin waters and volumes of the aquifer affected by infiltration, can release accumulated metals and other pollutants to the underlying aquifer over time. Chloride concentrations in groundwater downgradient of large infiltration basins have frequently been shown to exceed aquatic life criteria; together with the very low DO concentrations observed in some plumes downgradient of infiltration areas, these data indicate that infiltration of water from large connected impervious areas may not be ideal to support baseflow conditions. These data are consistent with findings in other states and in the European Union, and have been cited by EPA in a recent summary of stormwater recharge methods. Ongoing work on stormwater management rules is intended to encourage infiltration, where geologically feasible, from low-pollutant sources, while discouraging concentrated discharges to groundwater from large areas of connected impervious surface. Groundwater monitoring will continue at currently-monitored sites.

Metallic Mining

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Related Website: www.maine.gov/dep/land/mining/index.html

In 2011, the Maine Legislature enacted a law directing the DEP to Major substantive rulemaking to modernize the State's regulatory process for metallic mineral mining.

On December 28, 2017, Chapter 200 was repealed and replaced by the current Chapter 200.

The new rules update Maine's mining regulations to provide Department oversight of exploration, and a comprehensive application and permitting process for advanced exploration, and mining. Permit applications for metallic mineral mining will be processed in accordance with the Maine Metallic Mineral Mining Act and Chapter 200 rules. In the event of conflicting statutory and rule requirements, the statute will control. Currently there are two metallic mineral exploration activity locations in the state. No applications for advanced exploration or mining permits have been received or approved as of October, 2021.

Gravel Pits and Quarries

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Related Website: www.maine.gov/dep/land/mining/index.html

The Performance Standards were created as a streamlined approach to regulating mineral excavations in the organized towns of the state. Qualifying excavations are registered with DEP through a simple notification process, called “Notice of Intent to Comply” (NOITC). To date, DEP has licensed 915 mining sites through the notification process. Once a NOITC has been filed, the licensee is responsible for operating the pit in compliance with the Performance Standards. The registration system also includes a variance process, which is a more formal permitting process that requires the submission of an application to the Department. It provides an opportunity to vary from the specific statutory performance standards contained in 38 M.R.S. § 490-D (Performance Standards for Excavations) and 38 M.R.S. § 490-Z (Performance Standards for Quarries). This legislation states that variances may only be granted where explicitly allowed. Some of the variance allowed include excavation below the water table, excavating closer than 100 feet to a public road, operating an externally drained pit, and operating an area greater than 10 acres for the working pit. Each type of variance application requires a different set of submissions to the Department. For example, excavation below the water table requires a hydrogeological study that includes one year of baseline monitoring for groundwater level and quality. In addition, ongoing monitoring of groundwater is required as a permit condition of operation to excavate sand and gravel or rock from below the water table. The Department has issued approximately 206 variances, with 93 issued for excavation below the water table.

CHAPTER 7 PUBLIC HEALTH-RELATED ASSESSMENTS

MAINE HEALTHY BEACHES PROGRAM

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Related Websites: (Maine-specific) mainehealthybeaches.org

(Federal) www.epa.gov/beaches

The Maine Healthy Beaches (MHB) program monitors designated coastal, marine beaches to notify the public of recreational water quality conditions. From 2010-2018 , the program was managed jointly by the Maine Department of Environmental Protection (ME DEP) and the University of Maine Cooperative Extension (UMaine Extension). Since January 1, 2019, MHB has been managed solely by the ME DEP.

EPA initiated the Beaches Environmental Assessment, Closure and Health (BEACH) Act of 2000 in response to the growing concern about public health risks posed by polluted coastal swimming beaches. MHB is a voluntary program and includes these components: water quality assessment and public notification of beach status, education and outreach, and working with communities and program partners to identify and remediate pollution sources through applied research and special studies.

All towns/parks participating in the MHB program conduct routine monitoring of *Enterococcus* bacteria to assess beach water quality from Memorial Day through Labor Day. When exceedances of safety criteria occur, all efforts are made to resample at those sites. In Maine, the monitoring of public access beaches and notification of beach status is the responsibility of the municipality and participation in the MHB program is voluntary. Private beach owners are responsible for their own monitoring programs unless they choose to work with the local municipality and MHB. The beaches participating in the MHB program are listed in Table 7-1. Note that the list of beaches may vary from year to year.

The assessment of designated beaches includes measurement of critical factors that affect the health of the beach environment to determine the likely sources impacting surf-zone water quality.

According to the 2014 National Beach Guidance and Required Performance Criteria for Grants, states receiving grants for coastal beach monitoring and public notification were required to select a new beach action value (BAV; single sample safety threshold for contamination advisories) or provide justification for an alternative. As part of the process, MHB convened a Technical Advisory Committee and conducted extensive data analysis of 10 years of data (2006-2015). As a result, Maine submitted a justification (approved by US EPA) to retain 104 MPN/100 mL as the State's BAV for enterococci in marine waters.

Table 7-1 Beaches Participating in MHB Program for any year between 2013 and 2020

Managing Organization	Beach Names
Acadia National Park	Sand Beach
Town of Bar Harbor	Hadley Point, Hulls Cove, Town Beach
City of Biddeford	Fortunes Rocks Beach, Gil Bouche Park/Biddeford Pool, Middle Beach (Biddeford)
Town of Bristol	Pemaquid Beach
Town of Camden	Laite Beach
Crescent Beach State Park	Crescent Beach, Kettle Cove Beach
Town of Cumberland	Broad Cove Reserve
Ferry Beach State Park	Ferry Beach (Saco)
Town of Freeport	Winslow Park
Town of Harpswell	Mackerel Cove, Mitchell Field Beach, Stover's Point Preserve
Higgins Beach Association	Higgins Beach
Hills Beach Association	Hills Beach
Town of Kennebunk	Goochs Beach, Libby Cove Beach, Middle Beach, Mother's Beach
Town Kennebunkport	Colony Beach, Goose Rocks[15]
Town of Kittery	Crescent Beach (Kittery), Fort Foster, Sea Point Beach
Town of Lincolnville	Lincolnville Beach Area
Town of Ogunquit	Footbridge (Ogunquit), Little Beach, Main (Ogunquit), Moody (Ogunquit), Riverside (Ogunquit)
Town of Old Orchard Beach	OOB - Central, OOB - North End, OOB - Ocean Park
Popham Beach State Park	Popham - Center Beach, Popham - East Beach, Popham - West Beach/Morse River
City of Portland	East End Beach
Reid State Park	East Beach, Half Mile Beach, Lagoon Beach, Mile Beach
City of Rockland	Sandy Beach
Town of Rockport	Goodies Beach
City of Saco	Bay View, Kinney Shores
Town of Scarborough	Ferry Beach (Scarborough), Pine Point
Scarborough Beach State Park	Scarborough Beach
City of South Portland	Willard Beach
Town of Wells	Casino Square, Crescent Beach (Wells), Drakes Isl. Beach, Wells Beach, Wells Harbor
Wells National Estuarine Research Reserve	Laudholm Beach
Town of York	Cape Neddick Beach, Long Sands Beach North, Long Sands Beach South, Short Sands Beach, York Harbor Beach

[15] Goose Rocks Beach was split into three beach management areas (Goose Rocks Beach - Batson River, Goose Rocks Beach - Little River, Goose Rocks Beach - Main Beach prior to the 2021 monitoring season.

Swimming Beach Advisories and Closures

Under Clean Water Act (CWA) guidelines, the designated use of swimming beaches is "recreation in and on the water" (i.e. Primary Contact Recreation). Maine has a Beach Action Value (BAV) for enterococci that is used as a single sample safety threshold (104 MPN/100 mL) for contamination advisories at designated coastal marine beaches. For beaches participating in the MHB program, the local municipality may issue beach actions including advisories (Contamination or precautionary rainfall) and closures. These actions are then posted as notifications to warn of potential health risks. Beach actions are based on a risk analysis performed by the beach manager with assistance from MHB staff. Contamination advisories represent those issued in response to elevated bacteria results, i.e. exceedances of the BAV of 104 enterococci MPN/100 mL, while precautionary rainfall advisories are issued pre-emptively based on local precipitation levels. Closures are rarely issued, and generally only based on the knowledge of a direct source, such as a sewage spill. These advisories/closures are recommendations to the public to avoid water contact activities at the beach until further analyses reveal safe conditions and/or conditions at the monitoring site change.

Table 7-2 shows the percent exceedances of Maine's BAV for all participating beaches in a given monitoring year, i.e. the percent of water quality samples that trigger a contamination advisory recommendation. The information in this summary table is different from that used to make assessment decisions regarding the impaired status of a beach. The methodology for those assessments is explained above under 'Data Interpretation, Bacteria' (pages 50-53) with background information provided under 'Coastal, Marine Beach Recreational Water Quality Monitoring' (page 99).

Table 7-2 Percent exceedances of Maine's BAV for 2013-2020 monitoring seasons.
Maine's enterococci BAV is 104 MPN/100 mL. '-' means no monitoring took place.

Beach Name	% Exceedances							
	2013	2014	2015	2016	2017	2018	2019	2020
Bay View	**17.6**	**13.3**	0	0	0	0	0	0
Broad Cove Reserve	-	-	-	0	0	**16.7**	0	**14.3**
Cape Neddick Beach	**26.3**	**13.3**	**17.6**	**18.8**	**7.1**	**13.3**	**18.8**	**30.8**
Casino Square	**19.4**	0	0	0	0	0	0	0
Colony Beach	**27.8**	**18.8**	**12.5**	**6.3**	**7.1**	**16.0**	**7.4**	0
Crescent Beach	**6.5**	0	**11.8**	0	0	0	0	0
Crescent Beach (Kittery)	0	**6.7**	**7.1**	**13.3**	**7.1**	0	**7.1**	**9.1**
Crescent Beach (Wells)	0	0	**6.7**	0	0	0	0	0
Drakes Isl Beach	**21.2**	**3.6**	**6.9**	0	**4.0**	0	**3.7**	0
East End Beach	**23.8**	**9.5**	**15.0**	**7.7**	0	**11.5**	**11.1**	**13.6**
Ferry Beach (Saco)	**11.8**	0	**7.7**	**7.1**	0	0	0	0
Ferry Beach (Scarborough)	**7.1**	**21.4**	**13.3**	**6.3**	**7.1**	**16.7**	**7.1**	-
Footbridge (Ogunquit)	0	0	0	**6.3**	0	0	0	0
Fort Foster - Horn Point	0	0	**7.1**	0	0	0	0	0
Fort Foster - Pier Beach	0	0	0	0	**14.3**	0	0	0
Fort Foster - Scuba Beach	0	0	**7.7**	0	0	0	0	0
Fortunes Rocks Beach	0	0	0	0	0	0	0	0
Gil Bouche Park-Biddeford Pool	0	0	**18.8**	0	0	0	0	0

Beach Name	% Exceedances							
	2013	2014	2015	2016	2017	2018	2019	2020
Goochs Beach	**30.0**	**17.6**	**14.3**	**9.7**	**4.2**	**12.1**	**3.8**	**7.4**
Goodies Beach	**38.1**	**31.3**	**22.2**	**11.8**	0	0	**7.1**	**6.7**
Goose Rocks[16]	**26.6**	**14.5**	**18.0**	**13.5**	**13.0**	**18.3**	**11.5**	**30.7**
Hadley Point	**6.7**	**11.8**	**7.1**	0	0	0	0	0
Half Mile Beach	0	0	0	0	0	0	0	0
Higgins Beach	**13.0**	0	**12.2**	**4.4**	0	0	**7.1**	**8.1**
Hills Beach	**9.1**	0	**6.7**	0	0	0	0	**14.3**
Hulls Cove	**6.7**	**11.8**	0	0	0	0	**6.3**	0
Kettle Cove Beach	**7.1**	0	**6.3**	**7.1**	**7.7**	0	0	**15.4**
Kinney Shores	**26.3**	**12.5**	**12.5**	0	0	0	0	**8.3**
Lagoon Beach	0	0	0	0	**25.0**	0	0	0
Laite Beach	**22.2**	**33.3**	**23.5**	**6.3**	0	0	0	**23.5**
Laudholm Beach	**14.3**	0	0	**6.3**	0	**6.9**	**10.3**	**9.5**
Lincolnville Beach	**11.8**	**18.8**	**17.6**	**11.8**	**13.3**	**31.3**	**7.7**	**22.2**
Little Beach	0	**27.3**	**6.7**	**11.8**	0	**15.4**	**13.3**	**41.2**
Long Sands Beach - North	**10.8**	**15.5**	**17.0**	**2.2**	**2.3**	**6.5**	**2.3**	**9.3**
Long Sands Beach - South	**3.8**	0	**2.4**	0	0	**2.7**	**5.3**	0
Mackerel Cove	-	-	-	-	-	**30.8**	0	**20.0**
Main (Ogunquit)	0	**12.5**	**12.5**	**6.3**	0	0	0	**21.4**
Middle Beach (Biddeford)	0	0	0	0	0	0	0	0
Mile Beach	0	0	0	0	0	0	0	0
Mitchell Field Beach	**-**	**-**	**-**	-	**-**	0	**7.1**	**6.7**
Moody (Ogunquit)	0	0	0	0	0	0	0	**8.3**
Mothers Beach	**21.1**	**17.6**	**9.7**	0	**7.7**	**13.3**	0	**7.7**
OOB - Central	**8.2**	**4.3**	**2.3**	0	**4.9**	**2.5**	0	**2.9**
OOB - North End	**6.3**	0	0	0	0	0	0	0
OOB - Ocean Park	**31.6**	**6.3**	**3.4**	**12.1**	0	**7.1**	0	0
Pemaquid Beach	0	0	**23.1**	0	0	0	0	0
Pine Point	**7.1**	**7.1**	**6.7**	0	0	0	0	-
Popham - Center Beach	0	0	0	0	0	0	0	0
Popham - East Beach	0	0	0	0	0	0	0	0
Popham - West Beach-Morse River	**3.7**	0	0	**4.0**	0	0	0	0
Riverside (Ogunquit)	0	**20**	**17.6**	**11.8**	0	**28.6**	**33.3**	**47.4**
Sand Beach	**12.9**	**11.8**	**3.2**	**6.7**	0	0	0	**3.7**
Sandy Beach	**6.3**	0	**6.7**	**11.8**	0	**7.1**	**13.3**	0
Scarborough Beach	0	0	0	**4.8**	0	0	0	0
Sea Point Beach	0	0	**7.1**	0	**7.1**	0	0	0
Seal Harbor	**6.7**	**7.1**	0	**11.8**	0	0	0	0
Short Sands Beach	**30**	**6.7**	**6.7**	0	0	0	**13.3**	0
Stover's Point Preserve	**-**	**-**	-	-	-	0	0	0
Town Beach	**3.3**	**3.2**	0	0	0	**7.1**	0	0
Wells Beach	**10.2**	**8.7**	**8.9**	0	0	0	0	0

[16] Goose Rocks Beach was split into three beach management areas (Goose Rocks Beach - Batson River, Goose Rocks Beach - Little River, Goose Rocks Beach - Main Beach prior to the 2021 monitoring season.

Beach Name	% Exceedances							
	2013	2014	2015	2016	2017	2018	2019	2020
Wells Harbor	**47.6**	**23.5**	0	**6.3**	0	**7.1**	**13.3**	0
Willard Beach	**18.5**	**22.2**	**33.3**	**10.7**	**4.0**	**19.2**	0	**25.0**
Winslow Park	0	0	0	-	-	-	-	-
York Harbor Beach	**6.3**	**13.3**	**6.7**	**12.5**	**7.7**	**7.1**	**7.1**	0
Number of Beaches with Exceedances	38	31	39	28	17	22	22	25
Total Yearly % Exceedances	13.1	8.1	8.6	5.0	2.7	6.7	4.6	9.4

SHELLFISH GROWING AREA CLASSIFICATION PROGRAM

Shellfish Harvest Area Closures

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Related Website: www.maine.gov/dmr/shellfish-sanitation-management/programs/growingareas/index.html

The DMR assesses information within shellfish growing areas to ensure that harvested molluscan shellfish are safe for consumption. A goal of the CWA is to have these areas meet their designated use of shellfish harvesting. Shellfish areas are closed by the DMR if the area is found to have elevated levels of fecal coliform bacteria or if the area is determined to be threatened by potential sewage pollution problems due to proximity of wastewater outfalls or intense storm runoff events. Classified areas are monitored regularly by collection of water samples throughout the year, and less frequently, by shoreline sanitary surveys to identify actual and potential pollution sources that may impact water quality. Monitoring and shoreline surveys ensure that growing areas are either properly classified.

For closure information, call the DMR's hotline at 1-800-232-4733, 207-624-7727 or visit www.maine.gov/dmr/shellfish-sanitation-management/closures/index.html.

Marine Biotoxin Closures

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Related Website: https://www.maine.gov/dmr/shellfish-sanitation-management/programs/biotoxinmonitoring.html

Toxins produced by some microscopic marine algae can be transferred to humans by the ingestion of shellfish that have filtered the organisms into their systems. The toxins can affect humans by paralyzing the central nervous system, causing headaches,

dizziness, nausea, digestive upset, cardiac arrhythmias or, in high doses, resulting in death. The DMR's Biotoxin Monitoring Program assesses levels of marine biotoxins, including those that cause Paralytic ("red tide"), Amnesic, and Diarrhetic Shellfish Poisonings. Shellfish samples are collected statewide, predominantly from March through October, and evaluated at the DMR laboratories in West Boothbay Harbor and Lamoine, and also at the Bigelow Laboratory for Ocean Sciences. When toxins are found in concentrations approaching quarantine levels, closures of shellfish harvest areas are implemented. Maine has historically exhibited high levels of the Paralytic Shellfish Poisoning-causing biotoxin during the warmer periods of the year, while the species that cause Amnesic Shellfish Poisoning may bloom more often during winter months. While the occurrence of red tide and other biotoxin events can be related to water quality conditions, a direct cause and effect relationship between these events and anthropogenically-caused pollution has not been established. Closures, therefore, are not reported as violations of water quality standards.

For closure information, call the DMR's hotline at 1-800-232-4733, 207-624-7727 or visit www.maine.gov/dmr/shellfish-sanitation-management/closures/index.html.

Ocean Fish and Shellfish Consumption Monitoring, Assessment and Advisories

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Related Website: www.maine.gov/dhhs/mecdc/environmental-health/eohp/

DEP monitors ocean fish and shellfish in its Surface Waters Ambient Toxics (SWAT) monitoring program for contaminants that may present a risk for human consumption. The results are forwarded to the Maine CDC, which is responsible for assessing any health threats from the consumption of anadromous and freshwater fish, and shellfish caught by noncommercial anglers in state waters. (22 M.R.S. §1696-I). The Maine CDC does this in the form of Fish Consumption Advisories (www.maine.gov/dhhs/mecdc/environmental-health/eohp/fish/2kfca.htm). Waters fail to attain their "CWA-designated use for Fishing" whenever government agencies issue fish and/or shellfish consumption advisories. These advisories are designed to let citizens know that there may be an increased risk to their health if they choose to consume certain species of fish or shellfish. Since 1992, human health consumption advisories have been in place to warn the public against the consumption of lobster tomalley. An advisory was issued for striped bass and bluefish in 1996 and revised in June 2009. The entire Maine coast (in waters naturally capable of supporting lobster propagation and harvest) is not in attainment of its designated use for fishing due to these consumption advisories. Further details are provided below.

Specific Ocean Fish Consumption Advisories

Striped Bass and Bluefish: Pregnant and nursing women, women who may get pregnant, nursing mothers and children under 8 years of age should not eat any striped bass or bluefish. All other individuals should eat no more than 4 meals per year.

(www.maine.gov/dhhs/mecdc/environmental-health/eohp/fish/documents/stripedbass.pdf)

The striped bass and bluefish consumption advisory was first issued in 1996 due to the presence of elevated PCBs in these two species. The consumption advice was updated in 2009 following an interstate workgroup evaluation of PCBs levels in recreationally caught striped bass and blue fish (www.maine.gov/dhhs/mecdc/environmental-health/eohp/fish/documents/9-08final.pdf).

Lobster Tomalley Consumption Advisories

Lobster Tomalley: No consumption. While there are no known safety considerations when it comes to eating lobster meat, consumers are advised to refrain from eating the tomalley. The tomalley is the soft, green substance found in the body cavity of the lobster that functions as the liver and pancreas. Test results have shown that the tomalley can accumulate contaminants found in the environment, including chemical contaminants, such as dioxins and biotoxins that are responsible for acute shellfish poisoning cases. Toxic contamination found in lobster tomalley is presumed to originate in Maine waters, which has resulted in their listing in Category 5-D for non-attainment due to legacy pollutants. The U.S. Food and Drug Administration (FDA) has similar lobster tomalley advisories, as do some other parts of New England such as Massachusetts and New Hampshire. Lobster meat remains safe to eat.

Safe Eating Guidelines and the Maine Family Fish Guide

In addition to issuing fish consumption advisories for recreational anglers, the Maine CDC maintains safe eating guidelines for both commercially available saltwater fish and shellfish and freshwater fish consumption. This guidance is generally consistent with FDA and EPA guidelines on commercial fish consumption. The Maine Family Fish Guide produced by the Maine CDC summarizes the safe eating guidelines for both saltwater and freshwater. The guide is available on the Maine CDC website and is sent out to OBGYN offices in the state. www.maine.gov/dhhs/mecdc/environmental-health/eohp/fish/documents/meffguide.pdf

Freshwater Fish Consumption Monitoring, Assessments and Advisories

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Related Website: www.maine.gov/dep/water/monitoring/toxics/

Advisory contact: Andrew Smith, DHHS, Maine CDC, Division of Environmental and Community Health, Environmental and Occupational Health Program

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Related Website: www.maine.gov/dhhs/mecdc/environmental-health/eohp/

In addition to ocean fish and shellfish, DEP also monitors freshwater fish in its SWAT monitoring program for contaminants that may present a risk for human consumption. The results are shared with the Maine CDC for the purpose of Fish Consumption Advisories (www.maine.gov/dhhs/mecdc/environmental-health/eohp/fish/2kfca.htm). See the preceding section for more information. There is a statewide Fish Consumption Advisory for all freshwaters due to mercury, and additional chemical-specific advisories for specific waters in the state.

Mercury Statewide Fish Consumption Advisory

Pregnant and nursing women, women who may get pregnant, and children under age 8 SHOULD NOT EAT any freshwater fish from Maine's inland waters. Except, for brook trout and landlocked salmon, 1 meal per month is safe.

All other adults and children older than 8 CAN EAT 2 freshwater fish meals per month. For brook trout and landlocked salmon, the limit is 1 meal per week.

Based on monitoring of mercury concentrations in freshwater fish from lakes and rivers in Maine, the Maine CDC issued a statewide advisory for all Maine lakes and ponds in 1994, expanded it to include all freshwaters in 1997, and revised in 2000.

Chemical-specific River and Stream Fish Consumption Advisories

Androscoggin River Gilead to Merrymeeting Bay:---------- **6-12** fish meals a year.
Dennys River Meddybemps Lake to Dead Stream:---------- **1-2** fish meals a month.
Green Pond, Chapman Pit, & Greenlaw Brook
(Limestone):---------- **Do not eat any fish from these waters**.
Little Madawaska River & tributaries
(Madawaska Dam to Grimes Mill Road):-------**Do not eat any fish from these waters**.
Kennebec River Augusta to the Chops:-------- **Do not eat any fish from these waters**.
Shawmut Dam, Fairfield to Augusta:--**5** trout meals a year, 1-2 bass meals a month.
Madison to Fairfield: ---------- **1-2** fish meals a month.
Meduxnekeag River: ---------- **2** fish meals a month.
North Branch Presque Isle River*---------- **2** fish meals a month.
Penobscot River below Lincoln:---------- **1-2** fish meals a month.
Prestile Stream:---------- **1** fish meal a month.
Red Brook in Scarborough: ---------- **6** fish meals a year.
Salmon Falls River below Berwick: ---------- **6-12** fish meals a year.
Sebasticook River (East Branch, West Branch & Main Stem)
(Corinna/Hartland to Winslow):----------**2** fish meals a month.

* Correct name is North Branch Presque Isle Stream

The river and stream fish consumption advisories are due to the elevated levels of dioxin/furans/coplanar PCBs, total PCBs, and total DDTs (DDD + DDE + DDT) (www.maine.gov/dhhs/mecdc/environmental-health/eohp/fish/2kfca.htm). These advisories were last updated in 2009. The Maine CDC is currently reviewing the most recent dioxin, PCB and DDT fish tissue contaminant data from DEP to assess the need

to collect more data and/or revise or update the above river and stream fish consumption advisories.

Dioxin Monitoring

The most recent (2009) evaluation by the Maine CDC of dioxins and furans in fish from Maine rivers is available here: www.maine.gov/dhhs/mecdc/environmental-health/eohp/fish/documents/finaldraft-eval-of-pcdd.pdf. Sampling results from 2011-2014 showed that dioxin levels in fish from Maine rivers continued to decline, approaching background levels at some locations but still exceeding that level at others. In 2013, concentrations exceeded the Maine CDC's Fish Tissue Action Level (FTAL) at all four stations monitored on the Androscoggin River from Gilead to Lisbon, but were below the FTAL in the Penobscot River at Milford and the Kennebec River in Augusta. In 2014, when the last sampling for dioxin occurred, concentrations in filet and roe of American shad from Waterville on the Kennebec River were at the FTAL. Dioxin monitoring is conducted at the request of the Maine CDC to inform the fish consumption advisories. Maine CDC expects to review current data and future needs by 2022.

PerFluoroAlkyl Substances (PFAS) Monitoring

To assess background concentrations of PFAS in fish, in 2014 DEP collected three species of sport fish from each of three lakes or ponds, which receive no direct discharges of pollutants and analyzed for PFAS compounds. The results were that concentrations of most PFAS compounds were undetected or barely detected. PFOS (PerFlouroOctaneSulfonate) was detected, but only at concentrations (1-4.7 ng/g) well below the Maine CDC's 2018 site-specific FTAL for recreational anglers (34.1 ng/g; Interdepartmental Memo dated April 26, 2018 on PFOS fish tissue levels in Durepo Reservoir and Limestone Stream). In 2015 and 2016, sport fish collected from five rivers below POTWs were analyzed for PFAS. PFOS was the most commonly detected and was well below the FTAL in most rivers, but was slightly above (40 ng/g) the FTAL in two species of fish from the Mousam River below the Sanford POTW in two successive years. In 2019 and 2020, PFOS was again the most commonly detected compound in fish tissue. In 2019, levels were well below the FTAL in all samples collected from four rivers, but elevated at three locations each below industrial sources on the Androscoggin and Kennebec Rivers. In 2020, levels were well below the FTAL in samples collected from three lakes and three rivers, with the levels in the East Branch and mainstem Penobscot River and St. Croix River being very low and near background levels. However, fish from Estes Lake below the Sanford wastewater treatment plant (WWTP; 38.9 and 38.0 ng/g) and one location on the Presumpscot River below a paper mill and WWTP (35.7 ng/g) were above the FTAL. Maine DEP has a dedicated PFAS webpage (www.maine.gov/dep/spills/topics/pfas/) where more information and sampling results are available.

GROUNDWATER AND PUBLIC HEALTH CONCERNS

Public Health and Environmental Concerns

Contaminants found in groundwater can have numerous adverse human health and environmental impacts. Public health concerns arise because some contaminants have been individually linked to toxic effects ranging from allergic reactions and respiratory impairment to liver and kidney damage, and damage to the central nervous system. Additional public health concerns also arise because information is not available about potential health impacts of many contaminants found in groundwater.

Due to uncertainties regarding the relationship between exposure to contaminants and impacts on human health, public health efforts are based on identifying the probabilities of impacts (i.e. risk assessment). Conducting risk assessments for combinations of contaminants that are commonly found in groundwater is difficult because there are no generally accepted protocols for testing for such effects. The primary route of exposure to contaminants is through ingestion of drinking water, although exposure is also possible through contact with skin and inhalation of vapors from groundwater sources (bathing, food preparation, industrial processes, etc.)

Because groundwater generally provides base flow to streams and rivers, environmental impacts include toxic effects on benthic invertebrates, fish, wildlife and aquatic vegetation. This also presents a public health concern if the surface waterbody is a source of food or recreation. In some areas of the State there are probably links between low-level, long-term groundwater quality degradation and the water quality of streams and brooks during low-flow conditions.

Drinking Water Programs and Groundwater Contaminant Assessments

WELLHEAD PROTECTION PROGRAM

Contact: Susan Breau, DHHS, CDC, Division of Environmental and Community Health (DEH), Drinking Water Program (DWP)

Tel: (207) 592-6981 Email: Susan.Breau@maine.gov

Related Website: www.maine.gov/dhhs/mecdc/environmental-health/dwp/

The Maine CDC Drinking Water Program (DWP), located in DHHS, administers the Wellhead Protection Program (WHPP). The WHPP continues to be a voluntary program for Maine's public water suppliers, with all reduced or waived monitoring tied to approved protection programs. To be eligible for reduced or waived monitoring, a system must have an approved local Wellhead Protection Plan and the owner or operator must complete a waiver application.

SOURCE WATER ASSESSMENT AND PROTECTION PROGRAM

Contact: Susan Breau, DHHS, CDC, DEH, DWP

Tel: (207) 592-6981 Email: Susan.Breau@maine.gov

Related Website: www.maine.gov/dhhs/mecdc/environmental-health/dwp/pws/swp.shtml

Water supply protection is the first line of defense in protecting public health and has long been recognized as the cornerstone of providing safe drinking water. The most

effective source protection method is to keep the area contributing water to the supply open and undeveloped. The DWP's past assessments of source protection for public water supplies identified rapid residential and commercial development in source protection areas as the most significant threat to water quality and quantity.

Public Water Systems (PWSs) have a limited suite of tools for source protection: they can purchase land, inspect existing activities, and ask local government to enact (and enforce) protective ordinances. The DWP continues to collaborate with systems to assess the risk to drinking water sources, and to encourage PWSs to establish source water protection programs.

FINISHED WATERS

Contact: Susan Breau, DHHS, CDC, DEH, DWP

Tel: (207) 592-6981 Email: Susan.Breau@maine.gov

Related Websites:

www.maine.gov/dhhs/mecdc/environmental-health/dwp/index.shtml and

www.maine.gov/dhhs/mecdc/environmental-health/dwp/pws/swp.shtml

The DWP is the frontline enforcement agent in Maine for the rules and regulations set forth in the Federal Safe Drinking Water Act (SDWA). The requirements of the SDWA apply to the approximately 1,900 public drinking water systems in Maine. There are approximately 70 water systems that use surface water as their primary source, and these all have water treatment systems and watershed protection programs. Of the approximately 1,800 groundwater systems, approximately 1,000 have some form of treatment on-line (and this number is likely to continue to rise), while the remaining systems have no treatment and serve raw water. Water quality testing is the primary means for assessing public water system compliance, while also verifying the health and safety of the water that is reaching consumers.

PRIVATE WELLS

Contact Haig Brochu, DHHS, CDC, DEH, DWP

Tel: (207) 592.3190 Email: Haig.Brochu@maine.gov

Related Websites: www.maine.gov/dhhs/mecdc/environmental-health/dwp/consumers/waterWellFacts.shtml and

www.maine.gov/dhhs/mecdc/environmental-health/eohp/wells/

Maine has one of the highest per capita uses of domestic household wells for drinking water in the U.S. Based on data from Maine's 2017 Behavioral Risk Factors Surveillance Survey (BRFSS), approximately 52% of Maine homes rely on a private well for their drinking water.

PERFLUOROALKYL AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Contact: Alex Pugh, DHHS, CDC, DEH, DWP

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Related Website: www.maine.gov/dhhs/mecdc/environmental-health/dwp/pws/pfas.shtml

The DWP has partnered with the Maine Department of Environmental Protection (DEP) and others to perform three rounds of PFAS testing statewide in select high priority

areas in Maine. In March of 2019, Governor Janet Mills issued an executive order to create a PFAS Task Force, which completed its Final Report in January of 2020. The report included recommendations regarding statewide PFAS testing for some public water systems, determination of a Maximum Contaminant Level (MCL) for some PFAS compounds in public drinking water, private well testing and continued testing for PFAS statewide in the environment. *(Important update occurring after the current reporting period: With the signing of LD 129 on June 21, 2021, all community public water systems and non-transient, non-community schools and child care facilities in Maine are required to sample finished drinking water for PFAS by December 31, 2022. An interim standard of 20 ppt for six PFAS (alone or in combination) is in effect. See DWP PFAS website above FMI.)*

RADON

Contact: Jonathan Dyer, DHHS, CDC, DEH, Radiation Control Program – Radon Program

Tel: (207) 287-5743 Email: Jonathan.Dyer@maine.gov or radon.dhhs@maine.gov

Related Website: www.maine.gov/dhhs/mecdc/environmental-health/rad/radon/hp-radon.htm

The presence of naturally-occurring radioactive radon gas in groundwater from granite bedrock aquifers and overlying soils has long been recognized as a problem in Maine. A large number of Maine wells have radon concentrations that, through normal household water use, release radon into the air resulting in concentrations that may cause an increased incidence of lung cancer.

The average water radon level in Maine is approximately 11,000 picocuries/Liter (pCi/L). The Maine State Toxicologist set a maximum exposure guideline (MEG) of 4,000 pCi/L for radon in water effective January 1, 2007. DWP uses this MEG when evaluating new community water systems and new non-transient, non-community water systems. Community water systems in Maine must install treatment above this level. For private wells with radon concentrations between 4,000 and 10,000 pCi/L, the Toxicologist recommends investigation of the total radon risk (water and air). For private wells with radon concentrations of 10,000 pCi/L or higher in water, reducing the radon in water is recommended regardless of the radon in air concentration.

ARSENIC

Contact: Ryan P. Gordon, Hydrogeologist, DAFC, MGS

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Related Website: www.maine.gov/dhhs/mecdc/environmental-health/eohp/wells/index.htm

Several types of cancer, including skin and bladder cancer, along with other health problems have been linked to the presence of arsenic in drinking water. The current Maximum Contaminant Level (MCL) for arsenic is 10 ppb (parts per billion) in drinking water. A 2010 study by the USGS, in cooperation with the MCDC, reviewed nearly 14,000 well water analyses statewide, and determined that more than 25% of the wells sampled in 44 towns had arsenic concentrations in excess of 10 ppb. However, because these wells were self-selected by the homeowners for analysis, it is likely that the data are biased toward higher arsenic concentrations. It is likely that 10-15% of wells statewide have arsenic concentrations in excess of the MCL. Additional work by

the MGS, Columbia University, and the USGS on potential sources of arsenic in well water in central Maine strongly suggests that the local metamorphic bedrock is a significant source. However, potential anthropogenic sources cannot be ruled out in some areas.

CHAPTER 8 SUMMARY OF IMPAIRED WATERS

OVERVIEW

Chapter 8 contains four sets of tables and each table is presented for each waterbody type assessed (rivers/streams, lakes/ponds, wetlands, estuarine/marine waters, coastal designated beaches). The four sets are: 1) New Listings (Table 8- 1 to Table 8- 5); 2) New Delistings (Table 4- 6 to Table 4- 9); 3) Status of Delisted Category 5 Waters (Table 8- 10 to Table 8- 13); and 4) TMDL Current Project Update (Table 8- 14 to Table 8- 18). For each item listed below, also see the related record in Appendices II-V as additional information may be presented there.

NEW LISTINGS

Table 8- 1 New Rivers/Streams Listings

This table provides a list of new impairments (Category 5 listings) as well as one new AU that was added in another, non-impaired category; the term 'listings' is therefore used in a general sense here.. See the 'Comments' column for more information. A '0' in column 'Category, 2016' indicates that the AU was not listed in that cycle for that cause. '2022' is used as a shorthand for the current 2018/2020/2022 cycle. Abbreviations used in column 'Category, Other 2022' in this table are as follows: A/P, (Algae) Periphyton (Aufwuchs) Indicator Bioassessments; DO, Dissolved Oxygen; Habitat Assessment, HA; MI, Benthic Macroinvertebrates Bioassessments.

Assessment Unit ID	Segment Name	Location	Cause	Category			Comments
				2016	2022	Other 2022	
ME0101000303_123R01	North Fork McLean Brook	St Agatha, tributary to Fish River via Long Lake	Benthic Macroinvertebrates Bioassessments	3	5-A	5-A (MI)	11/29/21: Moved from Category 3 to 5-A in 2018/2020/2022 cycle for Aquatic Life Use: macroinvertebrates did not attain Class B at biomonitoring station S-922 in 2009 and 2019; algae (periphyton) did not attain in 2009, 2014 and 2019.
ME0101000303_123R01	North Fork McLean Brook	St Agatha, tributary to Fish River via Long Lake	Periphyton (Aufwuchs) Indicator Bioassessments	3	5-A	5-A (A/P)	
ME0101000412_140R05	Kennedy Brook (Presque Isle)	Tributary to Presque Isle Stream	Dissolved Oxygen	0	5-A	4-A (A/P)	9/24/2021: New Category 5-A listing in 2022 cycle for aquatic life use due to dissolved oxygen impairment - 2018 continuous monitoring data showed extensive exceedance of IR assessment

Assessment Unit ID	Segment Name	Location	Cause	Category			Comments
				2016	2022	Other 2022	
							guidelines. Impairment covered under Statewide NPS TMDL addendum, cause delisted to Category 4-A in 2022 cycle.
ME0101000412_141R01	Birch Brook (Presque Isle)	Tributary to Aroostook River	Periphyton (Aufwuchs) Indicator Bioassessments	0	5-A	None	10/23/21: New Category 5-A listing in 2018/2020/2022 cycle for Aquatic Life Use: algae (periphyton) did not attain Class B at biomonitoring station S-1019 in 2014 and 2019.
ME0101000412_143R03	Hockenhull Brook (Ft. Fairfield)	Tributary to Aroostook River	None	0	3	None	10/23/21: New Category 3 listing in 2018/2020/2022 cycle for Aquatic Life Use: algae (periphyton) did not attain Class B at biomonitoring station S-1026 in 2014 and 2019. Improvement in conditions between 2014 and 2019, resampling needed to confirm whether impairment exists.
ME0101000412_143R04	Cowett Brook (Ft. Fairfield)	Tributary to Aroostook River	Benthic Macroinvertebrates Bioassessments	0	5-A	5-A (A/P)	10/23/21: New Category 5-A listing in 2018/2020/2022 cycle for Aquatic Life Use: benthic macroinvertebrates and algae (periphyton) did not attain Class B at biomonitoring station S-1021 in 2014 and 2019.
ME0101000412_143R04	Cowett Brook (Ft. Fairfield)	Tributary to Aroostook River	Periphyton (Aufwuchs) Indicator Bioassessments	0	5-A	5-A (MI)	
ME0101000412_143R05	Unnamed Brook (Presque Isle)	Tributary to Aroostook River (at Parkhurst)	Periphyton (Aufwuchs) Indicator Bioassessments	0	5-A	None	10/23/21: New Category 5-A listing in 2018/2020/2022 cycle for Aquatic Life Use: algae (periphyton) did not attain Class B at biomonitoring station S-1027 in 2014 and 2019.
ME0101000413_144R01	Amsden Brook (Ft. Fairfield)	Tributary to Aroostook River	Dissolved Oxygen	0	5-A	5-A (AP)	10/23/21: New Category 5-A listing in 2018/2020/2022 cycle for Aquatic Life Use: algae (periphyton) did not attain Class B at biomonitoring station S-1018 in

Assessment Unit ID	Segment Name	Location	Cause	Category			Comments
				2016	2022	Other 2022	
ME0101000413_144R01	Amsden Brook (Ft. Fairfield)	Tributary to Aroostook River	Periphyton (Aufwuchs) Indicator Bioassessments	0	5-A	5-A (DO)	2014 and 2019, and 2016-2018 continuous monitoring data for dissolved oxygen showed extensive exceedance of IR assessment guidelines.
ME0101000413_144R02	Hacker Brook (Ft. Fairfield)	Tributary to Aroostook River	Periphyton (Aufwuchs) Indicator Bioassessments	0	5-A	None	10/23/21: New Category 5-A listing in 2018/2020/2022 cycle for Aquatic Life Use: algae (periphyton) did not attain Class B at biomonitoring station S-1024 in 2014 and 2019.
ME0101000413_144R03	Gray Brook (Ft. Fairfield)	Tributary to Aroostook River	Periphyton (Aufwuchs) Indicator Bioassessments	0	5-A	None	10/23/21: New Category 5-A listing in 2018/2020/2022 cycle for Aquatic Life Use: algae (periphyton) did not attain Class B at biomonitoring station S-1023 in 2014 and 2019.
ME0101000501_150R02	Rocky Brook	Mars Hill, tributary to Prestile Stream	Periphyton (Aufwuchs) Indicator Bioassessments	3	5-A	None	11/16/21: New Category 5-A listing in 2018/2020/2022 cycle for Aquatic Life Use: algae (periphyton) did not attain Class B at biomonitoring station S-375 in 2004, 2009, 2014 and 2019.
ME0101000504_152R02	Craig Brook	Including North and South Branches; tributaries to Meduxnekeag River, Littleton	Periphyton (Aufwuchs) Indicator Bioassessments	0	5-A	None	9/17/21: New Category 5-A listing in 2022 cycle for Aquatic Life Use due to algae (periphyton) non-attainment of Class B standards (2013, 2014 and 2017 at biomonitoring station S-1006). Impairment covered under Statewide NPS TMDL addendum, cause delisted to Category 4-A in 2022 cycle.
ME0101000504_152R03	Oliver Brook	Including tributaries; tributaries to Meduxnekeag River	Periphyton (Aufwuchs) Indicator Bioassessments	0	5-A	None	11/16/21: New Category 5-A listing in 2022 cycle for Aquatic Life Use: algae (periphyton) did not attain Class B at

Assessment Unit ID	Segment Name	Location	Cause	Category			Comments
				2016	2022	Other 2022	
							biomonitoring station S-1005 in 2013, 2014 and 2019.
ME0101000504_152R04	Smith Brook and tributaries (Houlton)	Tributaries to Meduxnekeag River (waters in Maine)	Periphyton (Aufwuchs) Indicator Bioassessments	0	5-A	None	12/20/21: New Category 5-A listing in 2022 cycle for Aquatic Life Use: algae (periphyton) did not attain Class B at biomonitoring station S-1007 in 2013, 2014, 2017 and 2019.
ME0102000510_224R05	Capehart (Pushaw) Brook (Bangor)	Tributary to Kenduskeag Stream	Benthic Macroinvertebrates Bioassessments	0	5-A	4-A (HA)	11/9/21: New Category 5-A listing in 2022 cycle for aquatic life use due to macroinvertebrate non-attainment of Class B standards in 2013 (biomonitoring station S-311) and 2014 (S-311 and S-1044). Impairment covered under Statewide % Impervious Cover TMDL, cause delisted to Category 4-A in 2022 cycle.
ME0104000208_413R07	Gully Brook (Auburn)	Tributary to Androscoggin River	Benthic Macroinvertebrates Bioassessments	0	5-A	5-A (DO, A/P), 4-A (E. coli)	9/21/21: New Category 5-A listing in 2022 cycle for Aquatic Life Use: macroinvertebrates and algae (periphyton) do not attain Class B at biomonitoring station S-695.
ME0104000208_413R07	Gully Brook (Auburn)	Tributary to Androscoggin River	Periphyton (Aufwuchs) Indicator Bioassessments	0	5-A	5-A (DO, MI), 4-A (E. coli)	
ME0104000210_419R03	Unnamed Stream (Lewiston Municipal Landfill)	Biomon Sta 857 affected by Lewiston Municipal Landfill near Plourde Pky	Periphyton (Aufwuchs) Indicator Bioassessments	0	5-A	5-A (MI)	12/28/21: New Category 5-A listing in 2018/2020/2022 cycle for Aquatic Life Use: algae (periphyton) did not attain Class B at biomonitoring station S-857 in 2008, 2013 and 2018.
ME0105000305_528R05	Meadow Bk (China)	Tributary to West Branch Sheepscot River	Escherichia coli	0	5-A	4-A (DO)	12/30/21: New Category 5-A listing in 2018/2020/2022 cycle for recreation use: E. coli exceeded Class B criteria in 2013-2019.
ME0105000305_528R07	Choate Bk (Windsor)	Tributary to West Branch Sheepscot River	Escherichia coli	0	5-A	4-A (DO)	12/30/21: New Category 5-A listing in 2018/2020/2022 cycle for recreation use: E. coli exceeded Class A criteria in 2013-2018.

Assessment Unit ID	Segment Name	Location	Cause	Category			Comments
				2016	2022	Other 2022	
ME0105000305_528R08_01	Chamberlain Bk (Whitefield)	Tributary to Sheepscot River	Escherichia coli	0	5-A	4-A (DO)	12/30/21: New Category 5-A listing in 2018/2020/2022 cycle for recreation use: E. coli exceeded Class B criteria in 2013-2018.
ME0106000105_610R07	Red Brook (Scarborough, S Portland)	Tributary to Long Creek	Benthic Macroinvertebrates Bioassessments	0	5-A	4-A (HA), 5-D (PCBs)	11/9/21: New Category 4-A listing in 2018/2020/2022 cycle for aquatic life use due to macroinvertebrate impairment – 2010, 2015 and 2020 biological monitoring data at biomonitoring stations S-219, S-412 and S-413 showed that the community did not meet Class B aquatic life criteria. Impairment covered under Statewide % Impervious Cover TMDL, cause delisted to Category 4-A in 2022 cycle
ME0106000106_616R04	Bear Bk	Saco, tributary to Goosefare Brook	Benthic Macroinvertebrates Bioassessments	0	5-A	5-A (HA) 4-A (E. coli)	10/20/21: New Category 5-A listing in 2022 cycle for Aquatic Life Use: macroinvertebrates did not attain Class B at biomonitoring station S-1041 in 2014 and 2015. Habitat degraded.
ME0106000106_616R04	Bear Bk	Saco, tributary to Goosefare Brook	Habitat Assessment	0	5-A	5-A (MI) 4-A (E. coli)	

Table 8- 2 New Lakes/Ponds Listings

HUC		Lake Name	Lake ID	Impaired Use	Category		Other Listing Categories having Lakes within this HUC	Comments
					2016	2022		
ME	0102000401	Otter Pond	7142	Aquatic Life Support	1	4-C	1, 2	Pollution from legacy sawdust deposits impairing habitat
ME	0102000513	Alamoosook Lake	4336	Aquatic Life Support	2	5-A	2	Declining trophic trend due to hatchery discharge

Table 8- 3 New Wetlands Listings

This table provides a list of new impairments (Category 5 listings) as well as new AUs that were added in other, non-impaired categories; the term 'listings' is therefore used in a general sense here. A '0' in column 'Category, 2016' indicates that the AU was not listed in that year for that cause. '2022' is used as a shorthand for the current 2018/2020/2022 cycle.

Assessment Unit ID	Segment Name	Location	Cause	Category			Comments
				2016	2022	Other 2022	
ME0101000501_150R01_W198	Robinson Dam Pond wetlands	Blaine, Wetland station W-198	Benthic Macroinvertebrates Bioassessments	3	5	None	New listing for Aquatic Life Use based on 2009, 2014 and 2019 biological monitoring data.
ME0104000210_418R02_W101	No Name Brook (Lewiston) wetland	Wetlands along No Name Brook in Lewiston, includes biomonitoring station W-101 and W-102	Benthic Macroinvertebrates Bioassessments	3	5	None	New listing for Aquatic Life Use based on 2002, 2016 and 2017 biological monitoring data.
ME0101000303_1806_W254	Germain Lake wetlands	Madawaska, wetland station W-254	Benthic Macroinvertebrates Bioassessments	0	3	None	New listing for Aquatic Life Use based on 2014 and 2019 biological monitoring data.
ME0101000412_1776_210	Echo Lake wetlands	Presque Isle, wetland station W-210	Benthic Macroinvertebrates Bioassessments	0	3	None	New listing for Aquatic Life Use based on 2014 and 2019 biological monitoring data.
ME0103000306_314R02_W242	Cold Brook Pond	Skowhegan, wetland station W-242	Benthic Macroinvertebrates Bioassessments	0	3	None	New listing for Aquatic Life Use based on 2012 and 2017 biological monitoring data.
ME0103000308_5479_W079	Corundel Lake wetlands	wetlands in and around Corundel Lake, Corinna, wetland station W-079	Benthic Macroinvertebrates Bioassessments	0	3	None	New listing for Aquatic Life Use based on 2002, 2012 and 2017 biological monitoring data.

Assessment Unit ID	Segment Name	Location	Cause	Category			Comments
				2016	2022	Other 2022	
ME0103000320_0041_W070	Carlton Bog	Northern basin, Wetland station W-070	Benthic Macroinvertebrates Bioassessments	2	3	None	New listing for Aquatic Life Use based on 2002, 2016 and 2017 biological monitoring data.
ME0103000320_0041_W250	Carlton Bog (eastern basin)	eastern basin, Wetland station W-250, Troy	Benthic Macroinvertebrates Bioassessments	0	3	None	New listing for Aquatic Life Use based on 2012, 2016 and 2017 biological monitoring data.
ME0103000322_5280_W076	Messalonskee Lake wetlands	Belgrade	Benthic Macroinvertebrates Bioassessments	2	3	None	New listing for Aquatic Life Use based on 2002, 2016 and 2017 biological monitoring data.
ME0105000218_4828_W145	Goose River (Upper Mason Pond)	Belfast, Wetland Station W-145	Benthic Macroinvertebrates Bioassessments	0	3	None	New listing for Aquatic Life Use based on 2006, 2011 and 2016 biological monitoring data.
ME0105000304_5382_W161	Clary Lake	Whitefield, wetland station W-161	Benthic Macroinvertebrates Bioassessments	2	3	None	New listing for Aquatic Life Use based on 2007 and 2017 biological monitoring data.
ME0106000102_603R_W035	Shaker Bog	Wetland Station W-035	Benthic Macroinvertebrates Bioassessments	0	3	None	New listing for Aquatic Life Use based on 2005, 2010 and 2015 biological monitoring data.
ME0106000106_5648_W128	Great Pond (Cape Elizabeth)	Wetland site W-128	Benthic Macroinvertebrates Bioassessments	0	3	None	New listing for Aquatic Life Use based on 2005, 2010 and 2015 biological monitoring data.
ME0103000314_314R03_W249	East Branch Wesserunsett Stream wetlands	Athens, wetland station W-249	Benthic Macroinvertebrates Bioassessments	0	2	None	New listing for Aquatic Life Use based on 2012 and 2017 biological monitoring data.
ME0106000302_3864_W052	Stump Pond (Sanford)	Wetland station W-052	Benthic Macroinvertebrates Bioassessments	0	2	None	New listing for Aquatic Life Use based on 2010 and 2015 biological monitoring data.

Table 8- 4 New Estuarine/Marine Waters Listings

As all estuarine and marine AUs were newly delineated in the current cycle (See Estuarine and Marine Waters, Summary of Statewide Status, pages 96-97), and a crosswalk between historic Waterbody IDs and new AUs has not yet been developed, it is not possible to say which of the 88 waters included in Category 5-B-1 for the shellfish harvest designated use are completely new as opposed to being carried forward from the 2016 Report (in part or in their entirety). However, because most shellfish impairments

in the 2016 Report were located in Category 5-B-1 (a-c), it is highly likely that the great majority of the 2022 waters in Category 5-B-1 were previously listed in the same category and are therefore not new listings. In the interest of brevity, these Category 5-B-1 waters in question are not listed here but can be found in Table 8- 13 below and Appendix V.

Assessment Unit ID	Segment Name	Location	Cause	Category		Comments
				2016	2022	
						No new estuarine/marine waters added in 2022.

Table 8- 5. New Coastal Designated Beaches Listings

Coastal designated beaches are listed for the first time in this report (see Ch. 4, 'Coastal, Marine Beach Recreational Water Quality Monitoring', page 106 above). This table provides a list of new impairments (Category 5 listings) as well as new AUs that were added in other, non-impaired categories; the term 'listings' is therefore used in a general sense here. '2022' is used as a shorthand for the current 2018/2020/2022 cycle. Abbreviations used in column 'Category, Other 2022' in this table are as follows: FC, Fecal Coliform; UK, Unknown.

Assessment Unit ID	AU Name	Cause	Category		Comments
			2022	Other 2022	
ME010500021410_SB_209288B	Hulls Cove (Bar Harbor)	Enterococci	2	None	
ME010500021410_SB_419870B	Town Beach (Bar Harbor)	Enterococci	2	None	
ME010500021410_SB_806573B	Hadley Point (Bar Harbor)	Enterococci	2	None	
ME010500021509_SA_313199B	Sand Beach (Bar Harbor)	Enterococci	2	None	
ME010500021509_SB_280918B	Seal Harbor (Mount Desert)	Enterococci	2	None	
ME010500021909_SB_309187B	Laite Beach (Camden)	Enterococci	2	None	
ME010500021909_SB_315104B	Goodies Beach (Rockport)	Enterococci	2	None	

Assessment Unit ID	AU Name	Cause	Category		Comments
			2022	Other 2022	
ME010500021909_SB_386772B	Lincolnville Beach (Lincolnville)	Enterococci	3	None	New Category 3 listing for Recreation in the water Use based on 2016-2020 Enterococci bacteria monitoring data.
ME010500021909_SC_997054B	Sandy Beach (Rockland)	Enterococci	2	None	
ME010500030307_SB_601876B	Pemaquid Beach (Bristol)	Enterococci	2	None	
ME010500030503_SA_202939B	Lagoon Beach (Georgetown)	Enterococci	2	None	
ME010500030504_SA_202937B	Mile Beach (Georgetown)	Enterococci	2	None	
ME010500030504_SA_202938B	Half Mile Beach (Georgetown)	Enterococci	2	None	
ME010500030606_SA_340149B	Popham - East Beach (Phippsburg)	Enterococci	2	None	
ME010500030606_SA_416997B	Popham - Center Beach (Phippsburg)	Enterococci	2	None	
ME010500030606_SA_641636B	Popham - West Beach-Morse River (Phippsburg)	Enterococci	2	None	
ME010600010505_SB_275080B	Ferry Beach (Scarborough)	Enterococci	2	None	
ME010600010507_SB_141922B	Hills Beach (Biddeford)	Enterococci	2	None	
ME010600010507_SB_187302B	Crescent Beach (Cape Elizabeth)	Enterococci	2	5-B-1 (FC)	Category 5-B-1 Shellfish Harvest Designated Use impairment due to elevated fecal coliforms for ME010600010507_SB_WH_CAE.
ME010600010507_SB_226383B	Higgins Beach (Scarborough)	Enterococci	2	None	
ME010600010507_SB_389456B	Ferry Beach (Saco)	Enterococci	2	None	

Assessment Unit ID	AU Name	Cause	Category		Comments
			2022	Other 2022	
ME010600010507_SB_399101B	Kettle Cove Beach (Cape Elizabeth)	Enterococci	2	5-B-1 (FC)	Category 5-B-1 Shellfish Harvest Designated Use impairment due to elevated fecal coliforms for ME010600010507_SB_WH_CAE.
ME010600010507_SB_417497B	OOB – Central (Old Orchard Beach)	Enterococci	2	None	
ME010600010507_SB_428165B	Scarborough Beach (Scarborough)	Enterococci	2	None	
ME010600010507_SB_529749B	Bay View (Saco)	Enterococci	2	None	
ME010600010507_SB_681861B	OOB - North End (Old Orchard Beach)	Enterococci	2	None	
ME010600010507_SB_713616B	OOB - Ocean Park (Old Orchard Beach)	Enterococci	2	None	
ME010600010507_SB_721564B	Kinney Shores (Saco)	Enterococci	2	None	
ME010600010507_SB_800164B	Pine Point (Scarborough)	Enterococci	2	None	
ME010600010605_SB_159520B	Mackerel Cove (Harpswell)	Enterococci	2	None	
ME010600010605_SB_316342B	Mitchell Field Beach (Harpswell)	Enterococci	2	None	
ME010600010605_SB_438327B	Broad Cove Reserve (Cumberland)	Enterococci	2	None	
ME010600010605_SB_692469B	Stovers Point Preserve (Harpswell)	Enterococci	2	None	
ME010600010605_SB_875929B	Willard Beach (South Portland)	Enterococci	3	None	New Category 3 listing for Recreation in the water Use based on 2016-2020 Enterococci bacteria monitoring data.
ME010600010605_SC_712895B	East End Beach (Portland)	Enterococci	3	None	New Category 3 listing for Recreation in the water Use based on 2016-2020 Enterococci bacteria monitoring data.

Assessment Unit ID	AU Name	Cause	Category		Comments
			2022	Other 2022	
ME010600030104_SB_242175B	Goochs Beach (Kennebunk)	Enterococci	2	None	
ME010600030104_SB_548712B	Mothers Beach (Kennebunk)	Enterococci	2	None	
ME010600030104_SB_704305B	Colony Beach (Kennebunkport)	Enterococci	2	None	
ME010600030303_SB_345424B	Goose Rocks - Batson River (Kennebunkport)	Enterococci	5-B	None	New Category 5-B listing for Recreation in the water Use based on 2016-2020 Enterococci bacteria monitoring data.
ME010600030303_SB_400547B	Goose Rocks - Main Beach (Kennebunkport)	Enterococci	2	None	
ME010600030303_SB_458104B	Fortunes Rocks Beach (Biddeford)	Enterococci	2	None	
ME010600030303_SB_715925B	Middle Beach (Biddeford)	Enterococci	2	None	
ME010600030303_SB_793244B	Goose Rocks - Little River (Kennebunkport)	Enterococci	5-B	None	New Category 5-B listing for Recreation in the water Use based on 2016-2020 Enterococci bacteria monitoring data.
ME010600030303_SB_834829B	Gil Bouche Park-Biddeford Pool (Biddeford)	Enterococci	2	None	
ME010600031001_SB_286041B	Fort Foster - Pier Beach (Kittery)	Enterococci	2	5-A (UK)	Category 5-A Marine Life Use Support impairment for cause Unknown for ME010600031001_SB_02E.
ME010600031102_SB_191827B	Cape Neddick Beach (York)	Enterococci	3	None	New Category 3 listing for Recreation in the water Use based on 2016-2020 Enterococci bacteria monitoring data.
ME010600031102_SB_794778B	Riverside (Ogunquit)	Enterococci	5-B	None	New Category 5-B listing for Recreation in the water Use based on 2016-2020 Enterococci bacteria monitoring data.
ME010600031102_SB_844549B	Wells Harbor (Wells)	Enterococci	2	None	
ME010600031106_SA_225501B	Crescent Beach (Kittery)	Enterococci	2	None	

Assessment Unit ID	AU Name	Cause	Category		Comments
			2022	Other 2022	
ME010600031106_SA_946741B	Sea Point Beach (Kittery)	Enterococci	2	None	
ME010600031106_SB_101827B	Short Sands Beach (York)	Enterococci	2	None	
ME010600031106_SB_120281B	York Harbor Beach (York)	Enterococci	2	None	
ME010600031106_SB_149950B	Crescent Beach (Wells)	Enterococci	2	None	
ME010600031106_SB_213752B	Fort Foster - Scuba Beach (Kittery)	Enterococci	2	5-A (UK)	Category 5-A Marine Life Use Support impairment for cause Unknown for ME010600031001_SB_02E.
ME010600031106_SB_289576B	Drakes Island Beach (Wells)	Enterococci	2	None	
ME010600031106_SB_291639B	Wells Beach (Wells)	Enterococci	2	None	
ME010600031106_SB_339331B	Moody (Ogunquit)	Enterococci	2	None	
ME010600031106_SB_394456B	Little Beach (Ogunquit)	Enterococci	3	None	New Category 3 listing for Recreation in the water Use based on 2016-2020 Enterococci bacteria monitoring data.
ME010600031106_SB_461196B	Fort Foster - Horn Point (Kittery)	Enterococci	2	5-A (UK)	Category 5-A Marine Life Use Support impairment for cause Unknown for ME010600031001_SB_02E.
ME010600031106_SB_470693B	Long Sands Beach – North (York)	Enterococci	2	None	
ME010600031106_SB_673256B	Long Sands Beach – South (York)	Enterococci	2	None	
ME010600031106_SB_758563B	Laudholm Beach (Wells)	Enterococci	2	None	
ME010600031106_SB_796789B	Casino Square (Wells)	Enterococci	2	None	

Assessment Unit ID	AU Name	Cause	Category		Comments
			2022	Other 2022	
ME010600031106_SB_947608B	Main (Ogunquit)	Enterococci	2	None	
ME010600031106_SB_986577B	Footbridge (Ogunquit)	Enterococci	2	None	

NEW DELISTINGS

Table 8- 6 through Table 8- 9 present specific Causes of impairment that have been removed from the list of Impaired Waters [the"303(d) List"] for the specified waterbody segments. Refer to the "Delisting" section in Chapter 4 for an explanation of the delisting process. Segments may appear multiple times if multiple causes have been delisted. For each waterbody, the category change in the 2018/2020/2022 ('2022' for short) cycle for the noted Cause is presented as well as information on whether the waterbody is also listed in other categories. For AUs that were delisted for reasons other than TMDL approval, delisting information is presented below.

Delisting of Aquatic Life Use Impairments in Category 5-A Water to Category 2

MEDUXNEKEAG RIVER (HOULTON AND LITTLETON)

Meduxnekeag River, from biomonitoring station S-364 to border (ME0101000504_152R01_03) is a 7.2-mile segment of the river in Houlton and Littleton. This segment is listed as impaired in Category 5-D (Rivers and Streams Impaired by Legacy Pollutants) for DDT, Category 5-A for Periphyton (Aufwuchs) Indicator Bioassessments ('algae') and Category 4-A for Total Phosphorus (due to a TMDL approved on 3/8 /2001). The aquatic life use impairment for algae had been created in the 2014 cycle based on the algal community not meeting Class B narrative criteria at biomonitoring station S-1 in 2002, 2004 and 2011. However, algae had met Class B at station S-364, at the upstream boundary of the segment in question, in 2011 and 2014.

In the 2018/2020/2022 reporting cycle, DEP proposes to delist the Periphyton (Aufwuchs) Indicator Bioassessments cause of the aquatic life use impairment from Category 5-A to Category 2 due to attainment of Maine's narrative criteria for aquatic life use as indicated by biological assessments. [Maine's Class B water quality standards require that *"…receiving waters must be of sufficient*

quality to support all aquatic species indigenous to the receiving water without detrimental changes in the resident biological community." 38 M.R.S., Chapter 3, § 465(3)(C).] Other listings for this AU will remain unchanged.

Since the earlier bioassessments for algae noted above, a larger number of samples and an enhanced understanding of algal communities and their responses to environmental factors have improved assessment methods used by DEP's biological monitoring unit to determine whether biological communities meet applicable narrative aquatic life criteria. A re-analysis of the historic samples at station S-1 has changed the assessment results so now the community is assessed to have met Class B narrative criteria in 2004 and 2011; for 2002, the re-analysis confirmed non-attainment of Class B narrative criteria. Assessment results remained unchanged (Class B narrative criteria met) at station S-364 in 2011 and 2014. Both stations were most recently sampled in 2017, and again Class B criteria were met at both stations.

As a result of the re-analysis of earlier data and analysis of new (2017) data, DEP concludes that the Periphyton (Aufwuchs) Indicator Bioassessments impairment in the AU in question no longer exists and should be removed from Category 5-A and delisted to Category 2.

SANDY RIVER (FARMINGTON)

Sandy River in Farmington, main stem segment below Farmington wastewater treatment plant (WWTP, ME0103000305_319R_02) is a 3.24-mile, Class B segment of the River that is impaired for aquatic life use based on Benthic Macroinvertebrate (BMI) Bioassessments (since 2004 cycle) and Dissolved Oxygen (DO, since 2012 cycle). In the 2018/2020/2022 listing cycle, DEP proposes to delist the BMI Bioassessments cause of the aquatic life use impairment from Category 5-A to Category 2 due to attainment of Maine's criteria for aquatic life use, supported by biological assessments. At the same time, the DO cause is proposed to be delisted to Category 4-B, see below.

Maine's Class B water quality standards require that *"…receiving waters must be of sufficient quality to support all aquatic species indigenous to the receiving water without detrimental changes in the resident biological community."* 38 M.R.S., Chapter 3, § 465(3)(C). In addition, numeric criteria for BMI are provided in Maine rule chapter 579 (*Classification Attainment Evaluation Using Biological Criteria for Rivers and Streams, 06-096 CMR 579*).

In 1997 and 2000, MDEP staff found that the BMI community downstream from the Farmington WWTP did not meet applicable Class B aquatic life criteria due to a very high total abundance of organisms, indicating nutrient enrichment. The generic richness of EPT (Ephemeroptera, Plecoptera, Trichoptera) taxa, which are pollution-sensitive organisms, was low. High levels of total phosphorus (TP) in the WWTP discharge were identified as the primary source of the nutrients.

In 2007, when BMI were next sampled, they met the applicable Class B aquatic life criteria. In 2012 and 2017, they exceeded (i.e. were better than) the applicable aquatic life Class B criteria. Between 2000 and 2017, the total abundance of organisms decreased significantly, indicating a continuous reduction in nutrient enrichment. During the same period, the generic richness of EPT increased substantially, indicating an improvement in water quality.

The marked improvement in the BMI community indicates that the community has achieved the restoration goal for the Sandy River of meeting applicable aquatic life Class B criteria, i.e. it is no longer impaired. Therefore, the impairment cause Benthic Macroinvertebrates Bioassessments should be removed and the AU delisted to Category 2 for this cause. Total phosphorus discharge limits included in the 2017 wastewater discharge permit for the Farmington WWTP will ensure continued aquatic life criteria attainment of the BMI community, provided that no new stressors develop.

Listing of New Impairment Causes for Impaired Waters with Approved TMDLs (Category 4-A)

KENNEDY BROOK (PRESQUE ISLE)

Kennedy Brook in Presque Isle (ME0101000412_140R05) is a 3.2-mile Class B stream impaired for aquatic life use based on data from Periphyton (Aufwuchs) Indicator Bioassessments (i.e. 'algae'). Kennedy Brook was delisted from Category 5-A to 4-A in the 2018/2020/2022 reporting cycle due to a TMDL approved in 2021 for Total Phosphorus, Total Nitrogen and Sediment (TMDL # R1_ME_2021_02, approval date 9/23/21). The TMDL was designed to address water quality stressors associated with nonpoint source (NPS) runoff (nutrients and sediment) primarily from agricultural fields and also from development.

In the 2018/2020/2022 listing cycle, DEP proposes to list an additional aquatic life use impairment cause to Kennedy Brook due to a dissolved oxygen (DO) impairment. [Maine's Class B water quality standards require that *"the dissolved oxygen content … may not be less than 7 parts per million or 75% of saturation,...."* 38 M.R.S., Chapter 3, § 465(3)(B).] This impairment is based on continuous DO data collected in 2018 and assessed using new IR assessment guidelines (see Dissolved Oxygen, pages 53-56). The assessment showed the presence of exceedance events as well as duration, magnitude and diurnal swing exceedances.

The primary stressors causing DO exceedances in Kennedy Brook are excess nutrients (Total Phosphorus and Total Nitrogen) as well as sediment, most likely attributable to runoff from agricultural fields (58% of watershed) and developed land (25% with 13.3% impervious cover). The TMDL lists the implementation of a 2018 Watershed Based Plan, education/outreach actions (targeting landowners and citizens), further data analysis, implementation of best management practices (BMPs), and development or strengthening of local ordinances in its Next Steps recommendations to curb the identified NPS pollution. It is anticipated that the existing TMDL will address the recently identified DO impairment.

CAPEHART BROOK (BANGOR)

Capehart Brook in Bangor (ME0102000510_224R05) is a 0.46-mile Class B stream impaired for aquatic life use based on habitat assessment. The brook was delisted from Category 5-A to 4-A in the 2012 reporting cycle due to the approval in 2012 of Maine's Statewide % Impervious Cover TMDL (TMDL 42454, approval date 9/27/12). The TMDL was designed to address aquatic life and

habitat impairments in streams attributable to increased stormwater volume and pollutant loads originating from developed areas and associated impervious cover (IC).

In the 2018/2020/2022 listing cycle, DEP proposes to add a second aquatic life use impairment cause to Capehart Brook due to an impairment in the benthic macroinvertebrate (BMI) community. [Maine's Class B water quality standards require that *"…receiving waters must be of sufficient quality to support all aquatic species indigenous to the receiving water without detrimental changes in the resident biological community."* 38 M.R.S., Chapter 3, § 465(3)(C).] This impairment is based on BMI samples collected in 2013 (biomonitoring station S-311) and 2014 (S-311 and S-1044) which showed that the community did not meet applicable Class B aquatic life criteria.

The primary stressor causing the BMI impairment in Capehart Brook is urban runoff from development and associated IC (15% of watershed). When rain falls in developed areas, it flows quickly off these impervious surfaces, carrying dirt, oils, metals, nutrients, and other pollutants to the nearest stream. This combination of pollutants found in stormwater, including sediment and nutrients, is contributing to the BMI impairment in Capehart Brook, along with erosion, habitat loss and unstable stream banks caused by excessive amounts of runoff. The TMDL lists the installation of structural best management practices (BMPs) and application of non-structural BMPs, citizen involvement in the long term protection of the brook, and the development and/or strengthening of local stormwater control ordinances in its Next Steps recommendations to address the impact of IC. It is anticipated that the existing TMDL will address the identified BMI impairment.

RED BROOK (SCARBOROUGH, SOUTH PORTLAND)

Red Brook (Scarborough, S Portland) (ME0106000105_610R07) is a 5.4-mile Class B stream impaired for aquatic life use based on habitat assessment. The brook was delisted from Category 5-A to 4-A in the 2012 reporting cycle due to the approval in 2012 of Maine's Statewide % Impervious Cover TMDL (TMDL 42454, approval date 9/27/12). The TMDL was designed to address aquatic life and habitat impairments in streams attributable to increased stormwater volume and pollutant loads originating from developed areas and associated impervious cover (IC).

In the 2018/2020/2022 listing cycle, DEP proposes to add a second aquatic life use impairment cause to Red Brook due to an impairment in the benthic macroinvertebrate (BMI) community. [Maine's Class B water quality standards require that *"…receiving waters must be of sufficient quality to support all aquatic species indigenous to the receiving water without detrimental changes in the resident biological community."* 38 M.R.S., Chapter 3, § 465(3)(C).] This impairment is based on BMI samples collected at biomonitoring station S-219 in 2005, 2015 and 2020, S-412 in 2010, 2015 and 2020, and S-413 in 2010, which showed that the community did not meet applicable Class B aquatic life criteria.

The primary stressor causing the BMI impairment in Red Brook is urban runoff from development and associated IC (11% of watershed). When rain falls in developed areas, it flows quickly off these impervious surfaces, carrying dirt, oils, metals, nutrients, and other pollutants to the nearest stream. This combination of pollutants found in stormwater, including sediment and nutrients, is

contributing to the BMI impairment in Red Brook, along with erosion, habitat loss and unstable stream banks caused by excessive amounts of runoff. The TMDL lists the installation of structural best management practices (BMPs) and application of non-structural BMPs, citizen involvement in the long term protection of the brook, and the development and/or strengthening of local stormwater control ordinances in its Next Steps recommendations to address the impact of IC. It is anticipated that the existing TMDL will address the identified BMI impairment.

Delisting of Aquatic Life Use Impairment in Category 5-A Water to Category 4-B

SANDY RIVER (FARMINGTON)

Sandy River in Farmington, main stem segment below Farmington wastewater treatment plant (WWTP, ME0103000305_319R_02) is a 3.24-mile, Class B segment of the River that is impaired for aquatic life use based on Benthic Macroinvertebrate (BMI) Bioassessments (since 2004 cycle) and Dissolved Oxygen (DO, since 2012 cycle). In the 2018/2020/2022 listing cycle, DEP proposes to delist the DO cause of the aquatic life use impairment from Category 5-A to Category 4-B due to the implementation of a 4-B restoration approach (permit). At the same time, the BMI Bioassessments cause is proposed to be delisted to Category 2, see above.

Maine's Class B water quality standards require that *"The dissolved oxygen content of Class B waters may not be less than 7 parts per million or 75% of saturation, whichever is higher, except that for the period from October 1st to May 14th, in order to ensure spawning and egg incubation of indigenous fish species, the 7-day mean dissolved oxygen concentration may not be less than 9.5 parts per million and the one-day minimum dissolved oxygen concentration may not be less than 8.0 parts per million in identified fish spawning areas."* 38 M.R.S., Chapter 3, § 465(3)(B).

In 1997 and 2000, DEP staff found that the benthic macroinvertebrate (BMI) community downstream from the Farmington WWTP did not meet applicable Class B aquatic life criteria, likely due to nutrient enrichment. In 2015 and 2016, water quality sampling below the WWTP showed large diurnal swings of DO, also indicating nutrient enrichment. High levels of total phosphorus (TP) in the WWTP discharge were identified as the primary source of the nutrients.

Historic (2001, 2006, 2011) Maine Pollutant Discharge Elimination System (MEPDES) permits to the Town of Farmington for their WWTP did not contain any TP limits. In the most recent MEPDES permit issued in January 2017, a schedule of compliance was established to institute a seasonal (June 1 to September 30) monthly average water quality based TP limit beginning on June 1, 2021. The limit had been set to ensure that the discharge did not cause or contribute to documented water quality impacts downstream of the WWTP. Other standard requirements of a MEPDES permit (e.g. for a wet weather flow management plan and an Operations and Maintenance plan) were also included.

The Town of Farmington successfully implemented new technology to meet the TP permit limit by June 1, 2021. As part of the 2017 MEPDES permit requirements, the permittee must submit monthly Discharge Monitoring Reports (DMRs) with TP concentrations and loads for 6/1 through 9/30 of each year. Other seasonal or year-round effluent monitoring data not related to the discharge of TP must also be submitted, e.g. for 5-day biochemical oxygen demand, total suspended solids, settleable solids, pH, and temperature. Whole effluent testing must also be performed.

It is expected that water quality standards will be met by January 2022 (5 years after the effective date of the 2017 permit). DEP therefore proposes to delist this segment of the Sandy River to Category 4-B due to the implementation of 4-B restoration approach, i.e. a MEPDES permit.

Delisting of Shellfish Harvest Use Impairments in Category 5-B-1 to Category 3

MULTIPLE WATERBODIES

In the 2018/2020/2022 Report, DEP developed a new assessment and listing methodology for bacteria impairments (see Bacteria, pages 57-63). In the same cycle, DEP also implemented a new system for presenting impairments of estuarine and marine waters, which consisted of creating two separate groups of assessment units (AUs), one for the shellfish harvest designated use (SHDU) and one for all other designated uses (N-SHDU); for more information, see pages 96-97.

The new methodology incorporates specific EPA guidance (Grubbs and Wayland 2000, US EPA 2002) to assign SHDU waters that that are closed to shellfish harvest administratively due to lack of assessment or insufficient data to Category 3. A long-standing provision in Maine's methodology supports the same approach1. All other SHDU waters that are closed to shellfish harvest based on sufficient data on the quantity of Fecal Coliform bacteria are assigned to Category 5-B-1. In past cycles, all waters where shellfish harvest was limited for any duration, regardless of the reason (i.e., administrative or based on Fecal Coliform data), were listed in Category 5-B-12.

In the 2018/2020/2022 reporting cycle, DEP proposes to delist the Fecal Coliform cause of the SHDU impairment from Category 5-B-1 to Category 3 for 122 AUs (see Appendix V) that were closed to shellfish harvest administratively as determined by DMR as of 3/1/2021, the date on which impairment determinations are based for the current cycle. [Maine's Class SA and SB water quality standards (WQS) require that *"… waters must be of such quality that they are suitable for the designated uses of … propagation and harvesting of shellfish.*", 38 M.R.S., Chapter 3, § 465-B(1)(A) and 465-B(2)(A); Class SC WQS require that "*… waters must be of such quality that they are suitable for … propagation and restricted harvesting of shellfish.*", 38 M.R.S., Chapter 3, § 465-B(3)(A).

[1] Category 3: "Qualitative data or information from professional sources showing the potential presence of stressors that may cause impairment of one or more uses; however, no quantitative water quality information confirms the presence of impairment-causing stressors.", see page 44.
[2] In the 2014 and 2016 cycles, waters were assigned to three subcategories of Category 5-B-1, namely (a)-(c).

Furthermore, Class SB WQS require that "*…There may be no new discharge to Class SB waters that would cause closure of open shellfish areas by the Department of Marine Resources….*".]

These delistings will rectify the previous, incorrect assignment of waters closed to shellfish harvest administratively (i.e., due to lack of assessment or insufficient data) to Category 5-B-1. This approach was inconsistent with EPA guidance and a long-standing Category 3 listing description. The assignment of newly developed SHDU AUs to Category 3 is also consistent with the new assessment and listing methodology for bacteria impairments as developed for the current cycle. Therefore, these delistings will both correct erroneous historic listings and create correct current listings.

Table 8- 6 Rivers/Streams Delisted to Another Category

Abbreviations used in column 'Category, Other 2022' in this table are as follows: A/P, (Algae) Periphyton (Aufwuchs) Indicator Bioassessments; DO, Dissolved Oxygen; Ec, *Escherichia coli*; Habitat Assessment, HA; MI, Benthic Macroinvertebrates Bioassessments (Streams). Delisted waters that were included in Maine's implementation of EPA's 303(d) Vision are italicized. A '0' in column 'Category, 2016' indicates that the AU was not listed in that cycle for that cause. '2022' is used as a shorthand for the current 2018/2020/2022 cycle.

Assessment Unit ID	Segment Name	Location	Cause	Category			Reason for Removal	Delisting Comment
				2016	2022	Other 2022		
ME0101000412_140 R05	*Kennedy Brook (Presque Isle)*	*Tributary to Presque Isle Stream*	*Periphyton (Aufwuchs) Indicator Bioassessments*	*5-A*	*4-A*	*4-A (DO)*	*TMDL approved or established by EPA (4-A)*	*9/23/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum.*
ME0101000412_140 R05	Kennedy Brook (Presque Isle)	Tributary to Presque Isle Stream	Dissolved Oxygen	0	4-A	4-A (A/P)	TMDL approved or established by EPA (4-A)	10/13/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum (on 9/23/21).
ME0101000504_152 R01_03	Meduxnekeag River	From biomonitoring station S-364 to border	Periphyton (Aufwuchs) Indicator Bioassessments	5-A	2	4-A (TP), 5-D (DDT)	Applicable WQS attained; based on new data	12/3/2021: A re-analysis of historic data at S-1 indicates that algae met Class B narrative aquatic life criteria in 2004 and 2011; a 2017 sample also met Class B criteria.

Assessment Unit ID	Segment Name	Location	Cause	Category			Reason for Removal	Delisting Comment
				2016	2022	Other 2022		
ME0101000504_152 R02	Craig Brook	Including North and South Branches; tributaries to Meduxnekeag River, Littleton. All waters are unnamed in NHD.	Periphyton (Aufwuchs) Indicator Bioassessments	0	4-A	None	TMDL approved or established by EPA (4-A)	9/23/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum.
ME0102000510_224 R03	*French Stream (Exeter)*	*Tributary to Kenduskeag Stream*	*Benthic Macroinvertebrates Bioassessments*	*5-A*	*4-A*	*4-A (A/P)*	*TMDL approved or established by EPA (4-A)*	*9/23/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum.*
ME0102000510_224 R03	*French Stream (Exeter)*	*Tributary to Kenduskeag Stream*	*Periphyton (Aufwuchs) Indicator Bioassessments*	*5-A*	*4-A*	*4-A (MI)*	*TMDL approved or established by EPA (4-A)*	*9/23/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum.*
ME0102000510_224 R05	Capehart (Pushaw) Brook (Bangor)	Tributary to Kenduskeag Stream	Benthic Macroinvertebrates Bioassessments	0	4-A	4-A (HA)	TMDL approved or established by EPA (4-A)	11/9/2021: Aquatic life use impairment covered under Statewide % Impervious Cover TMDL (approved 9/27/12), moved to Category 4-A.
ME0103000305_319 R_02	*Sandy R,*	*Main stem, segment below Farmington WWTP*	*Benthic Macroinvertebrates Bioassessments*	*5-A*	*2*	*4-B (DO)*	*Applicable WQS attained, due to restoration activities*	*10/15/2021: Macroinvertebrates attained Class B in 2007, 2012 and 2017, delisted to Category 2.*
ME0103000305_319 R_02	*Sandy R,*	*Main stem, segment below Farmington WWTP*	*Dissolved Oxygen*	*5-A*	*4-B*	*2 (MI)*	*Other pollution control requirements (4b)*	*10/15/2021: 2017 MEPDES permit established seasonal (6/1 – 9/30) monthly average water quality based TP limit beginning 6/1/2021; expected to*

Assessment Unit ID	Segment Name	Location	Cause	Category			Reason for Removal	Delisting Comment
				2016	2022	Other 2022		
								address DO impairment by 2022.
ME0103000309_326 R02	Halfmoon Stream (Knox, Thorndike)	From Montville-Knox townline to Rt 220 bridge in Thorndike	Periphyton (Aufwuchs) Indicator Bioassessments	5-A	4-A	None	TMDL approved or established by EPA (4-A)	9/23/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum.
ME0103000309_326 R03	Halfmoon Stream (Thorndike, Unity)	From Rt 220 bridge in Thorndike to confluence with Sandy Stream	Periphyton (Aufwuchs) Indicator Bioassessments	5-A	4-A	None	TMDL approved or established by EPA (4-A)	9/23/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum.
ME0104000208_413 R03	*Stetson Brook (Lewiston)*	*Tributary to Androscoggin River*	*Dissolved Oxygen*	*5-A*	*4-A*	*4-A (Ec)*	*TMDL approved or established by EPA (4-A)*	*9/23/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum.*
ME0104000210_418 R02	*No Name Brook (Lewiston)*	*Tributary to Sabattus River*	*Dissolved Oxygen*	*5-A*	*4-A*	*4-A (Ec)*	*TMDL approved or established by EPA (4-A)*	*9/23/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum.*
ME0106000103_607 R01	*Black Brook (Windham)*	*Tributary to Presumpscot River*	*Dissolved Oxygen*	*5-A*	*4-A*	*5-A (Ec)*	*TMDL approved or established by EPA (4-A)*	*9/23/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum.*
ME0106000103_607 R03	*Colley Wright Brook (Windham)*	*Tributary to Presumpscot River*	*Dissolved Oxygen*	*5-A*	*4-A*	*4-A (Ec)*	*TMDL approved or established by EPA (4-A)*	*9/23/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum.*
ME0106000103_607 R07	*Inkhorn Brook (Westbrook)*	*Tributary to Presumpscot River*	*Dissolved Oxygen*	*5-A*	*4-A*	*4-A (Ec)*	*TMDL approved or established by EPA (4-A)*	*9/23/2021: Aquatic life use impairment moved to Category 4-A due to*

Assessment Unit ID	Segment Name	Location	Cause	Category			Reason for Removal	Delisting Comment
				2016	2022	Other 2022		
								approval of Statewide NPS TMDL addendum.
ME0106000103_607 R08	*Mosher Brook (Gorham)*	*Tributary to Presumpscot River*	*Dissolved Oxygen*	*5-A*	*4-A*	*5-A (Ec)*	*TMDL approved or established by EPA (4-A)*	*9/23/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum.*
ME0106000103_607 R09	*Otter Brook (Windham)*	*Tributary to Presumpscot River*	*Dissolved Oxygen*	*5-A*	*4-A*	*4-A (Ec)*	*TMDL approved or established by EPA (4-A)*	*9/23/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum.*
ME0106000103_607 R12	*Pleasant River (Windham)*	*Mainstem of Pleasant River from Thayer Brook to confluence with Presumpscot R*	*Dissolved Oxygen*	*5-A*	*4-A*	*4-A (Ec)*	*TMDL approved or established by EPA (4-A)*	*9/23/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum.*
ME0106000105_610 R07	Red Brook (Scarborough, S Portland)	Tributary to Long Creek	Benthic Macroinvertebrates Bioassessments	0	4-A	4-A (HA), 5-D (PCBs)	TMDL approved or established by EPA (4-A)	11/9/2021: Aquatic life use impairment covered under Statewide % Impervious Cover TMDL (approved 9/27/12), moved to Category 4-A.
ME0106000304_625 R01	*Adams Brook (Berwick)*	*Tributary to Lovers Brook and Great Works River*	*Benthic Macroinvertebrates Bioassessments*	*5-A*	*4-A*	*None*	*TMDL approved or established by EPA (4-A)*	*9/23/2021: Aquatic life use impairment moved to Category 4-A due to approval of Statewide NPS TMDL addendum.*

Table 8- 7 Lakes/Ponds Delisted to Another Category

HUC	Lake Name	Lake ID	Impaired Use	Category			Reason for Removal	Delisting Comment
				2016	2022	Other 2022		
								No Lakes/Ponds removed in 2022

Table 8- 8 Wetlands Delisted to Another Category

Assessment Unit ID	Segment Name	Location	Cause	Category			Reason for Removal	Delisting Comment
				2016	2022	Other 2022		
								No Wetlands removed in 2022

Table 8- 9 Estuarine/Marine Waters Delisted to Another Category

No waterbodies were delisted in the 2018/2020/2022 cycle for the non-shellfish harvest designated use, specifically for the Fish and Other Estuarine and Marine Life use. For the shellfish harvest designated use, it is likely that all 122 waterbodies in Category 3 are delistings from Category 5-B-1(a-c) in the 2016 cycle. However, because a crosswalk between historic and new AUs has not yet been developed, it is not possible to determine precisely which waters included in Category 3 for the shellfish harvest designated use are completely new as opposed to having been delisted from Category 5-B-1 in the 2016 Report, in part or in their entirety. In the interest of brevity, the Category 3 AUs in question are not listed here but can be found in in Table 8- 13 below and Appendix V. The 'Table 8- 9' terminology was retained for consistency with other waterbody types.

Assessment Unit ID	Segment Name	Location	Cause	Category		Reason for Removal	Delisting Comment
				2016	2022		
							See comment above.

STATUS OF DELISTED CATEGORY 5 WATERS

Table 8- 10 Status of Delisted Category 5 Rivers/Streams

This table presents the listing history (2002–2022) of Category 5 AUs that were delisted over time. Bold font indicates AU/Cause combinations that changed category during the 2022 cycle. Waters that are included in Maine's implementation of EPA's 303(d) Vision are indicated in italics. '2022' is used as a shorthand for the current 2018/2020/2022 cycle.

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'04-'08	'10 '22				ME0101000105_103 R01	Shields Branch of Big Black R	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02-'08	'10 '22				ME0101000121_117 R	St. John River at Madawaska	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02 '04	'06 - '22				ME0101000303_124 R01	Dickey Brook	Nutrient/Eutrophi-cation Biological Indicators	TMDL approved by EPA (4A) 9/28/2006	Submitted with Daigle Pond/Cross Pond TMDL in September 2006. EPA approved TMDL 9/28/06
'02 '04	'06 - '22				ME0101000303_124 R01	Dickey Brook	Dissolved Oxygen	TMDL approved by EPA (4A) 9/28/2006	
	'16-'22				ME0101000303_124 R01	Dickey Brook	Periphyton (Aufwuchs) Indicator Bioassessments	TMDL approved by EPA (4A) 9/15/2006	5/23/2012: New 5-A listing for Aquatic Life Use due to algae (periphyton) non-attainment (2003 and 2009, biomonitoring station 688); covered under existing TMDL, causes delisted to Category 4-A
'02 '04	'06 - '22				ME0101000303_124 R02	Daigle Brook	Nutrient/Eutrophi-cation Biological Indicators	TMDL approved by EPA (4A) 9/28/2006	Submitted with Daigle Pond/Cross Pond TMDL in September 2006. EPA approved TMDL 9/28/06
'02 '04	'06 - '22				ME0101000303_124 R02	Daigle Brook	Dissolved Oxygen		
'02		'04		'06-'22	ME0101000412_140 R01	No. Br. Presque Isle Stream between Mapleton and Presque Isle	BOD, Biochemical oxygen demand	State Determines water quality standard is being met (Category 2) 8/31/2006	Removal of Mapleton POTW complete. 2004 biomonitoring-showed attainment of Class A biocriteria and attains DO criteria at Station 11, 0.2 km downstream of Mapleton POTW
'02		'04		'06-'22	ME0101000412_140 R01	No. Br. Presque Isle Stream between Mapleton and Presque Isle	Dissolved oxygen		

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'04 -'08	'10 '22				ME0101000412_140 R02	Dudley Brook (Chapman)	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A)	EPA approved TMDL 4/26/2010 (for Total Phosphorus, Total Nitrogen and sediments)
'02 - '14	*'16 - '22*				*ME0101000412_143 R01*	*Everett Brook (Ft. Fairfield)*	*Dissolved Oxygen*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'12 - '14	*'22*		*'06 - '10*		*ME0101000412_143 R02*	*Merritt Brook*	*Benthic Macroinvertebrates Bioassessments*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'12 - '14	*'16 - '22*				*ME0101000412_143 R02*	*Merritt Brook*	*Periphyton (Aufwuchs) Indicator Bioassessments*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'02			'06 -'22		ME0101000413_142 R01	Caribou Stream	Benthic Macroinvertebrates Bioassessments	Flaws in original listing (Category 3) 10/2006	Administrative error, conflicting data Biocriteria non-attainment is inconsistent; segment was 5-A for non-attainment of biocriteria in 1994 only. Subsequent samples showed attainment; requires re-sampling
'12 - '16	***'22***				***ME0101000412_140 R05***	***Kennedy Brook (Presque Isle)***	***Periphyton (Aufwuchs) Indicator Bioassessments***	***TMDL approved or established by EPA (4A)***	***EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021***
'22	**'22**				**ME0101000412_140 R05**	**Kennedy Brook (Presque Isle)**	**Dissolved Oxygen**	**TMDL approved or established by EPA (4A)**	**EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021**
		'02- '22			ME0101000413_145 R01	Little Madawaska River	Polychlorinated biphenyls	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 3/15/2004	Haz waste remediation project is complete (Superfund)--expected to attain standards by 2020. Needs re-sampling to confirm
		'02- '22			ME0101000413_145 R02	Greenlaw Brook	Polychlorinated biphenyls	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 2002	9/6/2012: Corrected name, was Greenlaw Stream. Haz waste remediation project (Superfund)--expected to attain standards by 2020

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'04 - '08				'10 '22	ME0101000413_146 R01	Webster Brook	Escherichia coli	Applicable WQS attained; original basis for listing was incorrect	Monitoring for Statewide bacteria TMDL indicates this water attains bacteria standards
'12 - '14	*'16 - '22*				*ME0101000413_146 R02*	*Coloney Brook*	*Benthic Macroinvertebrates Bioassessments*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'12 - '14	*'22*				*ME0101000413_146 R02*	*Coloney Brook*	*Periphyton (Aufwuchs) Indicator Bioassessments*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'04 - '08	'10 - '22				ME0101000501_149 R01	Prestile Stream above dam in Mars Hill	Benthic Macroinvertebrates Bioassessments	EPA approval of TMDL 5/10/2010	EPA approval of TMDL (5/10/10), delisted to Category 4-A (macroinvertebrates, nutrients and DO).
'04 - '08	'10 - '22				ME0101000501_149 R01	Prestile Stream above dam in Mars Hill	Nutrient/Eutrophi-cation Biological Indicators		
'04 - '08	'10 - '22				ME0101000501_149 R01	Prestile Stream above dam in Mars Hill	Dissolved Oxygen		
'14 - '16				**'22**	**ME0101000504_152 R01_03**	**Meduxnekeag River**	**Periphyton (Aufwuchs) Indicator Bioassessments**	**Applicable WQS attained; based on new data**	**12/3/21: Cause delisted to Category 2 because applicable water quality standards are attained. Re-analysis of historic data indicates that algae met Class B narrative aquatic life criteria in 2004 and 2011; a 2017 sample also met Class B criteria.**
'22	**'22**				**ME0101000504_152 R02**	**Craig Brook**	**Periphyton (Aufwuchs) Indicator Bioassessments**	**TMDL approved or established by EPA (4A)**	**EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021**
		'10 - '22		'02- '08	ME0102000109_205 R01	West Branch Penobscot R main stem, below confluence with Millinocket Str	Dissolved Oxygen	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) May 2011	2011 permits providing nutrient limits are expected to correct existing aquatic life use impairments. Expected to attain in 2016.

Category by Report Year									
5	4-A	4-B	3	2	Assessment Unit ID	Water Name	Cause	Delisting Reason / Date	Comments
'02-'08	'10-'22				ME0102000110_205R03	Millinocket Stream (Millinocket)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'04-'08	'10-'22				ME0102000402_219R_02	Piscataquis River at Dover Foxcroft	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'04-'08	'10-'22				ME0102000403_215R_02	Sebec River at Milo	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02-'06				'08-'22	ME0102000403_215R01	Sebec River at Milo above confluence with Piscataquis R	Benthic Macroinvertebrates Bioassessments	Applicable WQS attained due to restoration activities	Previously listed in 5-A for biocriteria non-attainment based on 1985 data. This segment has been delisted: Resampling in 2006, at Biomonitoring Station 827, below the Milo Dam, shows attainment of Class A biocriteria.
'04				'02 '06-'22	ME0102000502_220R_01	Mattanawcook Stream (Lincoln)	Escherichia coli	State determines water quality standard is being met (Category 2)	CSO has been removed. Data from multiple sampling events collected by the Penobscot Indian Nation during summer 2004 for Mattanawcook Stream confirm attainment of numeric criteria for dissolved oxygen and bacteria. Segment is also Category 3 listed for sediment contamination; possible fish consumption impairment. Needs sampling to confirm
'04				'02 '06-'22	ME0102000502_220R_01	Mattanawcook Stream (Lincoln)	Dissolved Oxygen		
'02 '04				'06-'22	ME0102000502_230R	Penobscot R-(Mattawamkeag to Cambolasse)	Benthic Macroinvertebrates Bioassessments	Flaws in original listing of this cause (Category 2)	Administrative error, no data to support impaired biocriteria assessment. Erroneously listed for benthic macroinvertebrates prior to 2002 cycle.
'02-'10		'12-'22			ME0102000502_230R	Penobscot R-(Mattawamkeag to Cambolasse)	Nutrient/Eutrophi-cation Biological Indicators	Other point source or nonpoint source controls are expected	

Category by Report Year									
5	4-A	4-B	3	2	Assessment Unit ID	Water Name	Cause	Delisting Reason / Date	Comments
'02 - '10		'12- '22			ME0102000502_230 R	Penobscot R- (Mattawamkeag to Cambolasse)	Dissolved Oxygen	to meet water quality standards (Category 4B) May 2011	
'02 '04				'06- '22	ME0102000502_231 R	Penobscot R, main stem, from Cambolasse Str to Piscataquis R	Benthic Macroinvertebrates Bioassessments	Flaws in original listing of this cause (Category 2) 12/6/2006	Administrative error, no data to support impaired biocriteria assessment. Erroneously listed for benthic macroinvertebrates prior to 2002 cycle; has attained applicable biocriteria in 1992, 1993, 1994 and 1995.
'02 '04		'06- '22			ME0102000502_231 R	Penobscot R, main stem, from Cambolasse Str to Piscataquis R	Dioxin (including 2,3,7,8-TCDD)	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 8/1/2006	Dioxin controls in place and monitoring confirms improvement. Dioxin data from 2003 and 2005 showed no difference in fish above and below Lincoln.
'02 - '10		'12- '22			ME0102000502_231 R	Penobscot R, main stem, from Cambolasse Str to Piscataquis R	Nutrient/Eutrophi-cation Biological Indicators	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) May 2011	2011 permits providing nutrient limits are expected to correct existing aquatic life use impairments. Expected to attain in 2016.
'02 - '10		'12- '22			ME0102000502_231 R	Penobscot R, main stem, from Cambolasse Str to Piscataquis R	Dissolved Oxygen		
'04		'06- '22		'02	ME0102000503_221 R01	Cold Stream (Enfield) downstream of hatchery	Benthic Macroinvertebrates Bioassessments	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 6/20/2006	9/4/12: hatchery permit renewed 12/7/11; macroinvertebrates met Class A biocriteria in 2006 and 2011 (station S-484).
'02- '08	'10 - '22				ME0102000506_222 R01	Costigan Str (Costigan)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
‘04		‘06-‘22			ME0102000506_232R	Penobscot R	Dioxin (including 2,3,7,8-TCDD)	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 8/1/2006	Dioxin controls in place.
'10		'12-‘22			ME0102000506_232R	Penobscot R	Nutrient/Eutrophi-cation Biological Indicators	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) May 2011	2011 permits providing nutrient limits are expected to correct existing aquatic life use impairments. Expected to attain in 2016.
'10		'12-‘22			ME0102000506_232R	Penobscot R	Dissolved Oxygen		
'02-‘08	‘10 '22				ME0102000509_226R01	Otter Stream, Milford	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02-‘08	‘10			'12-‘22	ME0102000509_226R02	Boynton Brook	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Delisted to Category 2 due to newer monitoring data showing attainment of bacteria standards.
'04-'06		'08-'22			ME0102000509_233R_01	Penobscot R	Dioxin (including 2,3,7,8-TCDD)	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 2006	Dioxin controls in place.
'10		’12-‘22			ME0102000509_233R_01	Penobscot R	Nutrient/Eutrophi-cation Biological Indicators	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) May 2011	2011 permits providing nutrient limits are expected to correct existing aquatic life use impairments. Expected to attain in 2016.
'10		’12-‘22			ME0102000509_233R_01	Penobscot R	Dissolved Oxygen		
'02-‘08	’10 - '22				ME0102000509_233R_02	Penobscot River at Orono	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02-‘08	’10 - '22				ME0102000509_233R_03	Penobscot River at Old Town-Milford	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'02 - '14	*'22*				*ME0102000510_224 R01*	*Burnham Brook (Garland)*	*Dissolved Oxygen*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'02-'08	'10 - '22				ME0102000510_224 R02	Kenduskeag Stream	Escherichia coli	Applicable WQS attained; original basis for listing was incorrect	
'02 - '16	***'22***				***ME0102000510_224 R03***	***French Stream (Exeter)***	***Benthic Macroinvertebrates Bioassessments***	***TMDL approved or established by EPA (4A)***	***EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021.***
'10 - '16	***'22***				***ME0102000510_224 R03***	***French Stream (Exeter)***	***Periphyton (Aufwuchs) Indicator Bioassessments***		
'02 -'06	'08-'22				ME0102000510_224 R04	Birch Stream (Bangor)	Benthic Macroinvertebrates Bioassessments	TMDL approved by EPA (4A) 9/12/07	EPA approved TMDL 9/12/2007
	'12 - '22				ME0102000510_224 R04	Birch Stream (Bangor)	Periphyton (Aufwuchs) Indicator Bioassessments	TMDL approved by EPA (4A) 9/12/07	3/20/12: New 5A listing for Aquatic Life Use due to algae (periphyton) non-attainment (2001, 2003 and 2006, biomonitoring station 691); covered under existing TMDL, causes delisted to Category 4A
'22	**'22**				**ME0102000510_224 R05**	**Capehart (Pushaw) Brook (Bangor)**	**Benthic Macroinvertebrates Bioassessments**	**TMDL approved or established by EPA (4A) 9/27/12**	**11/9/2021: Aquatic life use impairment covered under Statewide % Impervious Cover TMDL (approved 9/27/12), moved to Category 4-A.**
'02 -'10	'12-'22				ME0102000510_224 R05	Capehart (Pushaw) Brook (Bangor)	Habitat Assessment	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'02 -'10	'12-'22				ME0102000510_224 R06	Arctic Brook (near Valley Ave, Bangor)	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'06 -'10	'12-'22				ME0102000510_224 R06	Arctic Brook (near Valley Ave, Bangor)	Habitat Assessment		

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'12 - '14	*'16 - '22*				*ME0102000510_224 R07*	*Crooked Brook, Corinth*	*Periphyton (Aufwuchs) Indicator Bioassessments*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'06 -'10	'12- '22				ME0102000511_225 R01_02	Shaw Brook (Bangor, Hampden)	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'02 -'10	'12- '22				ME0102000511_225 R01_02	Shaw Brook (Bangor, Hampden)	Habitat Assessment		
	'12- '22				ME0102000511_225 R01_02	Shaw Brook (Bangor, Hampden)	Periphyton (Aufwuchs) Indicator Bioassessments		
'04 -'10	'12- '22				ME0102000511_225 R02	Sucker Brook (Hampden) (formerly 'Unnamed St.-Hampden')	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'06 -'10	'12- '22				ME0102000511_225 R02	Sucker Brook (Hampden) (formerly 'Unnamed St.-Hampden')	Dissolved Oxygen		
		'10- '22		'02 -'08	ME0102000512_229 R	Penobscot R main stem, above Mattawamkeag R.	Nutrient/Eutrophi-cation Biological Indicators	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) May 2011	2011 permits providing nutrient limits are expected to correct existing aquatic life use impairments. Expected to attain in 2016.
		'10- '22		'02 -'08	ME0102000512_229 R	Penobscot R main stem, above Mattawamkeag R.	Dissolved Oxygen		
'02- '08	'10 - '22				ME0102000513_234 R	Penobscot River	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
		'02- '22			ME0102000513_234 R02	Penobscot	Dioxin (including 2,3,7,8-TCDD)	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B)	Dioxin controls in place.

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'10		’12-‘22			ME0102000513_234 R02	Penobscot	Nutrient/Eutrophi-cation Biological Indicators	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) May 2011	2011 permits providing nutrient limits are expected to correct existing aquatic life use impairments. Expected to attain in 2016.
'10		’12-‘22			ME0102000513_234 R02	Penobscot	Dissolved Oxygen		
‘02 '04		‘06-'22			ME0103000304_313 R01	Mill Stream (Embden)	Benthic Macroinvertebrates Bioassessments	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 6/20/2006	Hatchery permit issued 1/30/2006; exp. date 1/30/2011; other pollution controls are in place, attainment expected by 2009;
‘04		‘06-'22		‘02	ME0103000305_315 R_02	Unnamed Stream trib to Sandy R (Avon-Dunham Hatchery)	Benthic Macroinvertebrates Bioassessments	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 6/20/2006	Hatchery permit issued 10/18/2005; expiration date 10/18/10; hatchery is now closed; other pollution controls are in place, attainment expected by 2008;
’04 - ‘16				***‘22***	***ME0103000305_319 R_02***	***Sandy R,***	***Benthic Macroinvertebrates Bioassessments***	***Applicable WQS attained, due to restoration activities***	***Macroinvertebrates attained Class B in 2007, 2012 and 2017, delisted to Category 2.***
'12 - ‘16		***‘22***			***ME0103000305_319 R_02***	***Sandy R,***	***Dissolved Oxygen***	***Other pollution control requirements (4b) 1/18/17***	***2017 MEPDES permit established seasonal (6/1 – 9/30) monthly average water quality based TP limit beginning 6/1/2021; expected to address DO impairment by 2022.***
'02-‘08	’10 - '22				ME0103000306_320 R02	Currier Brook	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02-‘08	’10 - '22				ME0103000306_320 R03	Whitten Brook (Skowhegan)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
‘06 -'10	'12-‘22				ME0103000306_320 R03	Whitten Brook (Skowhegan)	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'04 -'10	'12-'22				ME0103000306_320R03	Whitten Brook (Skowhegan)	Habitat Assessment		
'02-'08	'10 - '22				ME0103000306_338R_02	Kennebec River at Skowhegan, CSO	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02-'08	'10 - '22				ME0103000306_339R_03	Kennebec River, near Fairfield	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	
		'02-'12		'16-'22	ME0103000308_325R01	East Branch Sebasticook River Corundel Pd to Sebasticook L (Corinna)	Benthic Macroinvertebrates Bioassessments	Applicable WQS attained; due to restoration activities	9/15/2014: Long-term monitoring data show criteria attainment for chlorinated benzenes and attainment of Class C aquatic life standards.
		'02-'12		'16-'22	ME0103000308_325R01	East Branch Sebasticook River, Corundel Pd to Sebasticook L (Corinna)	Benzene		
'02 - '14	*'16 - '22*				*ME0103000308_325 R02*	*Brackett Brook (Palmyra)*	*Dissolved Oxygen*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'02 - '14	*'16 - '22*				*ME0103000308_325 R03*	*Mulligan Stream (St. Albans)*	*Dissolved Oxygen*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'16 - '22		'06-'14			ME0103000308_331R01	Martin Stream (Dixmont)	Ammonia (Un-ionized)	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 7/13/2006	11/12/2014: CAFO ceased operation in late 2013; permit expired. CAFO permit issued 8/15/06; other pollution controls in place, expected to attain standards
'16 - '22		'06-'14			ME0103000308_331R01	Martin Stream (Dixmont)	Benthic Macroinvertebrates Bioassessments		

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
’16 - ‘22		‘14			ME0103000308_331 R01	Martin Stream (Dixmont)	Periphyton (Aufwuchs) Indicator Bioassessments		8/12/2014: New listing for Aquatic Life Use - algae (periphyton) only met Class B in 2006 and 2012, biomonitoring stations S-756, S-679); covered under existing (expired) permit, cause delisted to Category 4-B.
’14 - ‘16	**‘22**				**ME0103000309_326 R02**	**Halfmoon Stream (Knox, Thorndike)**	**Periphyton (Aufwuchs) Indicator Bioassessments**	**TMDL approved or established by EPA (4A)**	**EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021.**
’14 - ‘16	**‘22**				**ME0103000309_326 R03**	**Halfmoon Stream (Thorndike, Unity)**	**Periphyton (Aufwuchs) Indicator Bioassessments**	**TMDL approved or established by EPA (4A)**	**EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021.**
’02 - ‘14	’16 - ‘22				*ME0103000309_327 R01*	*Mill Stream (Albion)*	*Dissolved Oxygen*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'06- ‘08	’10 - '22				ME0103000309_332 R	Sebasticook River	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
‘04 -'10				'12- ‘22	ME0103000309_332 R	Sebasticook River	Nutrient/Eutrophi-cation Biological Indicators	Applicable WQS attained; due to restoration activities	10/2/12 Nutrient/Eutrophication Biological Indicators cause of Aquatic Life Use impairment delisted to Category 2 due to new data showing removal of cause of impairment.
		(4C) ’02- ’08		'12- ‘22	ME0103000309_332 R01	Sebasticook River (Halifax impoundment)	Benthic Macroinvertebrates Bioassessments	Applicable WQS attained due to restoration activities	Biomonitoring following removal of Halifax Dam confirms attainment of biocriteria
‘02 '04	‘06 -'22				ME0103000310_322 R01	Fish Brook (Fairfield)	Benthic Macroinvertebrates Bioassessments	EPA approval of TMDL (Category 4A) 8/30/2005	EPA approved TMDL 8/30/2005
‘02 '04	‘06 -'22				ME0103000310_322 R01	Fish Brook (Fairfield)	Dissolved Oxygen		

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'02 - '14	*'16 - '22*				*ME0103000311_334 R03*	*Jock Stream (Wales)*	*Nutrient/Eutrophication Biological Indicators*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'02 - '14	*'16 - '22*				*ME0103000311_334 R03*	*Jock Stream (Wales)*	*Dissolved Oxygen*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'02- '08	'10 - '22				ME0103000312_333 R02	Whitney Brook (Augusta)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'10	'12- '22				ME0103000312_333 R02	Whitney Brook (Augusta)	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'10	'12- '22				ME0103000312_333 R02	Whitney Brook (Augusta)	Periphyton (Aufwuchs) Indicator Bioassessments		
'02 -'10	'12- '22				ME0103000312_333 R03	Kennedy Brook (Augusta)	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
	'12- '22				ME0103000312_333 R03	Kennedy Brook (Augusta)	Periphyton (Aufwuchs) Indicator Bioassessments		
'06 -'10	'12- '22				ME0103000312_333 R04	Unnamed tributary to Bond Brook	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'04 -'10	'12- '22				ME0103000312_333 R04	Unnamed tributary to Bond Brook	Habitat Assessment		
	'12- '22				ME0103000312_333 R04	Unnamed tributary to Bond Brook	Periphyton (Aufwuchs) Indicator Bioassessments		
'06- '08	'10 - '22				ME0103000312_339 R_02	Kennebec River at Waterville, CSO	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02- '08	'10 - '22				ME0103000312_340 R_02	Kennebec River at Augusta, including Riggs Brook- CSO	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'02-'08	'10-'22				ME0103000312_340R_03	Kennebec River at Hallowell- CSO	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02-'08	'10-'22				ME0103000312_340R_04	Kennebec River at Gardiner-Randolph	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'04	'06			'08-'22	ME0104000206_423R01	Androscoggin R, main stem, Livermore impoundment	Benthic Macroinvertebrates Bioassessments	Applicable WQS attained due to restoration activities	EPA approved TMDL 7/18/2005 (TMDL #11594). Attained Class C biocriteria in 2003, and attained Class B biocriteria in 2004, 2005 and 2006. Benthic invertebrate and TSS causes delisted to 'WQS attainment'. Also 4-B listed for dioxin and 5D listed for legacy PCB contamination
'04	'06			'08-'22	ME0104000206_423R01	Androscoggin R, main stem, Livermore impoundment	Total Suspended Solids	Applicable WQS attained due to restoration activities	
		'02-'22			ME0104000206_423R01	Androscoggin R, main stem, Livermore impoundment	Dioxin (including 2,3,7,8-TCDD)	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 3/15/2004	Dioxin controls in place. Also 5-D listed for legacy PCB contamination.
		'02-'22			ME0104000207_412R02	House/Lively Brook	Nitrogen (Total)	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 3/15/2004	Waste (manure) removal (Agric NPS) by Consent Order and Site Permit-expected to attain standards; needs additional monitoring to confirm attainment.
'04-'08	'10-'22				ME0104000208_413R01	Jepson Brook (Lewiston)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02-'16	***'22***				***ME0104000208_413R03***	***Stetson Brook (Lewiston)***	***Dissolved Oxygen***	***TMDL approved or established by EPA (4A)***	***EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021.***
'02-'08	'10-'22				ME0104000208_413R03	Stetson Brook (Lewiston)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'02-'08	'10-'22				ME0104000208_413R04	Logan Brook, Auburn	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'04-'10	'12-'22				ME0104000208_413R04	Logan Brook, Auburn	Habitat Assessment (Streams)	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'02-'10	'12-'22				ME0104000208_413R04	Logan Brook, Auburn	Dissolved Oxygen		
'02-'08	'10-'22				ME0104000208_413R07	Gully Brook (Auburn)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	
'04			'06-'22	'02	ME0104000208_413R08	Bobbin Mill Brook (Lake Auburn Outlet, Auburn)	Benthic Macroinvertebrates Bioassessments	Flaws in original listing (Category 3) 3/9/05	6/7/12: Conflicting biomonitoring results (at station S-357): macroinvertebrates attained only Class C in 1998 (likely due to natural conditions) but met Class B in 2003 and 2008; algae (periphyton) showed non-attainment in 2008. Resampling needed to confirm whether impairment exists.
		'02-'22			ME0104000208_424R_01	Androscoggin R, main stem, upstream of the Gulf Island Dam	Dioxin (including 2,3,7,8-TCDD)	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 3/15/2004	Dioxin controls in place
	'08-'10	'12-'22			ME0104000208_424R_01	Androscoggin R, main stem, upstream of the Gulf Island Dam	Algae blooms	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) December 2012	2012 permits are expected to correct existing aquatic life use impairments. Expected to attain in 2017.
	'06-'10	'12-'22			ME0104000208_424R_01	Androscoggin R, main stem, upstream of the Gulf Island Dam	BOD, Biochemical oxygen demand		
	'06-'10	'12-'22			ME0104000208_424R_01	Androscoggin R, main stem, upstream of the Gulf Island Dam	Dissolved Oxygen		

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
	'06 - '10	'12- '22			ME0104000208_424 R_01	Androscoggin R, main stem, upstream of the Gulf Island Dam	Phosphorus (Total)		
	'06 - '10	'12- '22			ME0104000208_424 R_01	Androscoggin R, main stem, upstream of the Gulf Island Dam	Total suspended solids		
'02- '08	'10 - '22				ME0104000209_417 R_02	Little Androscoggin River at Mechanic Falls	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'04 - '14	*'16 - '22*				*ME0104000210_413 R02*	*Penley Brook (Auburn)*	*Dissolved Oxygen*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'04- '10				'16	ME0104000210_418 R01	Sabattus River between Sabattus and Androscoggin R	Benthic Macroinvertebrates Bioassessments	Applicable WQS attained; original basis for listing was incorrect	Aquatic life use impairment was delisted to Category 2 due to classification attainment at 3 biomonitoring stations (S-359, S-629, S-630) on 2-3 occasions.
'02 - '16	***'22***				***ME0104000210_418 R02***	***No Name Brook (Lewiston)***	***Dissolved Oxygen***	***TMDL approved or established by EPA (4A)***	***EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021.***
'02- '08	'10 - '22				ME0104000210_418 R02	No Name Brook (Lewiston)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02 -'10	'12- '22				ME0104000210_419 R01	Unnamed Brook (Biomon Sta. 347-Lisbon Falls at Rt 196)	Habitat Assessment	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'06- '08	'10 - '22				ME0104000210_419 R02	Hart Brook (Lewiston) A.K.A Dill Brook and including Goff Bk	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'06 -'10	'12- '22				ME0104000210_419 R02	Hart Brook (Lewiston) A.K.A Dill Brook and including Goff Bk	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'02 -'10	'12-'22				ME0104000210_419R02	Hart Brook (Lewiston) A.K.A Dill Brook and including Goff Bk	Habitat Assessment		
'06 -'10	'12-'22				ME0104000210_419R02	Hart Brook (Lewiston) A.K.A Dill Brook and including Goff Bk	Dissolved Oxygen		
	'12-'22				ME0104000210_419R02	Hart Brook (Lewiston) A.K.A Dill Brook and including Goff Bk	Periphyton (Aufwuchs) Indicator Bioassessments		
'10	'12-'22				ME0104000210_420R01	Unnamed tributary (Brunswick 2) to Androscoggin R	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'04 -'10	'12-'22				ME0104000210_420R01	Unnamed tributary (Brunswick 2) to Androscoggin R	Habitat Assessment		
'10	'12-'22				ME0104000210_420R02	Unnamed tributary (Brunswick 3) to Androscoggin R	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'04 -'10	'12-'22				ME0104000210_420R02	Unnamed tributary (Brunswick 3) to Androscoggin R	Habitat Assessment		
'10	'12-'22				ME0104000210_420R03	Unnamed tributary (Brunswick 4) to Androscoggin R	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'04 -'10	'12-'22				ME0104000210_420R03	Unnamed tributary (Brunswick 4) to Androscoggin R	Habitat Assessment		
	'12-'22				ME0104000210_420R04	Unnamed tributary (Topsham 2) to Androscoggin R	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'04 -'10	'12-'22				ME0104000210_420R04	Unnamed tributary (Topsham 2) to Androscoggin R	Habitat Assessment		

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'10	'12-'22				ME0104000210_420R05	Unnamed tributary (Topsham 4) to Androscoggin	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'06-'08	'10-'22				ME0104000210_425R_02	Androscoggin River, Lewiston-Auburn	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'08-'10	'10-'22				ME0105000108_505R_02	St. Croix R., Calais CSO	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
		'02-'16			ME0105000201_507R01	Dennys River	Polychlorinated biphenyls	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 9/5/2006	Haz waste remediation project (Superfund)--expected to attain standards by 2010.
'08-'10	'12-'22				ME0105000213_514R_01	Card Brook (Ellsworth)	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'04-'10	'12-'22				ME0105000213_514R_01	Card Brook (Ellsworth)	Dissolved Oxygen		
'02'04	'06-'22				ME0105000217_520R01	Carleton Stream (Blue Hill)	Benthic Macroinvertebrates Bioassessments	EPA approval of TMDL (Category 4A) 10/7/2004	EPA approved TMDL 10/7/2004
'02'04	'06-'22				ME0105000217_520R01	Carleton Stream (Blue Hill)	Iron		
'02-'14	*'16-'22*				*ME0105000218_521R01*	*Warren Brook (Belfast)*	*Dissolved Oxygen*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'02-'08	'10-'22				ME0105000220_522R01_01	Megunticook River (Camden)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL

Category by Report Year									
5	4-A	4-B	3	2	Assessment Unit ID	Water Name	Cause	Delisting Reason / Date	Comments
'02-'08	'10			'12-'22	ME0105000220_522R02_01	Rock Brook (formerly 'Unnamed Brook') (Camden)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	5/24/2012: Delisted to Category 2 due to newer monitoring data showing attainment of bacteria standards. 7/28/2010: Stream name updated from 'Unnamed Brook' Camden to Rock Brook.
'04-'08				'10-'22	ME0105000220_522R03	Unnamed Brook (Rockport)	Escherichia coli	Applicable WQS attained; original basis for listing was incorrect	Monitoring for Statewide bacteria TMDL indicates this water attains bacteria standards
'02-'08	'10-'22				ME0105000220_522R04	Unnamed Brook (Rockland)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	11/7/12: City of Rockland performed remedial sewer work in 2012 to address bacteria contamination; more work is likely needed in the future to successfully address the entire watershed.
'02-'08	'10-'22				ME0105000305_528R01	Sheepscot River at Alna	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'10-'12	'14-'22				ME0105000305_528R02	West Branch Sheepscot River	Escherichia coli	TMDL approved by EPA (4A) 9/22/2014	EPA approval of TMDL
'04-'08				'10-'22	ME0105000305_528R02	West Branch Sheepscot River	Dissolved Oxygen	Applicable WQS attained; due to restoration activities	TMDL analysis of additional monitoring data demonstrates that segment attains dissolved oxygen standards.
			'10	'12-'22	ME0105000305_528R02	West Branch Sheepscot River	Benthic Macroinvertebrates Bioassessments		Erroneous Category 3 listing – no data available
'12-'16			'10		ME0105000305_528R02	West Branch Sheepscot River	Periphyton (Aufwuchs) Indicator Bioassessments	Insufficient information to determine if WQS attained	Category 3 due to inconsistent attainment of narrative aquatic life standards for algae
'02-'08	'10-'22				ME0105000305_528R03	Dyer River below Rt 215	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL

Category by Report Year									
5	4-A	4-B	3	2	Assessment Unit ID	Water Name	Cause	Delisting Reason / Date	Comments
'02 - '14	*'16 - '22*				*ME0105000305_528 R03*	*Dyer River below Rt 215*	*Dissolved Oxygen*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'02 - '14	*'16 - '22*				*ME0105000305_528 R04*	*Trout Brook (Alna)*	*Dissolved Oxygen*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'02 - '14	*'16 - '22*				*ME0105000305_528 R05*	*Meadow Bk (China)*	*Dissolved Oxygen*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'02 - '14	*'16 - '22*				*ME0105000305_528 R06*	*Carlton Bk (Whitefield)*	*Dissolved Oxygen*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'02 - '14	*'16 - '22*				*ME0105000305_528 R07*	*Choate Bk (Windsor)*	*Dissolved Oxygen*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'04 - '14	*'16 - '22*				*ME0105000305_528 R08_01*	*Chamberlain Bk (Whitefield)*	*Dissolved Oxygen*	*TMDL approved or established by EPA (4A)*	*EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016*
'02 '04		'06-'22			ME0105000305_528 R08_02	Sheepscot River below Sheepscot L	Dissolved Oxygen	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 6/20/2006	8/6/2012: hatchery permit renewed 12/19/11, expiration date 12/19/2016. Expected to attain standards by 2016.
'02 '04		'06-'22			ME0106000101_605 R01	Mile Brook (Casco)	Benthic Macroinvertebrates Bioassessments	Other point source or nonpoint source controls are expected to meet water quality standards (Category 4B) 6/20/2006	6/8/2012: Hatchery permit re-issued 5/2/12, expiration date 5/1/17. Macroinvertebrates only attained Class C criteria in 2010. Facility upgrades occurred in the fall of 2011.
'02 - '14	'16 - '22				ME0106000102_603 R02	Chandler River including East Branch	Dissolved Oxygen	TMDL approved or established by EPA (4A)	EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'02 '04				'06-'22	ME0106000102_603 R05	Royal River, segment below Collyer Bk	Drinking water-trichloroethylene	State determines water quality standard is being met (Category 2) 8/31/2006	Per CERCLA hazardous waste site manager: June 2006 surface water monitoring determined that the trichloroethylene standards and all other water quality criteria are being met in the Royal River at sites down-gradient of the contaminated site.
'02 - '16	***'22***				***ME0106000103_607 R01***	***Black Brook (Windham)***	***Dissolved Oxygen***	***TMDL approved or established by EPA (4A)***	***EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021.***
'02 - '16	***'22***				***ME0106000103_607 R03***	***Colley Wright Brook (Windham)***	***Dissolved Oxygen***	***TMDL approved or established by EPA (4A)***	***EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021.***
'02-'08	'10 - '22				ME0106000103_607 R03	Colley Wright Brook (Windham)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'04 - '08				'10-'22	ME0106000103_607 R04	Piscataqua River (Falmouth)	Escherichia coli	Applicable WQS attained; original basis for listing was incorrect	Monitoring for Statewide bacteria TMDL indicates this water attains bacteria standards
'02-'08	'10 - '22				ME0106000103_607 R04	Piscataqua River (Falmouth)	Escherichia coli	Applicable WQS attained; original basis for listing was incorrect	
'02-'08	'10 - '22				ME0106000103_607 R06	Hobbs Brook (Cumberland)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02 - '14	'16 - '22				ME0106000103_607 R06	Hobbs Brook (Cumberland)	Dissolved Oxygen	TMDL approved or established by EPA (4A)	EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016
'02 - '16	***'22***				***ME0106000103_607 R07***	***Inkhorn Brook (Westbrook)***	***Dissolved Oxygen***	***TMDL approved or established by EPA (4A)***	***EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021.***
'02-'08	'10 - '22				ME0106000103_607 R07	Inkhorn Brook (Westbrook)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'02 - '16	***'22***				***ME0106000103_607 R08***	***Mosher Brook (Gorham)***	***Dissolved Oxygen***	***TMDL approved or established by EPA (4A)***	***EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021.***
'02-'08	'10 - '22				ME0106000103_607 R08	Mosher Brook (Gorham)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02 - '16	***'22***				***ME0106000103_607 R09***	***Otter Brook (Windham)***	***Dissolved Oxygen***	***TMDL approved or established by EPA (4A)***	***EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021.***
'02-'08	'10 - '22				ME0106000103_607 R09	Otter Brook (Windham)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02 - '14	'16 - '22				ME0106000103_607 R10	Thayer Brook	Dissolved Oxygen	TMDL approved or established by EPA (4A)	EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016
'02-'08	'10 - '22				ME0106000103_607 R11	Nason Brook (Gorham)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'06 - '16	***'22***				***ME0106000103_607 R12***	***Pleasant River (Windham)***	***Dissolved Oxygen***	***TMDL approved or established by EPA (4A)***	***EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021.***
'06-'08	'10 - '22				ME0106000103_607 R12	Pleasant River (Windham)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
	'02 '04			'06-'22	ME0106000103_609 R_01	Presumpscot R, main stem, below Sacarappa Dam	BOD, Biochemical oxygen demand	State determines water quality standard is being met (Category 2) 8/31/2006	Sources removed, pulping operation closed and Smelt Hill Dam has been breached. Bioassessment (2005) shows attainment of Class C dissolved oxygen and biocriteria (Class B biocriteria just above Smelt Hill dam site).
	'02 '04			'06-'22	ME0106000103_609 R_01	Presumpscot R, main stem, below Sacarappa Dam	Total Suspended Solids (TSS)		
'02-'08	'10 - '22				ME0106000103_609 R_02	Presumpscot River at Westbrook	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'04 -'10	'12-'22				ME0106000104_611 R02	Phillips Brook (Scarborough)	Habitat Assessment		Approval of Statewide % Impervious Cover TMDL.

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
	'12-'22				ME0106000104_611R02	Phillips Brook (Scarborough)	Dissolved Oxygen	TMDL approved or established by EPA (4A) 9/27/12	
'06-'10	'12-'22				ME0106000105_607R11_01	Nasons Brook (Portland), trib to Fore River	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
	'12-'22				ME0106000105_607R11_01	Nasons Brook (Portland), trib to Fore River	Dissolved Oxygen		
	'12-'22				ME0106000105_607R11_01	Nasons Brook (Portland), trib to Fore River	Periphyton (Aufwuchs) Indicator Bioassessments		
'06-'10	'12-'22				ME0106000105_607R11_02	Nasons Brook (Westbrook), trib to Fore River	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
	'12-'22				ME0106000105_607R11_02	Nasons Brook (Westbrook), trib to Fore River	Dissolved Oxygen		
	'12-'22				ME0106000105_607R11_02	Nasons Brook (Westbrook), trib to Fore River	Periphyton (Aufwuchs) Indicator Bioassessments		
'06-'10	'12-'22				ME0106000105_609R01	Dole Brook (formerly known as 'Unnamed Stream-Portland 3')	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'06-'10	'12-'22				ME0106000105_610R01	Capisic Brook	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'02-'10	'12-'22				ME0106000105_610R01	Capisic Brook	Habitat Assessment		
	'12-'22				ME0106000105_610R01	Capisic Brook	Periphyton (Aufwuchs) Indicator Bioassessments		
'02-'08		'10-'22			ME0106000105_610R03	Long Creek (South Portland)	Benthic Macroinvertebrates Bioassessments	Other enforceable controls are in place	4/1/21: Watershed restoration process ongoing with third five-year

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'02 - '08		'10- '22			ME0106000105_610 R03	Long Creek (South Portland)	Habitat Assessment	6/9, 2010. Expected to attain: 2020	permit cycle to start in 2021. Includes all tributaries. Long Creek was moved to Category 4-B due to Stormwater General Permit, MEPDES MEG190000 (November 6, 2009).
'02 - '08		**'10 - '22**			**ME0106000105_610 R03_01**	**Blanchette Brook (Westbrook)**	**Benthic Macroinvertebrates Bioassessments**	**Other enforceable controls are in place 6/9, 2010. Expected to attain: 2020**	**4/1/21: Watershed restoration process ongoing with third five-year permit cycle to start in 2021. Previously included in Long Creek (South Portland), split out in 2022 cycle because of different Class. Long Creek was moved to Category 4-B due to Stormwater General Permit, MEPDES MEG190000 (November 6, 2009).**
'02 - '08		**'10 - '22**			**ME0106000105_610 R03_01**	**Blanchette Brook (Westbrook)**	**Habitat Assessment**		
'02 - '06	'08 - '22				ME0106000105_610 R05	Trout Brook (So. Portland)	Benthic Macroinvertebrates Bioassessments	EPA approval of TMDL (Category 4A) 10/25/2007	EPA approved TMDL 10/25/2007 (under bundled urban stream project)
'06 -'10	'12- '22				ME0106000105_610 R06	Kimball Brook	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'02 -'10	'12- '22				ME0106000105_610 R06	Kimball Brook	Habitat Assessment		
'02 -'10	'12- '22				ME0106000105_610 R07	Red Brook (Scarborough, S Portland)	Habitat Assessment	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'22	**'22**				**ME0106000105_610 R07**	**Red Brook (Scarborough, S Portland)**	**Benthic Macroinvertebrates Bioassessments**	**TMDL approved or established by EPA (4A) 9/27/12**	**11/9/2021: Aquatic life use impairment covered under Statewide % Impervious Cover TMDL (approved 9/27/12), moved to Category 4-A.**
'02 - '06	'08 - '22				ME0106000105_610 R09	Barberry Cr	Benthic Macroinvertebrates Bioassessments	EPA approval of TMDL (Category 4A) 6/21/2007	EPA approved TMDL 6/21/2007 (under bundled urban stream project.)

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'02 - '06	'08 - '22				ME0106000105_610 R09	Barberry Cr	Habitat Assessment	EPA approval of TMDL (Category 4A) 6/21/2007	EPA approved TMDL 6/21/2007 (under bundled urban stream project.)
'02- '08	'10 - '22				ME0106000106_602 R01	Frost Gully Brook	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	
'04 -'10	'12- '22				ME0106000106_602 R01	Frost Gully Brook	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'04 -'10	'12- '22				ME0106000106_602 R01	Frost Gully Brook	Habitat Assessment		
	'12- '22				ME0106000106_602 R02	Mare Brook (Brunswick) and selected tributaries	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'02 -'10	'12- '22				ME0106000106_602 R02	Mare Brook (Brunswick) and selected tributaries	Habitat Assessment		
'10	'12- '22				ME0106000106_602 R03	Concord Gully (Freeport)	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'04 -'10	'12- '22				ME0106000106_602 R03	Concord Gully (Freeport)	Habitat Assessment		
'10	'12- '22				ME0106000106_602 R03	Concord Gully (Freeport)	Dissolved Oxygen		
	'12- '22				ME0106000106_602 R03	Concord Gully (Freeport)	Periphyton (Aufwuchs) Indicator Bioassessments		
'04			'06- '16	'02	ME0106000106_607 R12	Norton Brook (Falmouth)	Benthic Macroinvertebrates Bioassessments	Flaws in original listing of this cause (Category 3) 10/2006	Administrative error, conflicting data. More data required to support impaired assessment. Non-attainment of biocriteria in 2002 may be due to natural habitat effects; needs resampling
'12	'14- '22				ME0106000106_612 R01	Goosefare Brook above I-95	Escherichia coli	TMDL approved by EPA (4A) 9/22/2014	EPA approval of TMDL
'12	'14- '22				ME0106000106_612 R01_01	Goosefare Brook below I-95	Escherichia coli	TMDL approved by EPA (4A) 9/22/2014	EPA approval of TMDL

Category by Report Year									
5	4-A	4-B	3	2	Assessment Unit ID	Water Name	Cause	Delisting Reason / Date	Comments
	'12-'22				ME0106000106_612R01_01	Goosefare Brook below I-95	Benthic Macroinvertebrates Bioassessments	TMDL approved by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'02	'04-'22				ME0106000106_612R01_01	Goosefare Brook	Cd, Cr, Cu, Fe, Pd, Ni, Zn	TMDL approved by EPA (4A) 9/29/2003	EPA approved TMDL 9/29/2003; name changed in 2012 - added 'below I-95'
'02-'08	'10-'22				ME0106000106_612R01_02	Bear Brook, Saco CSO	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02-'08	'10-'22				ME0106000106_616R04	Bear Bk	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'04-'08				'10-'22	ME0106000204_618R01	Saco R., Fryeburg	Escherichia coli	Applicable WQS attained; original basis for listing was incorrect	Monitoring for Statewide bacteria TMDL indicates this water attains bacteria standards
'04 '06 '08				'10-'22	ME0106000209_614R01	Ossippee R	Escherichia coli	Applicable WQS attained; original basis for listing was incorrect	Monitoring for Statewide bacteria TMDL indicates this water attains bacteria standards
'02-'08	'10-'22				ME0106000211_616R02	Tappan Bk	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02-'08	'10-'22				ME0106000211_616R03	Sawyer Bk	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'06-'10	'12-'22				ME0106000211_616R05	Thacher Bk (Biddeford)	Benthic Macroinvertebrates Bioassessments	TMDL approved by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
'02-'08	'10-'22				ME0106000211_616R05	Thatcher Bk (Biddeford)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02-'08	'10-'22				ME0106000211_616R06	Swan Pond Brook at South Street (Biddeford)	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
'06-'08	'10-'22				ME0106000211_619R01	Saco River at Biddeford-Saco	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'02-'08	'10-'22				ME0106000301_622R01	Kennebunk River	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
'06'08		'10-'22			ME0106000301_622R02	Lord's Brook (Lyman)	BOD, Biochemical oxygen demand	TMDL Alternative	Court-ordered controls in place
'06'08		'10-'22			ME0106000301_622R02	Lord's Brook (Lyman)	Nutrient/Eutrophication Biological Indicators		
'06'08		'10-'22			ME0106000301_622R02	Lord's Brook (Lyman)	Dissolved Oxygen		
'12	'14-'22				ME0106000301_622R03	Duck Brook and tributaries	Escherichia coli	TMDL approved by EPA (4A) 9/22/2014	EPA approval of TMDL
	'04-'12	'14-'22			ME0106000302_628R01	Mousam R, Main stem, Rt. 224 (Bridge St.) bridge in Sanford to Estes Lake	Aluminum	TMDL Alternative (4B)	3/5/2015: Ammonia, BOD, Total Phosphorus, Aluminum and Copper moved to Category 4-B because 6/12/2013 permit established limits for these pollutants.
	'04-'12	'14-'22			ME0106000302_628R01	Mousam R, Main stem, Rt. 224 (Bridge St.) bridge in Sanford to Estes Lake	Ammonia (Un-ionized)		
	'04-'12	'14-'22			ME0106000302_628R01	Mousam R, Main stem, Rt. 224 (Bridge St.) bridge in Sanford to Estes Lake	BOD, Biochemical oxygen demand		
	'04-'12	'14-'22			ME0106000302_628R01	Mousam R, Main stem, Rt. 224 (Bridge St.) bridge in Sanford to Estes Lake	Copper		

Category by Report Year									
5	**4-A**	**4-B**	**3**	**2**	**Assessment Unit ID**	**Water Name**	**Cause**	**Delisting Reason / Date**	**Comments**
	'04 -'12	'14-'22			ME0106000302_628R01	Mousam R, Main stem, Rt. 224 (Bridge St.) bridge in Sanford to Estes Lake	Phosphorus (Total)		
'02-'08	'10 - '22				ME0106000302_628R02	Mousam River at Sanford	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	
'04 - '16	***'22***				***ME0106000304_625R01***	***Adams Brook (Berwick)***	***Benthic Macroinvertebrates Bioassessments***	***TMDL approved or established by EPA (4A)***	***EPA approved addendum to Statewide Nonpoint Source Pollution TMDL 9/23/2021.***
'02 - '14	'16 - '22				ME0106000304_625R03	West Brook (N. Berwick)	Dissolved Oxygen	TMDL approved or established by EPA (4A)	EPA approved Statewide Nonpoint Source Pollution TMDL 8/9/2016
	'12		'06 -'22		ME0106000304_625R04	Goodall Brook (Sanford)	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Approval of Statewide % Impervious Cover TMDL.
	'12-'22				ME0106000304_625R04	Goodall Brook (Sanford)	Habitat Assessment		
'02-'08	'10 - '22				ME0106000305_630R01	Salmon Falls R	Escherichia coli	TMDL approved by EPA (4A) 9/28/2009	Approval of Statewide Bacteria TMDL
	'02 -'22				ME0106000305_630R01	Salmon Falls R	Ammonia (Un-ionized)	EPA approval of TMDL (Category 4A) 11/1/1999	4-A EPA approved TMDL 11/22/99 for BOD, ammonia and phosphorus; 5-D fish tissue monitoring shows legacy PCBs and Dioxin
	'02 -'22				ME0106000305_630R01	Salmon Falls R	Nutrient/Eutrophi-cation Biological Indicators		
	'02 -'22				ME0106000305_630R01	Salmon Falls R	Dissolved Oxygen		

Table 8- 11 Status of Listed and Delisted Category 5 Lakes and Ponds

Note that history (2000–2016) is provided for lakes that have been listed in Category 5 at any time since 2002 per request of EPA Region I staff. Bold font indicates lakes added this cycle. Waters that are included in Maine's implementation of EPA's 303(d) Vision are indicated in italics.

Lake	Town	MIDAS	Acres	HUC10	Listing Category by Reporting Cycle										Comments
					00[2]	02	04	06	08	10	12	14	16	22	
DAIGLE P	NEW CANADA	1665	36	101000303	(5A)	5A	5A	4A	4A	4A	4A	4A	4A	4A	22: Stable; TMDL Sept. 2006
CROSS L	T17 R05 WELS	1674	2515	101000303	(5A)	5A	5A	4A	4A	4A	4A	4A	4A	4A	22: Stable; TMDL Sept. 2006
ARNOLD BROOK L	PRESQUE ISLE	409	395	101000412	(5A)	5A	5A	5A	4A	4A	4A	4A	4A	4A	22: Stable; TMDL Feb. 2007
ECHO L	PRESQUE ISLE	1776	90	0101000412	(5A)	5A	5A	5A	4A	4A	2 *	2 *	2 *	2 *	22: Improving, occasional bloom ; TMDL Feb. 2007
MADAWASKA L	T16 R04 WELS	1802	1526	0101000413	(5A)	4A	4A	2 *	2 *	2 *	2 *	2 *	2 *	2 *	22: Possible deteriorating trend, occasional bloom; TMDL 2000
MONSON P	FT FAIRFIELD	1820	160	0101000413	(5A)	5A	5A	5A	4A	4A	4A	4A	4A	4A	22: Stable; TMDL Nov. 2006
TRAFTON L	LIMESTONE	9779	85	0101000413	(5A)	5A	5A	5A	4A	4A	4A	4A	4A	4A	22: Stable; TMDL Oct. 2006
CHRISTINA RESERVOIR	FT FAIRFIELD	9525	400	0101000501	(5A)	5A	5A	5A	5A	4A	4A	4A	4A	4A	22: Stable, chronic blooming 'wetland'; TMDL March 2010
OTTER P	**MAYFIELD TWP**	**7142**	**25**	**0102000401**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**4C**	**22: Pond bottom covered with sawdust covering aquatic habitat**
HERMON P	HERMON	2286	461	0102000511	(5A)	5A	5A	5A	5A	5A	2	2	2	2	22: Stable; Paleo evidence of historic natural productivity; in equilibrium with adjacent wetlands
HAMMOND P	HAMPDEN	2294	83	0102000511	(5A)	5A	5A	5A	5A	5A	2	2	2	2	22: Stable; Paleo evidence of historic natural productivity; in equilibrium with adjacent wetlands and upstream lake
ALAMOOSOOK L	**ORLAND**	**4336**	**1133**	**0102000513**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**5A**	**22: Deteriorating trophic trend min and mean Secchi due to hatchery discharge**
TOOTHAKER P	PHILLIPS	2336	30	0103000305	-3	5A	5A	4A	4A	4A	4A	4A	4A	4A	22: Improving; TMDL Sept. 2004
SEBASTICOOK L	NEWPORT	2264	4288	0103000308	(5A)	4A	4A	4A	4A	4A	4A	4A	4A	4A	22: Slow Improv.; TMDL 2001
UNITY P	UNITY	5172	2528	0103000309	(5A)	5A	5A	4A	4A	4A	4A	4A	4A	4A	22: Stable; TMDL Sept 2004
LOVEJOY P	ALBION	5176	324	0103000309	(5A)	5A	5A	4A	4A	4A	4A	4A	4A	4A	22: Stable; TMDL 2004
CHINA L	CHINA	5448	3845	0103000309	(5A)	4A	4A	4A	4A	4A	4A	4A	4A	4A	22: Stable, blooms persist; TMDL 2001.
LONG P	BELGRADE	5272	2714	0103000310	-3	3	3	5A	5A	4A	4A	4A	4A	4A	22: Deterior. Trophic & DO; Gloeotrichia blooms; trophic param. indicate shift; TMDL April 2008
GREAT P	*BELGRADE*	*5274*	*8239*	*0103000310*	*-3*	*3*	*3*	*3*	*3*	*5A*	*5A*	*5A*	*5A*	*5-Alt*	*22: Deterior. Trophic & DO; Gloeotrichia blooms*

Lake	Town	MIDAS	Acres	HUC10	Listing Category by Reporting Cycle										Comments
					00[2]	02	04	06	08	10	12	14	16	22	
EAST P	SMITHFIELD	5349	1823	0103000310	(5A)	4A	4A	4A	4A	4A	4A	4A	4A	4A	22: Improved due to alum treatment in 2018; TMDL 2001
NARROWS P (UPPER)	WINTHROP	98	279	0103000311	-3	5A	5A	2 *	2 *	2 *	2 *	2 *	2 *	2 *	22: Originally listed in 1998, TMDL 2005. Data indicate stable trend
COCHNEWAGON P	MONMOUTH	3814	410	0103000311	-2	2	2	3	3	3	5A	5A	5A	5A	22: Original Alum treatment no longer effective; retreated in 2019; improved
WILSON P	WAYNE	3832	582	0103000311	-3	3	2	5A	4A	4A	4A	4A	4A	4A	22: deteriorating trophic trend – all trophic param.; TMDL Aug. 2007
COBBOSSEECONTEE L	WINTHROP	5236	5543	0103000311	(5A)	4A	4A	2 *	2 *	2 *	2 *	2 *	2 *	2 *	22: persistent improvement
PLEASANT (MUD) P	GARDINER	5254	746	0103000311	(5A)	5A	4A	4A	4A	4A	4A	4A	4A	4A	22: Stable, blooms persist; TMDL complete 2004
LITTLE COBBOSSEECONTEE	WINTHROP	8065	75	0103000311	(5A)	5A	5A	4A	4A	4A	2 *	2 *	2 *	2 *	22: Improving; rarely blooms; TMDL 2005
ANNABESSACOOK L	MONMOUTH	9961	1420	0103000311	(5A)	5A	4A	4A	4A	4A	4A	4A	4A	4A	22: Improving but blooms persist; TMDL 2004
WEBBER P	VASSALBORO	5408	1201	0103000312	(5A)	5A	4A	4A	4A	4A	4A	4A	4A	4A	22: Stable; chronic blooms; TMDL 2003
THREEMILE P	CHINA	5416	1162	0103000312	(5A)	5A	4A	4A	4A	4A	4A	4A	4A	4A	22: Stable; chronic blooms; TMDL 2003
THREECORNERED P	AUGUSTA	5424	182	0103000312	(5A)	5A	4A	3	3	2 *	2 *	2 *	2 *	2 *	22: TMDL 2003;Improving; no recent blooms
TOGUS P	AUGUSTA	9931	660	0103000312	(5A)	5A	5A	4A	4A	4A	4A	4A	4A	4A	22: Stable; TMDL Sept 2005
SABATTUS P	GREENE	3796	1962	0104000210	(5A)	5A	5A	4A	4A	4A	4A	4A	4A	4A	22: Stable perhaps improving; TMDL August 2004
LILLY P	ROCKPORT	83	29	0105000220	(5A)	5A	5A	4A	4A	4A	4A	4A	4A	4A	22: Stable; TMDL Dec. 2005
DUCKPUDDLE P	NOBLEBORO	5702	293	0105000303	(5A)	5A	5A	3	3	2 *	2 *	2 *	2 *	2 *	22: Stable; TMDL Sept 2005, occasional bloom
SEWALL P	ARROWSIC	9943	46	0105000307	-3	3	5A	4A	4A	4A	4A	4A	4A	4A	22: Stable; TMDL March 2006
HIGHLAND L	BRIDGTON	3454	1401	0106000101	(5A)	5A	5A	2*	2*	2*	2 *	2 *	2 *	2 *	22: TMDL Aug 2004; data indicates persistent stable trend
LONG L	BRIDGTON	5780	4867	0106000101	(5A)	5A	5A	2 *	2 *	2 *	2 *	2 *	2 *	2 *	22: TMDL May 2005; Data indicate stable trend.
HIGHLAND (DUCK) L	FALMOUTH	3734	634	0106000103	(5A)	5A	4A	4A	4A	2 *	2 *	2 *	2 *	2 *	22: TMDL 2003; recent fluctuations in transparency
MOUSAM L	ACTON	3838	900	0106000302	(5A)	5A	4A	2*	2*	2 *	2 *	2 *	2 *	2 *	22: Attainment of monitored uses verified. Data indicate stable trend.
ELL (L) P	WELLS	119	32	0106000304	(5A)	3	2	2 *	2 *	2 *	2 *	2 *	2 *	2 *	22: Delisted; no longer supports repeated nuisance blooms

[1] Non TMDL listing changes are summarized in Appendix III, Category Listing Change Summary
[2] In 2000, current Listing Categories had not been established. Equivalent Listing Categories have been assigned for purposes of comparison.
* Lakes currently listed in Category 2 do not appear individually in Appendix III but rather are included in the overall lake summary for the HUC.

Table 8- 12 Status of Delisted Category 5 WetlandsTable

Wetlands were listed for the first time in the 2010 cycle. As a result, this table only contains the listing history of wetlands that were delisted in the 2010 through 2022 cycles. Bold font indicates AU/Cause combinations that changed category during the 2022 cycle. For more detailed comments, consult Appendix IV, Category 4-A, 4-B and 2.

Category by Report Year					Assessment Unit ID	Water Name	Cause	Delisting Reason / Date	Comments
5	4-A	4-B	3	2					
	’16 - ‘22				ME0101000303_1665L_W208	Daigle Pond west wetlands	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/28/2006	Delisted to Category 4A - impairment covered under approved Daigle Pond TMDL, 9/28/2006. Segment also listed as 4-C for Other flow regime alterations.
	’14- ‘22		‘12		ME0101000501_149R_W200	Tributary wetlands to Prestile Stream above dam in Mars Hill	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 5/10/2010	Delisted to Category 4A - impairment covered under approved Prestile Stream TMDLs, 5/10/2010. Segment also listed as 5-D for legacy DDT sources.
‘12	’14- ‘22				ME0101000501_149R01_W203	Prestile Stream wetlands above dam in Mars Hill	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 5/10/2010	Delisted to Category 4A - impairment covered under approved Prestile Stream TMDLs, 5/10/2010. Segment also listed as 5-D for legacy DDT sources.
	’14- ‘22		‘12		ME0101000501_9525_W115	Christina Reservoir wetlands	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 5/10/2010	Delisted to Category 4A - impairment covered under approved Prestile Stream TMDLs, 5/10/2010.
		‘12		’14- ‘22	ME0103000308_325R01_W080	East Branch Sebasticook River Wetland	Benthic Macroinvertebrates Bioassessments	Applicable WQS attained; due to restoration activities	9/15/2014: Long-term monitoring data show criteria attainment for chlorinated benzenes and attainment of Class C aquatic life standards.
		‘12		’14- ‘22	ME0103000308_325R01_W080	East Branch Sebasticook River Wetland	Benzene		
	’16 - ‘22				ME0104000210_3796_W099	Sabattus Pond wetlands	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 8/12/2004.	Delisted to Category 4-A - covered under approved Sabattus Lake TMDL, 8/12/2004.

Category by Report Year					Assessment Unit ID	Water Name	Cause	Delisting Reason / Date	Comments
5	4-A	4-B	3	2					
'10	'12-'22				ME0106000105_607R11_01_W127	Nasons Brook Wetland Complex, Portland	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Delisted to Category 4-A - covered under approved Statewide % Impervious Cover TMDL.
'10	'12-'22				ME0106000105_607R11_02_W172	Nasons Brook Wetland Complex, Westbrook	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Delisted to Category 4-A - covered under approved Statewide % Impervious Cover TMDL.
	'12-'22		'10		ME0106000105_609R01_W026	Dole Brook wetlands	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Delisted to Category 4-A - covered under approved Statewide % Impervious Cover TMDL.
'10	'12-'22				ME0106000105_610R01_W023	Capisic Pond wetland	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Delisted to Category 4-A - covered under approved Statewide % Impervious Cover TMDL.
'10	'12-'22				ME0106000211_616R05_W043	Thacher Brook (Biddeford) wetland	Benthic Macroinvertebrates Bioassessments	TMDL approved or established by EPA (4A) 9/27/12	Delisted to Category 4-A - covered under approved Statewide % Impervious Cover TMDL.
		'10 - '22			ME0106000301_622R02_W176	Lord's Brook Pond wetland	Benthic Macroinvertebrates Bioassessments	TMDL Alternative	Court-ordered controls in place 2/09

Table 8- 13 Status of Delisted Category 5 Marine/Estuarine Waters

A history table similar to Table 8- 10 through Table 8- 12 for other waterbody types has not been previously compiled for estuarine and marine waters. For this 2018/2020/2022 cycle, Table 8-13 has been added to include segments specifically for the Shellfish Harvest Designated Use that were placed in Category 3 based on administrative closures (insufficient data) made by the Maine Department of Marine Resources (DMR). In the interest of avoiding duplication, a column for "Category by Report Year: '2022' and '3' " was not included in this table. While the vast majority of the segments present in this table were located in Category 5-B-1 (a-c) in the 2016 cycle, complete correspondence is not possible until a crosswalk table aligning new Assessment Units and prior Waterbody IDs/DMR Pollution Areas has been generated. Once available, the crosswalk table will be posted at www.maine.gov/dep/water/monitoring/305b/index.html.

Assessment Unit ID	Segment Name	Cause	Delisting Reason	Comments
ME010200051007_SC_WX_PE	Squaw Point (Stockton Springs) to Dice Head (Castine) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010200051008_SB_WX_PE	Squaw Point (Stockton Springs) to Dice Head (Castine) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010200051009_SB_WX_PE	Squaw Point (Stockton Springs) to Dice Head (Castine) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010200051009_SC_WX_PE	Squaw Point (Stockton Springs) to Dice Head (Castine) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500010809_SC_EU_PE	St. Croix River; Eastport to Calais (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500010810_SB_EU_PE	St. Croix River; Eastport to Calais (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500020604_SB_ER_PE	Point of Maine (Machiasport) to Cape Wash (Cutler) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500020703_SB_ER_CAE	Point of Maine (Machiasport) to Cape Wash (Cutler) (Conditionally Approved)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section CA1
ME010500020703_SB_ER_PE	Point of Maine (Machiasport) to Cape Wash (Cutler) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P2-P4
ME010500020801_SB_EP_PE	Henry Point (Jonesport) to Sea Wall Point (Roque Bluffs) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500020802_SB_EN_PE	Cape Split (South Addison) to Henry Point (Jonesport), incl. Beals (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500020805_SB_EN_PE	Cape Split (South Addison) to Henry Point (Jonesport), incl. Beals (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P2-P4
ME010500020904_SB_EM_PE	Pleasant River (Addison), Cape Split (Columbia Falls and Harrington) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500020906_SB_EL_PE	Petit Manan Point to Ripley Neck (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500020908_SB_EM_PE	Pleasant River (Addison), Cape Split (Columbia Falls and Harrington) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2

Assessment Unit ID	Segment Name	Cause	Delisting Reason	Comments
ME010500021005_SB_EL_PE	Petit Manan Point to Ripley Neck (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2
ME010500021008_SB_EL_PE	Petit Manan Point to Ripley Neck (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P3
ME010500021105_SB_EJ_PE	Schoodic Point (Winter Harbor) to Dyer Point (Steuben) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1, P2
ME010500021108_SB_EK_PE	Dyer Bay, Dyer Harbor and Pinkham Bay (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1, P2
ME010500021111_SB_EI_PE	Great Head (Bar Harbor) to Schoodic Point (Winter Harbor) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P13
ME010500021111_SB_EJ_PE	Schoodic Point (Winter Harbor) to Dyer Point (Steuben) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P3-P6
ME010500021304_SB_EG_CAE	Eastern Blue Bay, Newbury Neck to Wonderland (Southwest Harbor) (Conditionally Approved)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section CA1
ME010500021304_SB_EG_PE	Eastern Blue Bay, Newbury Neck to Wonderland (Southwest Harbor) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1, P2
ME010500021403_SB_EI_PE	Great Head (Bar Harbor) to Schoodic Point (Winter Harbor) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1, P2
ME010500021410_SB_EI_CRE	Great Head (Bar Harbor) to Schoodic Point (Winter Harbor) (Conditionally Restricted)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section CR1
ME010500021410_SB_EI_PE	Great Head (Bar Harbor) to Schoodic Point (Winter Harbor) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P3-P12
ME010500021509_SA_EG_PE	Eastern Blue Bay, Newbury Neck to Wonderland (Southwest Harbor) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P4
ME010500021509_SA_EH_PE	Seawall to Otter Cove, Cranberry Islands (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500021509_SB_EF_CAE	Western Blue Hill Bay, Naskeag Point to Newbury Neck (Conditionally Approved)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections CA1, CA2
ME010500021509_SB_EF_PE	Western Blue Hill Bay, Naskeag Point to Newbury Neck (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1-P3

Assessment Unit ID	Segment Name	Cause	Delisting Reason	Comments
ME010500021509_SB_EG_PE	Eastern Blue Bay, Newbury Neck to Wonderland (Southwest Harbor) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P3-P5
ME010500021509_SB_EH_PE	Seawall to Otter Cove, Cranberry Islands (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1-P9
ME010500021601_SA_EA_PE	Dice Head (Castine) to Cape Rosier (Brooksville) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P4
ME010500021602_SA_EA_PE	Dice Head (Castine) to Cape Rosier (Brooksville) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2
ME010500021602_SB_EA_PE	Dice Head (Castine) to Cape Rosier (Brooksville) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1-P3
ME010500021702_SB_EC_PE	Little Deer Isle, incl. Stonington (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P3
ME010500021703_SB_EB_PE	Cape Rosier (Brooksville) to Naskeag Point (Brooklin) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1, P2
ME010500021703_SB_EC_PE	Little Deer Isle, incl. Stonington (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1, P4, P5
ME010500021703_SB_EE_PE	Swans Island and Frenchboro (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1-P3
ME010500021803_SB_WW_PE	Owls Head Light (Owls Head) to Cape Jellison (Stockton Springs) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P3
ME010500021906_SB_WV_PE	Marshall Point (Port Clyde) to Owls Head Light (Owls Head) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P2-P4
ME010500021907_SB_EA_PE	Dice Head (Castine) to Cape Rosier (Brooksville) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P5
ME010500021908_SB_EC_PE	Little Deer Isle, incl. Stonington (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2
ME010500021909_SB_EA_CAE	Dice Head (Castine) to Cape Rosier (Brooksville) (Conditionally Approved)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections CA1, CA2
ME010500021909_SB_WV_PE	Marshall Point (Port Clyde) to Owls Head Light (Owls Head) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1, P5-P18

Assessment Unit ID	Segment Name	Cause	Delisting Reason	Comments
ME010500021909_SB_WW_CAE	Owls Head Light (Owls Head) to Cape Jellison (Stockton Springs) (Conditionally Approved)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections CA1, CA2
ME010500021909_SB_WW_PE	Owls Head Light (Owls Head) to Cape Jellison (Stockton Springs) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P2-P6
ME010500021909_SB_WX_PE	Squaw Point (Stockton Springs) to Dice Head (Castine) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2
ME010500021909_SB_WY_PE	Islesboro (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1-P5
ME010500021909_SB_WZ_PE	North Haven (Vinalhaven), Matinicus Island (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1-P15
ME010500021909_SC_WW_PE	Owls Head Light (Owls Head) to Cape Jellison (Stockton Springs) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1, P2, P6
ME010500030107_SB_WU_CAE	Pleasant Point (Cushing) to Marshall Point (Port Clyde) (Conditionally Approved)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section CA1
ME010500030107_SB_WU_CRE	Pleasant Point (Cushing) to Marshall Point (Port Clyde) (Conditionally Restricted)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section CR1
ME010500030107_SB_WU_PE	Pleasant Point (Cushing) to Marshall Point (Port Clyde) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1-P6
ME010500030202_SB_WT_PE	Martin Point (Friendship) to Pleasant Point (Cushing) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500030203_SB_WS_PE	Pemaquid Point (Bristol) to Martin Point (Friendship) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500030206_SB_WS_PE	Pemaquid Point (Bristol) to Martin Point (Friendship) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P2-P6
ME010500030206_SB_WT_PE	Martin Point (Friendship) to Pleasant Point (Cushing) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P2-P8
ME010500030206_SB_WU_PE	Pleasant Point (Cushing) to Marshall Point (Port Clyde) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P7-P11
ME010500030301_SB_WR_CAE	Shipley Point (South Bristol) to Pemaquid Point (Bristol) (Conditionally Approved)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections CA3, CA4

Assessment Unit ID	Segment Name	Cause	Delisting Reason	Comments
ME010500030301_SB_WR_PE	Shipley Point (South Bristol) to Pemaquid Point (Bristol) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P3
ME010500030303_SB_WR_PE	Shipley Point (South Bristol) to Pemaquid Point (Bristol) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1, P2
ME010500030304_SB_WQ_PE	Ocean Point (Boothbay) to Shipley Point (South Bristol) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1-P5
ME010500030307_SA_WP_PE	Cape Newagen (Southport) to Ocean Point (Boothbay) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500030307_SB_WP_PE	Cape Newagen (Southport) to Ocean Point (Boothbay) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500030307_SB_WQ_PE	Ocean Point (Boothbay) to Shipley Point (South Bristol) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P6
ME010500030307_SB_WR_PE	Shipley Point (South Bristol) to Pemaquid Point (Bristol) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P4-P6
ME010500030404_SB_WN_PE	Indian Point (Georgetown) to Cape Newagen (Southport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500030405_SB_WN_PE	Indian Point (Georgetown) to Cape Newagen (Southport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2
ME010500030502_SB_WN_PE	Indian Point (Georgetown) to Cape Newagen (Southport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P4
ME010500030503_SB_WN_PE	Indian Point (Georgetown) to Cape Newagen (Southport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P3, P5-P20
ME010500030504_SB_WN_PE	Indian Point (Georgetown) to Cape Newagen (Southport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P21
ME010500030602_SB_WM_PE	Small Point (Phippsburg) to Indian Point (Georgetown) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500030603_SB_WM_PE	Small Point (Phippsburg) to Indian Point (Georgetown) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1-P3
ME010500030606_SB_WM_PE	Small Point (Phippsburg) to Indian Point (Georgetown) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P4

Assessment Unit ID	Segment Name	Cause	Delisting Reason	Comments
ME010500040502_SB_ET_PE	Cobscook Bay (Lubec through Perry) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010500040606_SA_ET_PE	Cobscook Bay (Lubec through Perry) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P3
ME010500040606_SB_ET_PE	Cobscook Bay (Lubec through Perry) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2
ME010500040702_SB_EU_PE	St. Croix River; Eastport to Calais (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P2-P4
ME010500040702_SC_EU_PE	St. Croix River; Eastport to Calais (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P4
ME010500040904_SA_ES_PE	Cape Wash (Cutler) to Mowry Point (Lubec) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1-P3
ME010600010205_SB_WI_CAE	McKenney Point (Cape Elizabeth) to Stockbridge Point (Freeport) (Conditionally Approved)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section CA1
ME010600010205_SB_WI_PE	McKenney Point (Cape Elizabeth) to Stockbridge Point (Freeport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1, P2
ME010600010206_SB_WI_CRE	McKenney Point (Cape Elizabeth) to Stockbridge Point (Freeport) (Conditionally Restricted)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section CR1
ME010600010206_SB_WI_PE	McKenney Point (Cape Elizabeth) to Stockbridge Point (Freeport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P3
ME010600010402_SC_WI_PE	McKenney Point (Cape Elizabeth) to Stockbridge Point (Freeport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P10
ME010600010501_SA_WH_PE	Prouts Neck (Scarborough) to McKenney Point (Cape Elizabeth) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010600010502_SC_WG_PE	East Point (Biddeford) to Prouts Neck (Scarborough) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2
ME010600010505_SA_WG_PE	East Point (Biddeford) to Prouts Neck (Scarborough) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1

Assessment Unit ID	Segment Name	Cause	Delisting Reason	Comments
ME010600010507_SB_WG_PE	East Point (Biddeford) to Prouts Neck (Scarborough) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2
ME010600010507_SB_WH_PE	Prouts Neck (Scarborough) to McKenney Point (Cape Elizabeth) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2
ME010600010601_SB_WL_PE	East Cundy Point (Cundys Harbor) to Small Point (Phippsburg) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1-P6
ME010600010602_SB_WJ_PE	Stockbridge Point (Freeport) to Potts Point (Harpswell) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P5
ME010600010603_SB_WJ_CAE	Stockbridge Point (Freeport) to Potts Point (Harpswell) (Conditionally Approved)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections CA1-CA5
ME010600010603_SB_WJ_PE	Stockbridge Point (Freeport) to Potts Point (Harpswell) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P2-P4, P6
ME010600010605_SA_WI_PE	McKenney Point (Cape Elizabeth) to Stockbridge Point (Freeport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P10
ME010600010605_SB_WI_CAE	McKenney Point (Cape Elizabeth) to Stockbridge Point (Freeport) (Conditionally Approved)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections CA2-CA5
ME010600010605_SB_WI_PE	McKenney Point (Cape Elizabeth) to Stockbridge Point (Freeport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P4-P13
ME010600010605_SB_WJ_PE	Stockbridge Point (Freeport) to Potts Point (Harpswell) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1, P7-P11
ME010600010605_SB_WK_PE	Potts Point (Harpswell) to East Cundy Point (Cundys Harbor) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1-P9
ME010600010605_SB_WL_PE	East Cundy Point (Cundys Harbor) to Small Point (Phippsburg) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P7-P10
ME010600010605_SC_WI_PE	McKenney Point (Cape Elizabeth) to Stockbridge Point (Freeport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P10
ME010600021105_SC_WG_PE	East Point (Biddeford) to Prouts Neck (Scarborough) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2
ME010600021106_SB_WG_CAE	East Point (Biddeford) to Prouts Neck (Scarborough) (Conditionally Approved)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section CA1

Assessment Unit ID	Segment Name	Cause	Delisting Reason	Comments
ME010600030207_SB_WD_PE	Bald Head Cliff (York) to Cape Arundel (Kennebunkport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010600030301_SB_WE_PE	Cape Arundel to Little River (Kennebunkport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1, P2
ME010600030303_SB_WE_PE	Cape Arundel to Little River (Kennebunkport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P3, P4
ME010600030303_SB_WF_PE	Little River to East Point (Biddeford) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P1, P2
ME010600031001_SB_WA_PE	Piscataqua River (South Berwick) to Sisters Point (Kittery) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010600031001_SC_WA_PE	Piscataqua River (South Berwick) to Sisters Point (Kittery) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010600031101_SA_WD_PE	Bald Head Cliff (York) to Cape Arundel (Kennebunkport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010600031102_SB_WD_PE	Bald Head Cliff (York) to Cape Arundel (Kennebunkport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P3, P4
ME010600031103_SB_WB_CAE	Sisters Point (Kittery) to East Point (York) (Conditionally Approved)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section CA1
ME010600031103_SB_WB_PE	Sisters Point (Kittery) to East Point (York) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010600031104_SA_WB_PE	Sisters Point (Kittery) to East Point (York) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P3
ME010600031106_SA_WA_PE	Piscataqua River (South Berwick) to Sisters Point (Kittery) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2
ME010600031106_SA_WB_PE	Sisters Point (Kittery) to East Point (York) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2
ME010600031106_SA_WC_PE	East Point (York) to Bald Head Cliff (York) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010600031106_SB_WA_PE	Piscataqua River (South Berwick) to Sisters Point (Kittery) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2

Assessment Unit ID	Segment Name	Cause	Delisting Reason	Comments
ME010600031106_SB_WB_PE	Sisters Point (Kittery) to East Point (York) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P2
ME010600031106_SB_WC_PE	East Point (York) to Bald Head Cliff (York) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Section P1
ME010600031106_SB_WD_PE	Bald Head Cliff (York) to Cape Arundel (Kennebunkport) (Prohibited)	Fecal Coliform	Insufficient data to determine attainment status; correcting original basis for listing	Contains Growing Area Sections P2, P5

TMDL Development Status

Table 8- 14 Rivers/Streams TMDL Current Project Update

Waters that are included in Maine's 303(d) Vision are indicated in italics. New listings are shown in bold. DEP is in the process of hiring a TMDL writer (January 2022). Once the position has been filled, all waters requiring TMDLs will be assessed and new TMDL priorities assigned.

Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Priority
ME0101000105_103R01	Shields Branch of Big Black R	Mainstem	Dissolved Oxygen	11/10/2014: Need more data.	L
ME0101000303_123R01	**North Fork McLean Brook**	**St Agatha, tributary to Fish River via Long Lake**	**Benthic Macroinvertebrates Bioassessments**	**11/29/21: New listing, not started.**	**L**
ME0101000303_123R01	**North Fork McLean Brook**	**St Agatha, tributary to Fish River via Long Lake**	**Periphyton (Aufwuchs) Indicator Bioassessments**	**11/29/21: New listing, not started.**	**L**
ME0101000412_140R01	No. Br. Presque Isle Stream between Mapleton and Presque Isle	From Mapleton Sewer District outfall to confluence with Presque Isle Stream	DDT	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0101000412_140R03_02	N Br Presque Isle Stream	Tributary to Presque Isle Stream	DDT	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L

Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Priority
ME0101000412_140R04	Unnamed Stream (P.I. airport) - 'Hanson Brook, BioSta 743'	Tributary to Presque Isle Stream, draining the airport	Benthic Macroinvertebrates Bioassessments	11/26/21: Resampling needed to determine current conditions	L
ME0101000412_140R04	Unnamed Stream (P.I. airport) - 'Hanson Brook, BioSta 743'	Tributary to Presque Isle Stream, draining the airport	Periphyton (Aufwuchs) Indicator Bioassessments		L
ME0101000412_141R01	**Birch Brook (Presque Isle)**	**Tributary to Aroostook River**	**Periphyton (Aufwuchs) Indicator Bioassessments**	**10/23/21: New listing, not started.**	**L**
ME0101000412_143R04	**Cowett Brook (Ft. Fairfield)**	**Tributary to Aroostook River**	**Benthic Macroinvertebrates Bioassessments**	**10/23/21: New listing, not started.**	**L**
ME0101000412_143R04	**Cowett Brook (Ft. Fairfield)**	**Tributary to Aroostook River**	**Periphyton (Aufwuchs) Indicator Bioassessments**		
ME0101000412_143R05	**Unnamed Brook (Presque Isle)**	**Tributary to Aroostook River (at Parkhurst)**	**Periphyton (Aufwuchs) Indicator Bioassessments**	**10/23/21: New listing, not started.**	**L**
ME0101000413_144R01	**Amsden Brook (Ft. Fairfield)**	**Tributary to Aroostook River**	**Periphyton (Aufwuchs) Indicator Bioassessments**	**10/23/21: New listing, not started.**	**L**
ME0101000413_144R01	**Amsden Brook (Ft. Fairfield)**	**Tributary to Aroostook River**	**Periphyton (Aufwuchs) Indicator Bioassessments**		
ME0101000413_144R02	**Hacker Brook (Ft. Fairfield)**	**Tributary to Aroostook River**	**Periphyton (Aufwuchs) Indicator Bioassessments**	**10/23/21: New listing, not started.**	**L**
ME0101000413_144R03	**Gray Brook (Ft. Fairfield)**	**Tributary to Aroostook River**	**Periphyton (Aufwuchs) Indicator Bioassessments**	**10/23/21: New listing, not started.**	**L**
ME0101000413_148R	Aroostook River	Main stem between confluence with Presque Isle Stream and 3 miles upstream of Caribou water supply intake	pH	9/2/2015: Feasibility of reducing nutrient loadings via permit requirements and Best Management Practices is being assessed.	L

Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Priority
ME0101000413_148R01	Aroostook River (Caribou)	Main stem between 3 miles upstream of Caribou water supply intake and 100 yards downstream of intake	pH	9/2/2015: Feasibility of reducing nutrient loadings via permit requirements and Best Management Practices is being assessed.	L
ME0101000413_148R02	Aroostook River	Main stem between 100 yards downstream of Caribou water supply intake and international boundary	pH	9/2/2015: Feasibility of reducing nutrient loadings via permit requirements and Best Management Practices is being assessed.	L
ME0101000501_149R	Minor tributaries to Prestile Stream above dam in Mars Hill		DDT	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0101000501_149R01	Prestile Stream above dam in Mars Hill	Including Christina Reservoir	DDT	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0101000501_150R	Tributaries to Prestile Str entering below dam in Mars Hill		DDT	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0101000501_150R01	Prestile Stream below dam in Mars Hill	From Mars Hill dam (Rt 1A) to international border	DDT	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0101000501_150R02	**Rocky Brook**	**Mars Hill, tributary to Prestile Stream**	**Periphyton (Aufwuchs) Indicator Bioassessments**	**11/16/21: New listing, not started.**	**L**
ME0101000504_152R01_01	Meduxnekeag River	From confluence with S Branch to biomonitoring station S-364	DDT	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0101000504_152R01_03	Meduxnekeag River	From biomonitoring station S-364 to border	DDT	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0101000504_152R03	**Oliver Brook**	**Including tributaries; tributaries to Meduxnekeag River**	**Periphyton (Aufwuchs) Indicator Bioassessments**	**11/16/21: New listing, not started.**	**L**

Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Priority
ME0101000504_152R04	**Smith Brook and tributaries (Houlton)**	**Tributaries to Meduxnekeag River (waters in Maine)**	**Periphyton (Aufwuchs) Indicator Bioassessments**	**12/20/21: New listing, not started.**	**L**
ME0102000402_219R01	*Piscataquis R*	*Main stem, Dover-Foxcroft POTW outfalls to about 4 miles upstream of confluence with Sebec River*	*Dissolved Oxygen*	*11/15/21: Permit (likely with new Total Phosphorus discharge limit) expected to be renewed in 2021. Delist to Category 4-B in 2024 cycle.*	*L*
ME0102000404_216R01_01	W. Br. Pleasant R (KIW Twp)	Below Silver Lake	Iron	11/26/21: A 2020 Screening Investigation indicated that high iron concentrations are due to the presence of acid rock drainage impacts (from historic mining activities) affecting Blood Brook and this segment of the West Branch Pleasant River downstream.	L
ME0102000404_216R01_02	Blood Bk (KIW Twp)	Tributary to West Branch Pleasant River	Iron	11/26/21: A 2020 Screening Investigation indicated that high iron concentrations are due to the presence of acid rock drainage impacts from historic mining activities.	L
ME0102000502_231R	Penobscot R	Main stem, from Cambolasse Str to Piscataquis R	Polychlorinated biphenyls	11/25/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0102000506_222R01	Costigan Brook (Milford)	Tributary to Penobscot River	Dissolved Oxygen	11/20/2014: Low DO may be due to natural causes (wetlands); mostly forested watershed.	L
ME0102000506_232R	Penobscot R	Main stem, from Piscataquis R to Orson Is	Polychlorinated biphenyls	11/25/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0102000509_233R_01	Penobscot R	Main stem, from Orson Is to Veazie Dam, incl. the Stillwater River	Polychlorinated biphenyls	11/25/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0102000511_225R02	Sucker Brook (Hampden) (formerly	Tributary to Penobscot R. entering from the west, in Hampden	Periphyton (Aufwuchs) Indicator Bioassessments	6/3/2014: Algae (periphyton) impairment due to urban influence addressed in % Impervious Cover	L

Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Priority
	'Unnamed St.-Hampden')			TMDL (approved 9/27/2012). Impairment due to agricultural influences will be addressed separately.	
ME0102000513_226R03	*Penjajawoc Stream (Bangor) Meadow Bk (Bangor)*	*Tributaries to Penobscot River*	*Benthic Macroinvertebrates Bioassessments*	*11/26/21: To be included in % Impervious Cover TMDL in 2022.*	*H*
ME0102000513_226R03	*Penjajawoc Stream (Bangor) Meadow Bk (Bangor)*	*Tributaries to Penobscot River*	*Habitat Assessment (Streams)*		*H*
ME0102000513_226R03	*Penjajawoc Stream (Bangor) Meadow Bk (Bangor)*	*Tributaries to Penobscot River*	*Dissolved Oxygen*		*H*
ME0102000513_226R03	***Penjajawoc Stream (Bangor) Meadow Bk (Bangor)***	***Tributaries to Penobscot River***	***Periphyton (Aufwuchs) Indicator Bioassessments***		***H***
ME0102000513_234R02	Penobscot	Main stem, Veazie Dam to Reeds Bk	Polychlorinated biphenyls	11/25/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0103000305_322R01	Perkins Stream (Waterville)	Tributary to Messalonskee Stream	Benthic Macroinvertebrates Bioassessments	11/1/2016: New listing, not started.	L
ME0103000305_322R01	Perkins Stream (Waterville)	Tributary to Messalonskee Stream	Periphyton (Aufwuchs) Indicator Bioassessments		L
ME0103000306_314R02	Cold Brook (Skowhegan)	Tributary to Wesserunsett Stream	Benthic Macroinvertebrates Bioassessments	10/30/21: Not started	L
ME0103000306_320R04	Mill Stream (Norridgewock)	Tributary to Kennebec River	Benthic Macroinvertebrates Bioassessments	11/20/2014: Do Mapshed analyses to aid in determination of source of impairment.	L
ME0103000306_338R_01	Kennebec R,	Main stem between Mill Str., Norridgewock, and Weston Dam	Polychlorinated biphenyls	11/12/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0103000306_338R_04	Kennebec R,	Main stem, from Carrabassett R to Fairfield-	Polychlorinated biphenyls	11/12/21: This legacy pollutant cannot be addressed with a TMDL or	L

Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Priority
		Skowhegan boundary (excluding Mill Str., Norridgewock, to Weston Dam)		permit. Pollutant effects will continue to diminish naturally over time.	
ME0103000306_339R_01	Kennebec R,	Shawmut Dam	Polychlorinated biphenyls	11/12/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0103000306_339R_02	Kennebec R,	Main stem, from Fairfield-Skowhegan boundary to Sebasticook R	Polychlorinated biphenyls	11/12/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0103000307_330R	W Branch of Sebasticook R	Main stem, below Rt. 23 bridge in Hartland	Dioxin (including 2,3,7,8-TCDD)	TMDL not started	L
ME0103000307_330R	W Branch of Sebasticook R	Main stem, below Rt. 23 bridge in Hartland	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0103000308_325R01	East Branch Sebasticook River Corundel L to Sebasticook L	Corinna Superfund site	Dioxin (including 2,3,7,8-TCDD)	10/13/21: These legacy pollutants cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0103000308_325R01	East Branch Sebasticook River Corundel L to Sebasticook L	Corinna Superfund site	Polychlorinated biphenyls		
ME0103000308_331R	E Branch of Sebasticook R	Main stem, below Sebasticook Lake	Dissolved Oxygen	10/13/21: DO sampling planned for 2022.	L
ME0103000308_331R	E Branch of Sebasticook R	Main stem, below Sebasticook Lake	Phosphorus (Total)		L
ME0103000308_331R	E Branch of Sebasticook R	Main stem, below Sebasticook Lake	Dioxin (including 2,3,7,8-TCDD)	10/13/21: These legacy pollutants cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0103000308_331R	E Branch of Sebasticook R	Main stem, below Sebasticook Lake	Polychlorinated biphenyls		
ME0103000308_331R01	Martin Stream (Dixmont)	Tributary to East Branch Sebasticook	Ammonia (Un-ionized)	11/1/2016: New listing, not started.	L

Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Priority
ME0103000308_331R01	Martin Stream (Dixmont)	Tributary to East Branch Sebasticook	Benthic Macroinvertebrates Bioassessments		L
ME0103000308_331R01	Martin Stream (Dixmont)	Tributary to East Branch Sebasticook	Periphyton (Aufwuchs) Indicator Bioassessments		L
ME0103000308_331R02	Martin Stream (Dixmont)	Trib to East Br. Sebasticook R, below Mitchell Rd	Benthic Macroinvertebrates Bioassessments	11/1/2016: New listing, not started.	L
ME0103000308_331R02	Martin Stream (Dixmont)	Trib to East Br. Sebasticook R, below Mitchell Rd	Periphyton (Aufwuchs) Indicator Bioassessments		L
ME0103000308_332R	Sebasticook R	Main stem, from E and W Branches to Burnham bridge, including Burnham impoundment	Dioxin (including 2,3,7,8-TCDD)	Low priority	L
ME0103000308_332R	Sebasticook R	Main stem, from E and W Branches to Burnham bridge, including Burnham impoundment	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0103000309_328R01	China Lake Outlet Stream (Vassalboro, Winslow)	Tributary to Sebasticook River (in Winslow)	Periphyton (Aufwuchs) Indicator Bioassessments	12/27/21: Resample – potential candidate for delisting.	L
ME0103000309_332R	Sebasticook River	Main stem, from Burnham bridge to Kennebec R (excluding site of former Halifax Impd)	Dioxin (including 2,3,7,8-TCDD)	Legacy upstream sources (W. Br. Sebasticook) 5-D	L
ME0103000309_332R	Sebasticook River	Main stem, from Burnham bridge to Kennebec R (excluding site of former Halifax Impd)	Dissolved Oxygen	10/19/2011: Impairment likely due to Benton impoundment; good candidate for monitoring to confirm or reject continued DO impairment. No recent monitoring data.	L
ME0103000309_332R	Sebasticook River	Main stem, from Burnham bridge to Kennebec R (excluding site of former Halifax Impd)	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L

Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Priority
ME0103000309_332R01	Sebasticook River (site of former Halifax impoundment)	Tributary to Kennebec River	Dioxin (including 2,3,7,8-TCDD)	Low priority	L
ME0103000309_332R01	Sebasticook River (site of former Halifax impoundment)	Tributary to Kennebec River	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0103000311_334R04	Mill Stream (Winthrop)	Between Maranacook and Annabessacook Lakes	Benthic Macroinvertebrates Bioassessments	6/11/2012: TMDL monitoring in 2005 & 2010, EPA assistance monitoring 2010; biomonitoring in 2004; toxic spill probable source.	L
ME0103000311_334R04	Mill Stream (Winthrop)	Between Maranacook and Annabessacook Lakes	Cause Unknown		L
ME0103000311_334R05	Cobbosseecontee Stream (Gardiner)	Tributary to Kennebec River, from outlet of Pleasant Pond to Kennebec R.	Benthic Macroinvertebrates Bioassessments	11/4/2014: Not started.	L
ME0103000311_334R05	Cobbosseecontee Stream (Gardiner)	Tributary to Kennebec River, from outlet of Pleasant Pond to Kennebec R.	Periphyton (Aufwuchs) Indicator Bioassessments	12/27/21: Resample – potential candidate for delisting.	L
ME0103000312_333R01_02	Bond Brook mainstem	From confluence of Spring and Tanning Brook to tidal influence	Periphyton (Aufwuchs) Indicator Bioassessments	6/6/2014: Not started.	L
ME0103000312_335R03	Meadow Brook (Farmingdale)	Tributary to Kennebec River	Benthic Macroinvertebrates Bioassessments	11/21/2014: No new data, probably due to habitat and flow, low priority for TMDL.	L
ME0103000312_339R_01	Kennebec R,	Main stem, from Sebasticook R to Augusta (Calumet Bridge)	Polychlorinated biphenyls	11/12/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0103000312_340R_01	Kennebec R,	Main stem, from Augusta (Calumet Bridge) to Merrymeeting Bay (Chops)	Polychlorinated biphenyls	11/12/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0103000312_427R	Merrymeeting Bay	including tidal portions of tributaries from the Androscoggin R to The Chops	Polychlorinated biphenyls	11/12/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L

Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Priority
ME0103000324_333R_01	Riggs Brook (Augusta)	Augusta, including portions of tribs affected by watershed development	Benthic Macroinvertebrates Bioassessments	6/9/2014: Not started, needs more assessment of potential stressors and sources.	L
ME0103000324_333R_01	Riggs Brook (Augusta)	Augusta, including portions of tribs affected by watershed development	Periphyton (Aufwuchs) Indicator Bioassessments		L
ME0103000324_333R_01	Riggs Brook (Augusta)	Augusta, including portions of tribs affected by watershed development	Phosphorus (Total)		L
ME0103000324_333R_02	Spring Brook (Augusta)	From Gov Hill fish hatchery to Mt Vernon Rd, Augusta	Benthic Macroinvertebrates Bioassessments	12/28/21: Assessment needed.	L
ME0103000324_333R_02	Spring Brook (Augusta)	From Gov Hill fish hatchery to Mt Vernon Rd, Augusta	Phosphorus (Total)		L
ME0104000201_421R	Androscoggin R	Main stem, from Maine-NH border to Wild R	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0104000202_421R	Androscoggin R	Main stem, from Wild R to Rumford Point	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0104000204_421R	Androscoggin R	Main stem, from Rumford Pt to Virginia Bridge	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0104000204_422R	Androscoggin R	Main stem, from Virginia Bridge to Webb R	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0104000205_410R01_02	Whitney Brook (Canton)	From Lake Anasagunticook Dam to Androscoggin River	Benthic Macroinvertebrates Bioassessments	12/28/21: Needs resampling to determine current conditions.	L
ME0104000205_422R	Androscoggin R	Main stem, Webb R to Riley dam	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L

Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Priority
ME0104000206_423R	Androscoggin R	Main stem, from Riley Dam to Nezinscot R	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0104000206_423R01	Androscoggin R	Main stem, Livermore impoundment	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0104000208_413R01	Jepson Brook (Lewiston)	Tributary to Androscoggin River	Benthic Macroinvertebrates Bioassessments	6/11/2012: Develop TMDL as precursor to potential Use Attainability Analysis.	L
ME0104000208_413R01	Jepson Brook (Lewiston)	Tributary to Androscoggin River	Habitat Assessment (Streams)		L
ME0104000208_413R01	Jepson Brook (Lewiston)	Tributary to Androscoggin River	Dissolved Oxygen		L
ME0104000208_413R07	Gully Brook (Auburn)	Tributary to Androscoggin River	Dissolved Oxygen	5/29/2012: Mostly urban: include in future % Impervious Cover TMDL.	L
ME0104000208_413R07	**Gully Brook (Auburn)**	**Tributary to Androscoggin River**	**Benthic Macroinvertebrates Bioassessments**	**9/21/21: New listing, not started.**	**L**
ME0104000208_413R07	**Gully Brook (Auburn)**	**Tributary to Androscoggin River**	**Periphyton (Aufwuchs) Indicator Bioassessments**		**L**
ME0104000208_424R	Androscoggin R,	Main stem, from confluence of Nezinscot R to confluence with Little Androscoggin R, except Gulf Island Pond	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0104000208_424R_01	Androscoggin R, GIP	Main stem, upstream of the Gulf Island Dam	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0104000210_418R01	Sabattus River between Sabattus P and Androscoggin R	From Sabattus Pond to limits of Lisbon urban area	Nutrient/Eutrophica-tion Biological Indicators	11/4/2014: Sabattus Pond eutrophic and source of SOD in river; lake TMDL complete 2004; slow recovery is expected.	L
ME0104000210_418R01	Sabattus River between Sabattus P and Androscoggin R	From Sabattus Pond to limits of Lisbon urban area	Dissolved Oxygen		L

Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Priority
ME0104000210_418R03	Sabattus River between Sabattus P and Androscoggin R	From limits of Lisbon urban area to Androscoggin R	Benthic Macroinvertebrates Bioassessments	11/4/2014: Effects from legacy pollutants, habitat and development as well as nutrients/DO on macroinvertebrates.	L
ME0104000210_418R03	Sabattus River between Sabattus P and Androscoggin R	From limits of Lisbon urban area to Androscoggin R	Nutrient/Eutrophica-tion Biological Indicators	11/4/2014: Sabattus Pond eutrophic and source of SOD in river; lake TMDL complete 2004; slow recovery is expected.	L
ME0104000210_418R03	Sabattus River between Sabattus P and Androscoggin R	From limits of Lisbon urban area to Androscoggin R	Dissolved Oxygen		L
ME0104000210_419R03	Unnamed Stream (Lewiston Municipal Landfill)	Biomon Sta 857 affected by Lewiston Municipal Landfill near Plourde Pky	Benthic Macroinvertebrates Bioassessments	11/21/2014: Not started.	L
ME0104000210_419R03	**Unnamed Stream (Lewiston Municipal Landfill)**	**Biomon Sta 857 affected by Lewiston Municipal Landfill near Plourde Pky**	**Periphyton (Aufwuchs) Indicator Bioassessments**	**11/21/2014: New listing, not started.**	**L**
ME0104000210_425R_01	Androscoggin R,	Main stem, from L Androscoggin R to Pejepscot Dam	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0104000210_425R_01_01	Androscoggin R,	Main stem, from Pejepscot Dam to Brunswick Dam	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0104000210_426R	Androscoggin R	Main stem, from Brunswick Dam to Brunswick-Bath boundary	Polychlorinated biphenyls	10/13/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0105000209_512R_02	McCoy Brook (Deblois)	Tributary to Narraguagus River	Benthic Macroinvertebrates Bioassessments	12/28/21: Need to resolve access issue to enable resampling.	L
ME0105000209_512R_02	McCoy Brook (Deblois)	Tributary to Narraguagus River	pH		L
ME0105000209_512R_03	Great Falls Branch, Schoodic Stream (Deblois)	Tributary to Narraguagus River	Benthic Macroinvertebrates Bioassessments	12/28/21: Candidate for future delisting.	L

Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Priority
ME0105000305_528R02	West Branch Sheepscot River	Below Halls Corner, Rt 17/32	Periphyton (Aufwuchs) Indicator Bioassessments	12/28/21: TMDL delayed.	L
ME0105000305_528R05	**Meadow Bk (China)**	**Tributary to West Branch Sheepscot River**	**Escherichia coli**	**12/30/21: New listing, not started.**	**M**
ME0105000305_528R07	**Choate Bk (Windsor)**	**Tributary to West Branch Sheepscot River**	**Escherichia coli**	**12/30/21: New listing, not started.**	**M**
ME0105000305_528R08_01	**Chamberlain Bk (Whitefield)**	**Tributary to Sheepscot River**	**Escherichia coli**	**12/30/21: New listing, not started.**	**M**
ME0106000102_603R06	Cole Brook (Gray)	Tributary to Collyer Brook and Royal River	Benthic Macroinvertebrates Bioassessments	12/28/21: Low priority, macroinvertebrates met class in 2015.	L
ME0106000103_607R01	Black Brook (Windham)	Tributary to Presumpscot River	Escherichia coli	12/28/21: Will be included in next update to statewide bacteria TMDL.	M
ME0106000105_610R02	Clark Brook (Westbrook)	Tributary to Stroudwater River	Dissolved Oxygen	12/28/21: Needs assessment.	L
ME0106000105_610R04	Stroudwater River (Portland, Westbrook)	Tributary to Fore River and Casco Bay	Dissolved Oxygen	12/28/21: Needs more assessment.	L
ME0106000105_610R07	Red Brook (Scarborough, S Portland)	Tributary to Long Creek	Polychlorinated biphenyls	10/31/21: This legacy pollutant cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0106000105_610R08	Fall Bk (Portland)	Tributary to Back Cove and Casco Bay	Habitat Assessment	6/11/2012: Develop TMDL as precursor to potential Use Attainability Analysis	L
ME0106000106_602R03	Concord Gully (Freeport)	Tributary to Harraseeket River	Escherichia coli	12/28/21: Will be included in next update to statewide bacteria TMDL.	M
ME0106000106_616R04	**Bear Bk**	**Saco, tributary to Goosefare Brook**	**Benthic Macroinvertebrates Bioassessments**	**10/20/21: New listing, not started.**	L
ME0106000106_616R04	**Bear Bk**	**Saco, tributary to Goosefare Brook**	**Habitat Assessment**	**10/20/21: New listing, not started.**	L
ME0106000210_615R01	Little Ossipee R	Segment from Lake Arrowhead (Ledgemere) Dam to Saco River	Benthic Macroinvertebrates Bioassessments	12/28/21: Macroinvertebrates met in last 2 sampling events; low priority.	L
ME0106000210_615R01	Little Ossipee R	Segment from Lake Arrowhead (Ledgemere) Dam to Saco River	Dissolved Oxygen	12/28/21: New data needed.	L

Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Priority
ME0106000210_615R02	Brown Brook (Limerick)	Sokokis Lake to Lake Arrowhead	Benthic Macroinvertebrates Bioassessments	11/20/2014: Not started.	L
ME0106000210_615R02	Brown Brook (Limerick)	Sokokis Lake to Lake Arrowhead	Habitat Assessment (Streams)		L
ME0106000211_616R	*Wales Pond Brook (Hollis)*	*Tributary to Saco River*	*Benthic Macroinvertebrates Bioassessments*	*11/4/2015: Permit was renewed in June 2015. Segment is candidate for moving to Category 4-B in 2016 cycle.*	*L*
ME0106000303_624R01	Stevens Brook (Wells, Ogunquit)	Only portion flowing in westerly-to-easterly direction, to start of wetland section	Benthic Macroinvertebrates Bioassessments	12/28/21: New data needed.	L
ME0106000304_625R03	West Brook (N. Berwick)	From 0.1 miles above Bragdon Rd to confluence with Great Works River	1,1-Dichloroethane	5/29/2012: Remediation of original contaminant source has occurred; attenuation of contaminant concentration expected over time; monitoring continues.	L
ME0106000304_625R03	West Brook (N. Berwick)	From 0.1 miles above Bragdon Rd to confluence with Great Works River	1,2-Dichloroethane		L
ME0106000305_630R01	Salmon Falls R	Main stem, from Route 9 to tidewater	Dioxin (including 2,3,7,8-TCDD)	10/13/21: These legacy pollutants cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0106000305_630R01	Salmon Falls R	Main stem, from Route 9 to tidewater	Polychlorinated biphenyls		L

Table 8- 15 Lakes/Ponds TMDL Current Project Update

Waters that are included in Maine's 303(d) Vision are indicated in italics

HUC	Lake	MIDAS	Cause	Project Status	TMDL Priority
ME0102000513	Alamoosook Lake	4336	Total phosphorus; Secchi disk transp.	Negotiations to remove Federal fish hatchery discharge underway	H
ME0103000310	*Great Pond*	*5274*	*Total phosphorus; Secchi disk transp.*	*Watershed-based Management Plan accepted by EPA in September 2021 as an Alternative Restoration Plan*	*L*
ME0103000311	Cochnewagon Pond	3814	Total phosphorus; Secchi disk transp.	Received an alum treatment in 2019; water quality improvements may result in future delisting	L

Table 8- 16 Wetland TMDL Current Project Update

Assessment Unit ID	AU Name	Location Description	Cause	Project Status	TMDL Priority
ME0101000501_149R_W200	Tributary wetlands to Prestile Stream above dam in Mars Hill	Includes site W-200	DDT	Thise legacy pollutant cannot be addressed with a TMDL or permit. Effects of this pollutant will continue to diminish naturally over time.	L
ME0101000501_149R01_W203	Prestile Stream wetlands above dam in Mars Hill	Including sites W-203 and W-204	DDT	This legacy pollutant cannot be addressed with a TMDL or permit. Effects of this pollutant will continue to diminish naturally over time.	L
ME0103000308_325R01_W080	East Branch Sebasticook River Wetland	Between Corundel Pond and Sebasticook Lake, wetland site W-080	Dioxin (including 2,3,7,8-TCDD)	These legacy pollutants cannot be addressed with a TMDL or permit. Pollutant effects will continue to diminish naturally over time.	L
ME0103000308_325R01_W080	East Branch Sebasticook River Wetland	Between Corundel Pond and Sebasticook Lake, wetland site W-080	Polychlorinated biphenyls		L
ME0101000501_150R01_W198	Robinson Dam Pond wetlands	Blaine, Wetland station W-198	Benthic Macroinvertebrates Bioassessments	Not started	L
ME0104000210_418R01_W188	Sabattus River Wetland, between Sabattus P and Rt 126	Wetland site W-188, between Sabattus Pond and Rt 126 in Sabattus	Benthic Macroinvertebrates Bioassessments	5/1/12: Sabattus Pond eutrophic and source of SOD in river; lake TMDL complete 2004; slow recovery expected. Updated, revised modeling report completed 2006	L
ME0104000210_418R02_W101	No Name Brook (Lewiston) wetland	Wetlands along No Name Brook in Lewiston, includes biomonitoring station W-101 and W-102	Benthic Macroinvertebrates Bioassessments	Not started	L
ME0106000302_628R01_02_W054	Unnamed tributary wetland to Mousam River, Sanford	Wetland Station W-054	Benthic Macroinvertebrates Bioassessments	Not started	L

Table 8- 17 Estuarine/Marine Current TMDL Project Update

Assessment Unit ID[1]	Water body ID	Segment Description	Cause	Project Status	TMDL Priority
ME010600010206_SB_01E	802-25	Royal River Estuary	Dissolved Oxygen	Removed from TMDL Vision due to natural conditions contributing to non-attainment. Delisting may be sought in future cycle.	L
ME010600010402_SC_01E	804-7	Fore R. Estuary	Marine life, Toxics	Further data collection required	L
ME010600021105_SC_01E	811-8	Saco R. Estuary	Toxicity, Copper	Further data collection required	L
ME010600030205_SB_01E	811-9	Mousam River	Dissolved Oxygen	Further data collection required, anticipated in 2022.	L
ME010600031001_SB_01E	812-2	Piscataqua R. Estuary (Eliot, Kittery)	Nutrient/ Eutrophication Biological Indicators	TMDL dictated by NH licensing and ME nitrogen criteria development processes.	L
ME010600031001_SC_01E	812-3	Piscataqua R. Estuary (Eliot, Kittery)	Nutrient/ Eutrophication Biological Indicators	TMDL dictated by NH licensing and ME nitrogen criteria development processes.	L
ME010600031001_SB_02E	812-3	Portsmouth Harbor (south and west of Gerrish Island)	Unknown	TMDL contingent on identification of impairment cause(s)	L

[1] Assessment Unit ID field new for this reporting cycle. Waterbody ID column from 2016 IR table will be retired in subsequent cycle.

As indicated in Notes prior to Category 5-B-1 tables, a major revision to the 2009 Statewide Bacteria TMDL is anticipated based on the updating and relocation of marine/estuarine water segments in this report that pertain to shellfish harvest closure areas. As soon as permissable, the revision will encompass all current closure areas pertaining to the most recent report and DMR closure information. The priority level for the bacteria TMDL update is Medium.

Table 8- 18 Coastal Designated Beaches TMDL Current Project Update

Assessment Unit ID	AU Name	Cause	Project Status	TMDL Priority
ME010600030303_SB_345424B	Goose Rocks - Batson River (Kennebunkport)	Enterococci	12/10/21: New listing, not started.	M
ME010600030303_SB_793244B	Goose Rocks - Little River (Kennebunkport)	Enterococci	12/10/21: New listing, not started.	M
ME010600031102_SB_794778B	Riverside (Ogunquit)	Enterococci	12/10/21: New listing, not started.	M

CHAPTER 9 ACCESSING AND MANAGING DATA USED IN MAKING DECISIONS ON STATUS OF WATERS

MAINE DEP QUALITY MANAGEMENT SYSTEM

Contact: Kevin Martin, DEP, Interim Quality Assurance Manager (QAM), Office of the Commissioner

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Related Website: www.maine.gov/dep/about/planning.html

Data used in making decisions on the status of Maine waters are collected, analyzed, and evaluated according to the standards contained in the Department's Quality Management Plan (QMP, current version May 2021). The QMP applies to all program areas and activities in the DEP to ensure that data quality is maintained. In 2017, the QMP received a five year approval from EPA R1.

Two tools are used to document Quality Assurance and Quality Control (QA/QC) activities, Standard Operating Procedures (SOP) and Quality Assurance Project/ Program Plans (QAPP).

SOPs, which are included in most QAPPs applicable to environmental data gathering and analysis, contain a set of written instructions that document routine or repetitive activities. The use of an SOP ensures conformance with quality system requirements and thus high data quality. SOPs are included in all QAPPs used for environmental data gathering and analysis. To maintain their integrity, SOPs are reviewed each year by DEP program staff.

A QAPP is a broader document that outlines the procedures used to conduct a monitoring project to ensure that the data collected meets project requirements. It is an invaluable planning and operating tool that outlines the project's methods of data collection, storage and analysis. QAPPs also receive an annual quality review by DEP program staff, and are renewed at 5-year intervals.

The QA/QC requirements in the QMP also apply to projects carried out by entities other than the DEP. To ensure data QA/QC for water quality sampling and monitoring activities carried out by non-DEP organizations, the Department monitors data quality through the review and approval of QAPPs submitted by these organizations.

ENVIRONMENTAL AND GEOGRAPHIC ANALYSIS DATABASE (EGAD)

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Related Websites: www.maine.gov/dep/maps-data/egad/index.html and

www.maine.gov/dep/gis/datamaps/index.html (for access to DEP data via Google Earth or ArcGIS Online projects on the internet)

The DEP Environmental and Geographic Analysis Database (EGAD) stores site and water quality information in a relational database using Oracle technology, and spatial locations using Environmental Systems Research Institute (ESRI) Spatial Database Engine (SDE) software. The database includes data from groundwater and surface water samples as well as sediment and biological samples and other pertinent information. To date (December 2020), data from the following DEP programs involved in monitoring activities has been incorporated: Environmental Geology, Biological

Monitoring, SWAT (Surface Water Ambient Toxics; freshwater and marine), Rivers-Stream TMDL, Rivers-Engineering, Salmon Habitat, Marine, Volunteer River Monitoring Program (VRMP), Aquaculture, and Maine Healthy Beaches; data from the Lakes Assessment section has been partly incorporated. There are a total of 14.6 million samples from a total of 25,531 sampling sites in the database, each of which has one to many results records; ~6.9 million of these samples are used in water quality assessments in general. For each year covered by this report (2013-2020), an average of 360 groundwater sites and 150 surface water sites were added to the database.

Data collected by DEP staff or submitted by contractors or laboratories are loaded to EGAD using a standard EDD (Electronic Data Deliverable) which offers automated quality control. The EGAD system allows complete integration of all data via spatial relationships. Database functionalities exist to assess trends in water quality information, satisfy requests for data, assist in answering inquiries, provide automated analysis, and enable customized reporting and map-making. The database allows rapid access to information, which is critical for emergency response to hazardous materials spills. DEP staff can also geo-locate, browse and access all EGAD data together with related site and monitoring information on the internet via several Google Earth or ArcGIS Online projects. The ability to access a large variety of data quickly, easily and in a number of different formats allows staff to identify resources that require protection, such as lakes or streams, or municipal or private wells, and to target monitoring efforts.

Water quality assessment results have historically been stored in Maine's version of the EPA Assessment Database (ADB). Beginning with the 2018/2020/2022 cycle, assessments results will be stored in the EPA Assessment and Total Maximum Daily Load Tracking and Implementation System (ATTAINS). DEP aims to have all raw water quality data in support of the Integrated Report stored in EGAD.

Since 2008, Maine water quality data stored in EGAD have been exported to national EPA databases (WQX, PRAWN) via the Central Data Exchange (CDX) system; to date data from the SWAT (freshwater and marine), Rivers-Stream TMDL, Rivers-Engineering, Biological Monitoring and Maine Healthy Beaches programs have been transferred to WQX/PRAWN. Since 2015, continuous temperature data stored in EGAD have been exported to the Spatial Hydro-Ecological Decision System (SHEDS) database.

WATER QUALITY MONITORING AND REPORTING UTILIZING GIS AND THE NATIONAL HYDROGRAPHY DATASET

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The BWQ is highly active in designing, creating, and maintaining hydrologic and terrestrial spatial data for use in water quality decision-making programs for the State of Maine. Since 2011, the Bureau's objective has been to establish and maintain the National Hydrography Dataset (NHD) as Maine's primary surface water dataset. The BWQ has a staff person who serves as a state NHD data steward. NHD stewards are responsible for identifying needed corrections to the NHD layers and incorporating them into the national dataset using GIS tools. Working collaboratively with additional

DEP GIS staff, BWQ is incorporating water quality information into an NHD-compatible format. By using the NHD with NHD-compatible data it is possible to study relationships between surface waters and other features within the linked datasets. To promote use of the NHD, staff has created on-line tutorials for both internal and external users of the NHD (www.maine.gov/megis/pdfs/nhd_training_session.pdf).

The NHD is accessible in several formats from the United States Geological Survey (USGS; National Hydrography Products). Annually, DEP acquires updated versions of the NHD for use in its water quality monitoring activities. The DEP and BWQ are responsible for disseminating spatial components of water quality information and analysis activities. To meet this requirement, spatial data sets developed using the NHD representing Maine's water quality standards and current status are hosted on the ArcGIS Online platform and can accessed through the Maine DEP GIS and Data webpage. These include web applications showing Maine's current draft Integrated Report waters, and Water Quality Classifications.

These programs will ensure easy access and retrieval of water quality information for DEP users as well as State and national users of Maine's GIS water quality information.

LISTINGS OF INDIVIDUAL WATERS

See Appendices II through VI (separate document) for listing information on specific waters. Appendices include assessments for rivers/streams, lakes, wetlands, estuarine/marine waters, and coastal, designated beaches.