

# **NASHUA RIVER WATERSHED 2003 WATER QUALITY ASSESSMENT REPORT**

**COMMONWEALTH OF MASSACHUSETTS**  
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NASHUA RIVER WATERSHED  
2003 WATER QUALITY ASSESSMENT REPORT

Prepared by:

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Division of Watershed Management

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### Regional

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**ATTACHED DATA CD – COMPENDIUM OF MASSDEP DWM NASHUA RIVER TECHNICAL  
MEMORANDUMS AND REPORTS**

Nashua River Watershed 2003 Water Quality Assessment Report  
Technical Memorandum TM-81-4 Nashua River Watershed DWM Year 2003 Water Quality Monitoring  
Data - Rivers  
Technical Memorandum TM-81-5 North Nashua River 2003 Biological Assessment  
Technical Memorandum TM 81-3 Continuous Temperature Data at Three Locations on the Squannacook  
River in Nashua River Watershed, Massachusetts  
Technical Memorandum TM S-16 Baseline Lake Survey 2003 Technical Memorandum  
Technical Memorandum Nashua River Watershed 2003 Periphyton

## LIST OF ACRONYMS AND ABBREVIATIONS

7Q10	seven day, ten year low flow	MWRA	Massachusetts Water Resources Authority
BPJ	best professional judgment	NAWQA	National Water-Quality Assessment Program
CERO	Central Region Office	NERL	Northeast Regional Laboratory
CFU	colony forming unit	NERO	Northeast Region Office
CMR	Code of Massachusetts Regulations	ng	nanograms
CSO	combined sewer overflow	NPDES	National Pollutant Discharge Elimination System
CWA	Clean Water Act	NRWA	Nashua River Watershed Association
DDT	dichlorodiphenyltrichloroethane	PAH	polycyclic aromatic hydrocarbon
DMF	Division of Marine Fisheries	PCB	polychlorinated biphenyls
DO	dissolved oxygen	ppb	parts per billion
DPW	Department of Public Works	ppm	parts per million
DWM	Division of Watershed Management	PWS	public water supply
DWP	Drinking Water Program	QA/QC	quality assurance/ quality control
EPA	United States Environmental Protection Agency	QAPP	quality assurance project plan
EPT	Ephemeroptera, Plecoptera, Tricoptera	RBP	Rapid Bioassessment Protocol
L-EL	low effect level	S-EL	severe effect level
MA DCR	Massachusetts Department of Conservation and Recreation	SSO	sanitary sewer overflow
MA DFG	Massachusetts Department of Fish and Game	SU	standard units
MA DPH	Massachusetts Department of Public Health	SWQS	Surface Water Quality Standards
MassDEP	Massachusetts Department of Environmental Protection	TEQ/kg	toxic equivalents per kilogram
MassGIS	Massachusetts Geographic Information System	TMDL	total maximum daily load
ug/kg	microgram per kilogram	TOXTD	MassDEP DWM Toxicity Testing Database
mg/L	milligram per liter	USGS	United States Geological Survey
MGD	million gallons per day	WBS	Waterbody System database
ml	Milliliters.	WMA	Water Management Act
		WWTP	wastewater treatment plant

## EXECUTIVE SUMMARY

### NASHUA RIVER WATERSHED 2003 WATER QUALITY ASSESSMENT REPORT

The Massachusetts Surface Water Quality Standards (SWQS) designate the most sensitive uses for which surface waters in the state shall be protected. The assessment of current water quality conditions is a key step in the successful implementation of the Watershed Approach. This critical phase provides an assessment of whether or not the designated uses are supported or impaired, or are not assessed, as well as basic information needed to focus resource protection and remediation activities later in the watershed management planning process.

This report presents a summary of current water quality data/information in the Nashua River Watershed used to assess the status of the designated uses as defined in the SWQS. The designated uses, where applicable, include: *Aquatic Life, Fish Consumption, Drinking Water, Primary and Secondary Contact Recreation and Aesthetics*. Each use, within a given assessment segment, is individually assessed as **support** or **impaired**. When too little current data/information exists or no reliable data are available for an assessment segment the use is **not assessed**. However, if there is some indication of water quality impairment, which is not “naturally-occurring”, the use is identified with an “Alert Status”. Many river miles and lakes do not have an assigned assessment segment identification number and the status of their designated uses has never been assessed, investigated, and/or reported to the EPA in the Commonwealth’s Summary of Water Quality Report (305(b) Report) nor is information on these waters maintained in the Waterbody System (WBS) or the new Assessment Database (ADB). In the interest of reporting on all river miles and lake acres in the Nashua River Watershed, any waters not currently assigned an assessment segment identification number are classified as **not assessed other waters**.

The summary of the assessments for the *Aquatic Life, Fish Consumption, Primary and Secondary Contact Recreation, and Aesthetics* uses in the Nashua River watershed segments are illustrated in Figures 1 through 5, respectively. The percentage of total river miles and lake acreage classified as impaired, support, not assessed segments or not assessed other waters for each designated use are provided in Table 1.

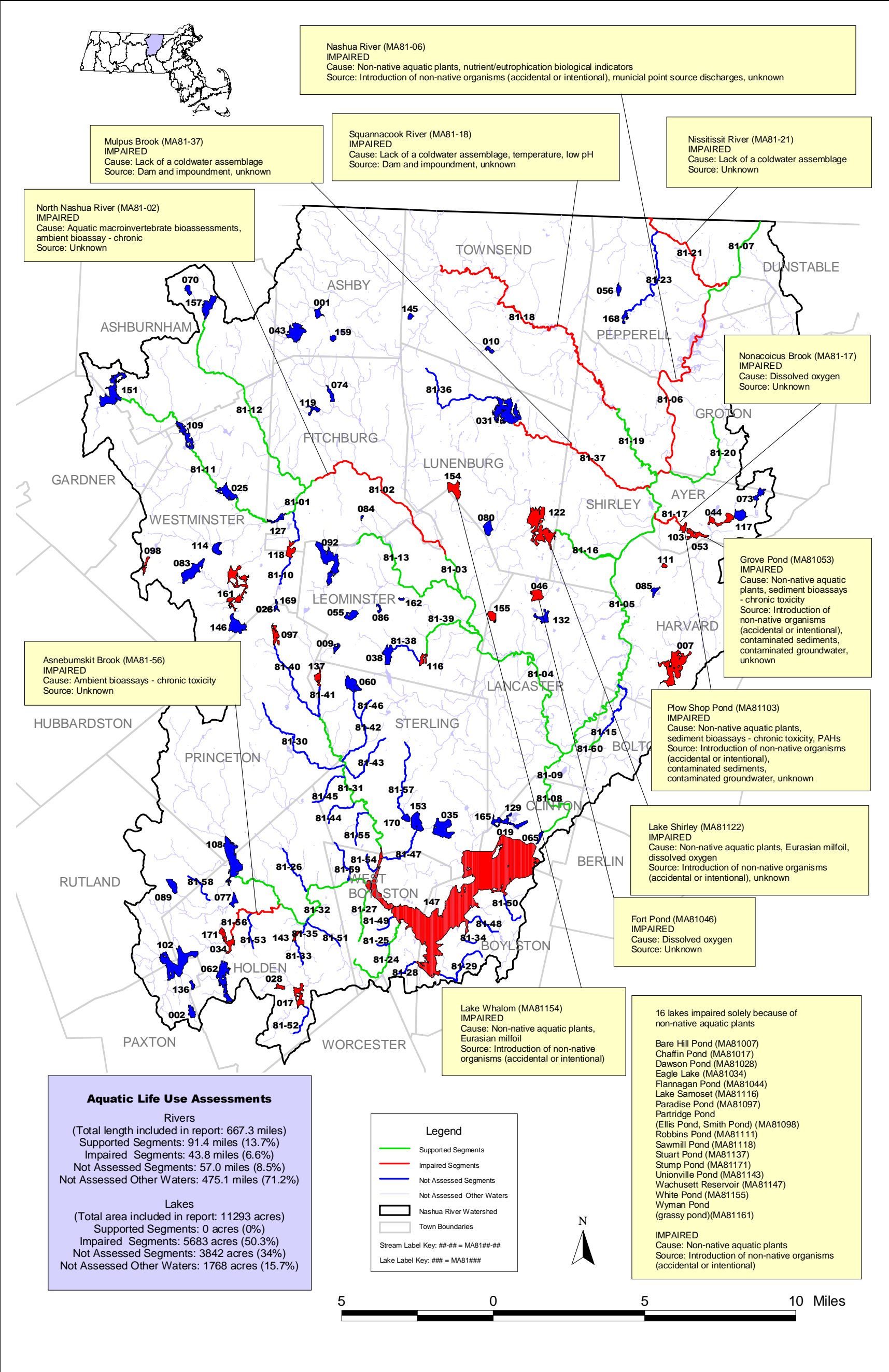
**Table 1.** Percentage of total perennial river miles (667 miles) and lake acreage (11,293 acres) in the Nashua River watershed assessed as support, impaired, or not assessed for each use. (Total river miles and lake acreage was calculated using the 2002-2005 high resolution National Hydrography Dataset (1:24,000))

	Use	Support	Impaired	Not Assessed Segments	Not Assessed Other Waters
River	Aquatic Life	13.7%	6.6%	8.5%	71.2%
	Fish Consumption	0.0%	1.4%	27.4%	71.2%
	Drinking Water	Not Assessed in this Report <sup>2</sup>			
	Primary Contact	17.2%	9.5%	2.1%	71.2%
	Secondary Contact	23.8%	4.0%	1.0%	71.2%
	Aesthetics	14.7%	2.9%	11.2%	71.2%
Lakes <sup>1</sup>	Aquatic Life	0.0%	50.3%	34.0%	15.7%
	Fish Consumption	0.0%	43.7%	40.6%	15.7%
	Drinking Water	Not Assessed in this Report <sup>2</sup>			
	Primary Contact	35.1%	0.8%	48.4%	15.7%
	Secondary Contact	35.1%	0.8%	48.4%	15.7%
	Aesthetics	35.1%	0.8%	48.4%	15.7%

1 – Wachusett Reservoir (3952 acres) constitutes 35 percent of the lake acreage in the Nashua River watershed.

2 - While this use is not assessed in this report, information on drinking water source protection and finish water quality is available at <http://www.mass.gov/dep/water/drinking.htm> and from local public water suppliers.

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**Figure 1.** *Aquatic Life Use* assessment summary for rivers, estuarine, and lake segments in the Nashua River Watershed. Note: The *Aquatic Life Use* is supported when suitable habitat (including water quality) is available for sustaining a native, naturally diverse, community of aquatic flora and fauna. Impairment of the *Aquatic Life Use* may result from anthropogenic stressors that include point and/or non-point sources of pollution and hydrologic modification. Causes and/or sources of impairments, when known, are noted in the callouts.

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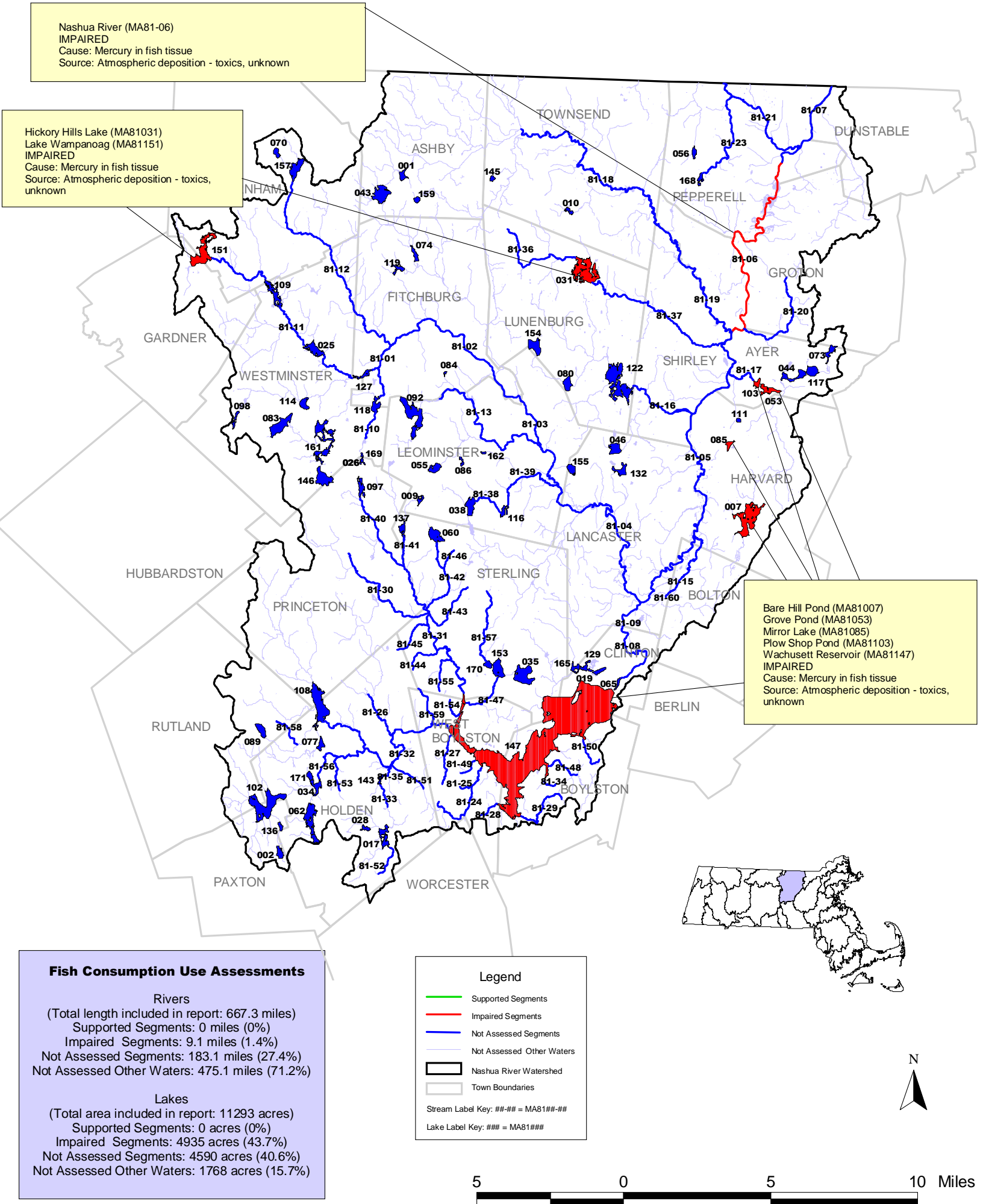
The current MA DPH statewide advisory (MA DPH 2001) is as follows.

In July 2001 MA DPH issued new consumer advisories on fish consumption and mercury contamination. The MA DPH "...is advising pregnant women, women of childbearing age who may become pregnant, nursing mothers, and children under 12 years of age to refrain from eating the following marine fish; shark, swordfish, king mackerel, tuna steak and tilefish. In addition, MA DPH is expanding its previously issued statewide fish consumption advisory which cautioned pregnant women to avoid eating fish from all freshwater bodies due to concerns about mercury contamination, to now include women of childbearing age who may become pregnant, nursing mothers and children under 12 years of age. Finally, MA DPH is recommending that pregnant women, women of childbearing age who may become pregnant, nursing mothers, and children under 12 years of age limit their consumption of fish not covered by existing advisories to no more than 12 ounces (or about 2 meals) of cooked or uncooked fish per week. This recommendation includes canned tuna, the consumption of which should be limited to two (2) cans per week. Very small children, including toddlers, should eat less. Consumers may wish to choose to eat light tuna rather than white or chunk white tuna, the latter of which may have higher levels of mercury."

MA DPH's statewide advisory does not include fish stocked by the state Division of Fisheries and Wildlife or farm-raised fish sold commercially.

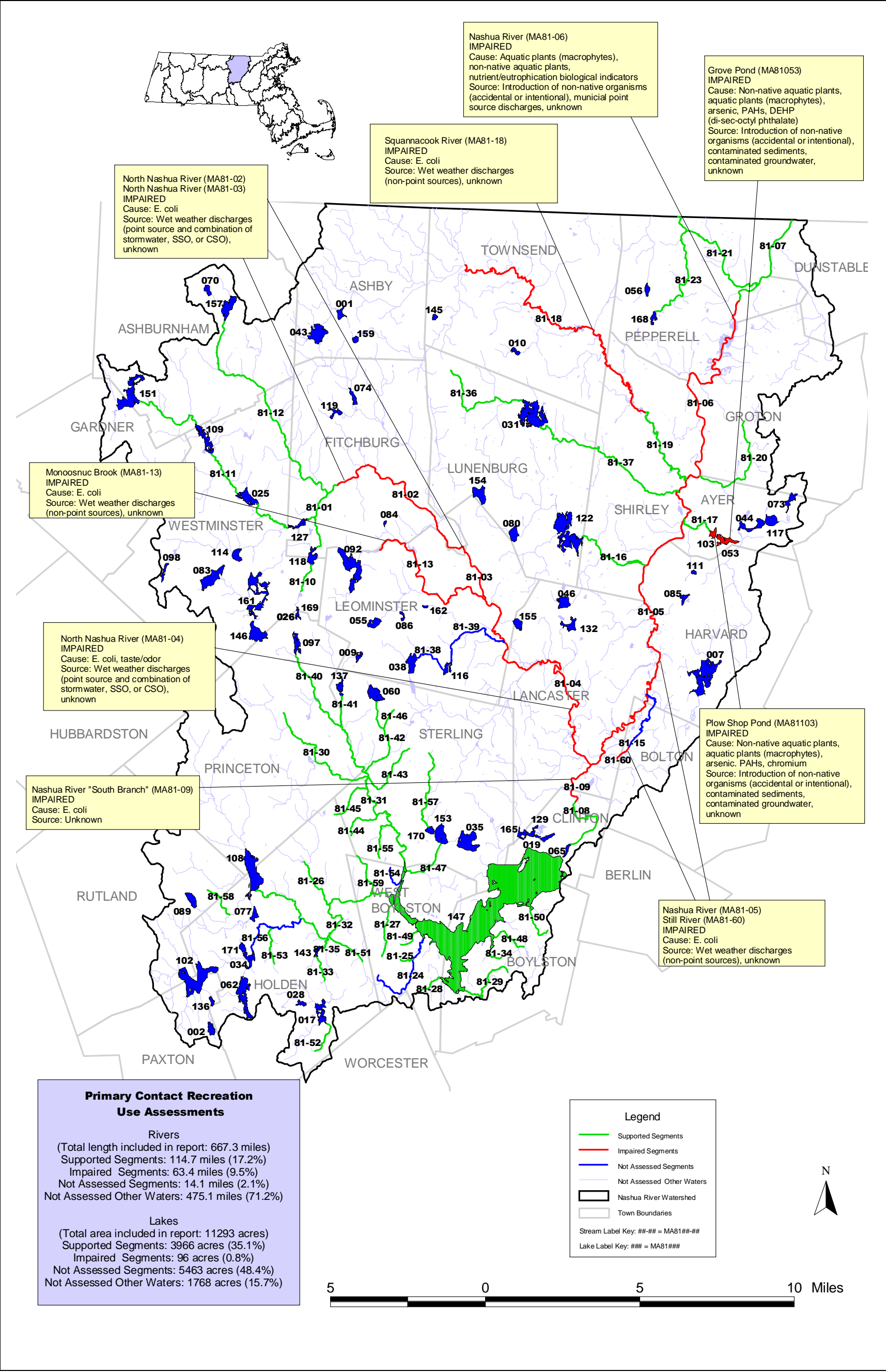
Since the statewide advisory encompasses all freshwaters in Massachusetts, the Fish Consumption Use for waterbodies cannot be assessed as support.

Northeast Regional Mercury TMDL - On 20 December 2007 the U.S. EPA approved the Northeast Regional Mercury Total Maximum Daily Load (TMDL). This TMDL is a Federal Clean Water Act mandated document that identifies pollutant load reductions necessary for regional waterbodies to meet and maintain compliance with state and federal water quality standards. It was prepared by the New England Interstate Water Pollution Control Commission (NEIWPCC) in cooperation with the states of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. The TMDL covers inland waterbodies that are impaired primarily due to atmospheric deposition of mercury (Northeast States 2007). The TMDL target for Massachusetts is 0.3 ppm or less of mercury in fish tissue. The plan calls for a 75% reduction of in-region and out of region atmospheric sources by 2010 and a 90% or greater reduction in the future (NEIWPCC 2007). The TMDL will be reassessed in 2010 based on an evaluation of new on-going monitoring and air deposition data. Final targets will be determined at that time.



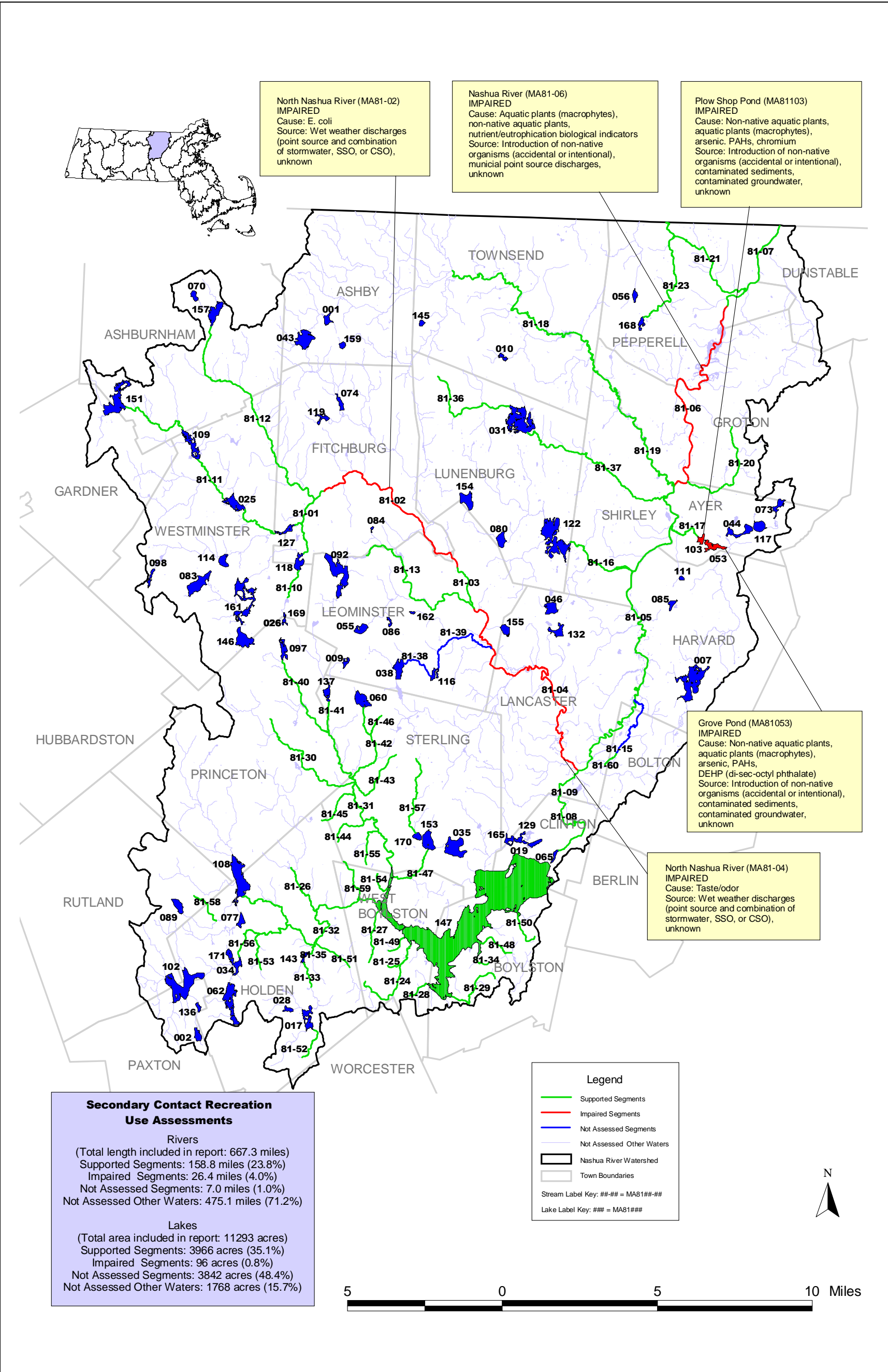
**Figure 2.** *Fish Consumption Use* assessment summary for rivers, estuarine, and lake segments in the Nashua River Watershed.  
Note: The *Fish Consumption Use* is supported when there are no unacceptable concentrations of pollutants in edible portions of fish, other aquatic life or wildlife for human consumption. The assessment of the *Fish Consumption Use* is made using the most recent list of Fish Consumption Advisories issued by the Massachusetts Executive Office of Health and Human Services, Department of Public Health (MA DPH). The MA DPH list identifies waterbodies where elevated levels of a specified contaminant in edible portions of freshwater species pose a health risk for human consumption; hence, the Fish Consumption Use is assessed as impaired in these waters. In July 2001 MA DPH issued new consumer advisories on fish consumption and mercury contamination. Because of these statewide advisories no waters can be assessed as support for the Fish Consumption Use. These waters default to “not assessed”.

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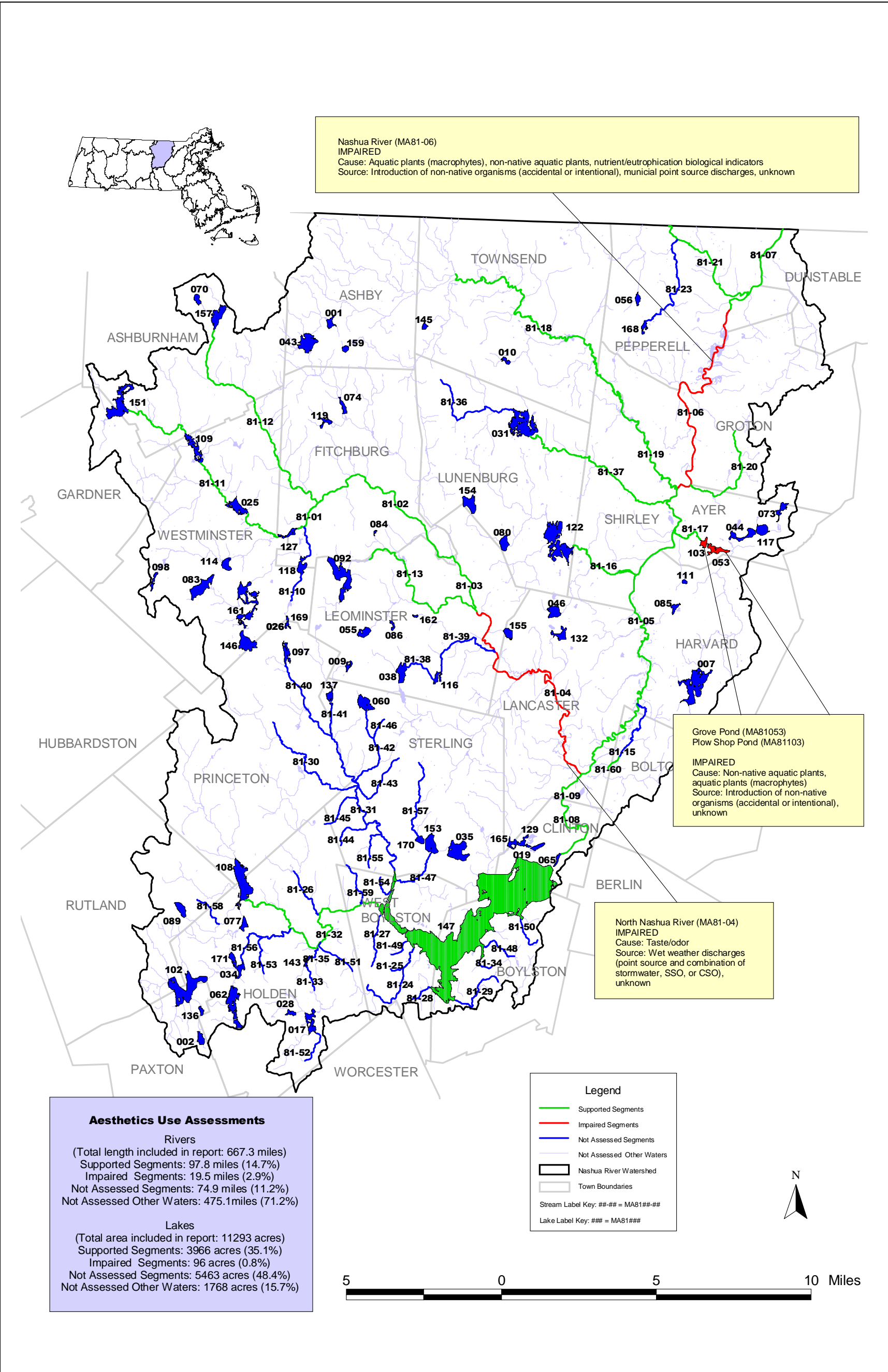
**Figure 3.** *Primary Contact Recreational Use* assessment summary for rivers, estuarine, and lake segments in the Nashua River Watershed. Note: The *Primary Contact Recreational Use* is supported when conditions are suitable (fecal coliform bacteria densities, turbidity and aesthetics meet the SWQS and/or the MA DPH Bathing Beaches State Sanitary Code and/or guidance) for any recreational or other water related activity during which there is prolonged and intimate contact with the water and there exists a significant risk of ingestion. Activities include, but are not limited to, wading, swimming, diving, surfing and water skiing. Causes and/or sources of impairments, when known, are noted in the callouts.

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**Figure 4.** Secondary Contact Recreational Use assessment summary for rivers, estuarine, and lake segments in the Nashua River Watershed. Note: The Secondary Contact Recreational Use is supported when conditions are suitable for any recreational or other water use during which contact with the water is either incidental or accidental. These include, but are not limited to, fishing, boating and limited contact related to shoreline activities. For lakes, non-native aquatic macrophyte cover and/or transparency data (Secchi disk depth) are evaluated to assess the status of the recreational uses. Causes and/or sources of impairments, when known, are noted in the callouts.

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**Figure 5.** *Aesthetics Use* assessment summary for rivers, estuarine, and lake segments in the Nashua River Watershed. Note: The *Aesthetics Use* is supported when surface waters are free from pollutants in concentrations or combinations that settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life. Causes and/or sources of impairments, when known, are noted in the callouts.

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## INTRODUCTION

The goal of the Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters (Environmental Law Reporter 1988). To meet this objective, the CWA requires states to develop information on the quality of the Nation's water resources and report this information to the U.S. Environmental Protection Agency (EPA), the U.S. Congress, and the public. Together, these agencies are responsible for implementation of the CWA mandates. Under Section 305(b) of the Federal Clean Water Act, every two years, the Massachusetts Department of Environmental Protection (MassDEP) must submit to EPA a statewide report that describes the status of water quality in the Commonwealth. Until 2002 this was accomplished as a statewide summary of water quality (the 305(b) Report). States are also required to submit, under Section 303(d) of the CWA, a list of impaired waters requiring a total maximum daily load (TMDL) calculation. In 2002, however, EPA gave states the option to combine elements of the statewide 305(b) Report and the Section 303(d) List of Impaired Waters into one "Integrated List of Waters" (Integrated List). This statewide list is based on the compilation of information for the Commonwealth's 27 watersheds. Massachusetts has opted to write individual watershed surface water quality assessment reports and use them as the supporting documentation for the Integrated List. The assessment reports utilize data compiled from a variety of sources and provide an evaluation of water quality, progress made towards maintaining and restoring water quality, and the extent to which problems remain at the watershed level. Quality-assured in-stream biological, habitat, physical/chemical, toxicity data and other information are evaluated to assess the status of water quality conditions. This analysis follows a standardized process described in the Assessment Methodology Section.

This report presents the current assessment of water quality conditions in the Nashua River watershed. The assessments are based on information that has been researched and developed by the MassDEP through the first three years (information gathering, monitoring, and assessment) of the five-year basin cycle in partial fulfillment of MassDEP's federal mandate to report on the status of the Commonwealth's waters under the CWA. Specifically, water quality monitoring data collected by the MassDEP, Division of Watershed Management (DWM) staff in 2003 were utilized to make assessment decisions. All data collected by MassDEP DWM in 2003 are available on the attached data CD in the form of technical memorandums. Water quality data from other sources (see Acknowledgements) used to make use assessment decisions are available from those agencies and organizations.

## MASSACHUSETTS INTEGRATED LIST OF WATERS

Section 305(b) of the CWA defines the process whereby states monitor and assess the quality of their surface and groundwater and report on the status of those waters every two years. Section 303(d) of the CWA requires states to periodically identify and list those waterbodies for which existing controls on point and nonpoint sources of pollutants are not stringent enough to attain or maintain compliance with applicable surface water quality standards. Through the year 2000 the MassDEP fulfilled the 305(b) and 303(d) reporting requirements in two completely separate documents. In 2001 the EPA released guidance that provided states with the option of preparing a single Integrated List of Waters to be submitted that would meet the reporting requirements of both sections 305(b) and 303(d) of the CWA.

The EPA approved the Massachusetts Year 2006 Integrated List of Waters in September 2007. In that report each waterbody segment was placed in one of five major categories. Category 1 included those waters that were meeting all designated uses. No Massachusetts waters were listed in Category 1 because a statewide health advisory pertaining to the consumption of fish precludes any waters from being in full support of the fish consumption use. Waters listed in Category 2 were found to support some of the uses for which they were assessed but other uses were unassessed. Category 3 contained those waters for which insufficient or no information was available to assess any uses.

Waters exhibiting impairment for one or more uses were placed in either Category 4 (impaired but not requiring a TMDL report) or Category 5 (impaired and requiring one or more TMDLs) according to the EPA guidance. Category 4 was further divided into three sub-categories – 4A, 4B and 4C – depending

upon the reason that TMDLs were not needed. Category 4A included waters for which the required TMDL(s) had already been completed and approved by the EPA. However, since segments could only appear in one-category waters that had an approved TMDL for some pollutants, but not others, remained in Category 5. Category 4B was to include waters for which other pollution control requirements were reasonably expected to result in the attainment of the designated use before the next listing cycle (i.e., 2006). Because of the uncertainty related to making predictions about conditions in the future the MassDEP made a decision not to utilize Category 4B in the 2006 Integrated List. Finally, waters impaired by factors, such as flow modification or habitat alteration, that are not subjected to TMDL calculations because the impairment is not related to one or more pollutants were included in Category 4C. See individual segment assessments for information pertaining to the 2006 Integrated List category and causes of impairment.

## **NASHUA RIVER WATERSHED DESCRIPTION**

The Nashua River is a tributary of the Merrimack River, one of several New England rivers draining to the Atlantic Ocean. The Nashua River's 530 square-mile total drainage area lies primarily within Worcester and Middlesex counties in Massachusetts, and a small area of Hillsborough County, New Hampshire. The Nashua River watershed is located in north central Massachusetts and southern New Hampshire. Although the Nashua River flows northeast to the Merrimack River, its major tributaries flow in a southeast direction. The area drained by the major tributaries lies to the west of the Nashua River.

In Massachusetts, the Nashua River watershed is bordered by the Millers River and Chicopee River watersheds on the west, the Blackstone River watershed on the south, and the Merrimack River and Concord River watershed on the east. The communities of Ashburnham, Ashby, Ayer, Bolton, Boylston, Clinton, Dunstable, Fitchburg, Gardner, Groton, Harvard, Holden, Lancaster, Leominster, Lunenburg, Paxton, Pepperell, Princeton, Rutland, Shirley, Sterling, Townsend, West Boylston, and Westminster lie wholly or in part within the basin boundaries in Massachusetts. The Nashua River Basin has a land-use pattern typical of rural areas in Massachusetts and New Hampshire; concentrated settlements and strip development with much of the basin underdeveloped and containing large areas of privately-owned open spaces (Kimball 1998). Paper production has been the prominent industry in Fitchburg and Leominster in the Nashua River Basin since the early 19<sup>th</sup> century. Although these cities continue to be the population and economic centers, the industrial community now includes plastics, fabricated metal products, machinery, and chemical manufacturing.

The Nashua River begins at the outlet of Lancaster Millpond in Clinton and flows in a northerly direction to its confluence with the North Nashua River in Lancaster. This portion of the river is commonly referred to as the "South Branch" Nashua River. The North Nashua River, from its headwaters in Fitchburg at the confluence of the Whitman River and Flag Brook, flows in a southeasterly direction for a distance of approximately 19 miles. The North Nashua River has an elevation drop of 360 feet. Downstream from the confluence with the North Nashua River, the mainstem falls another 110 feet along its remaining 37-mile northeasterly course to its confluence with the Merrimack River in Nashua, New Hampshire. Two major tributaries, the Squannacook and Nissitissit rivers, join the mainstem Nashua River in Massachusetts. This report only covers portion of the Nashua River Watershed within Massachusetts. There are approximately 667 river miles in the Massachusetts portion of the Nashua River Watershed.

## **OBJECTIVES**

This report is an update to the last water quality assessment report for the Nashua River watershed that was published by DWM in January 2001. The methodology used to assess the status of water quality conditions of rivers and lakes in accordance with EPA's and MassDEP's use assessment methods is provided in Appendix A. Data collected by DWM in 2003 are available on the Data Source CD.

The objectives of this water quality assessment report are to:

1. evaluate whether or not surface waters in the Nashua River Watershed, defined as segments in the MassDEP/EPA databases, currently support their designated uses and

2. identify the stressors impairing designated uses and any confirmed sources of those stressors.

### ASSESSMENT REPORT FORMAT

In this report the assessment information for waters that are assessed for any one or more designated use(s) is summarized in a table format. The tables summarize the assessment decisions for the *Aquatic Life*, *Fish Consumption*, *Primary* and *Secondary Contact Recreation* and *Aesthetics* uses, the data that informed those decisions, the cause(s) of any impairments, and the confirmed source(s) for the impairment (Table 2).

**Table 2.** An example table format used to present assessment information in the 2003 Nashua River Watershed Assessment Report.

#### **Example Brook (Segment MA81-99)**

Location: Fake Pond, Groton, to confluence with Cat Brook, Shirley.

Segment Length: 4.4 Miles

Classification: Class B

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown, Nutrients-Pathogens

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Support</b>	<b>Yes</b>
MassDEP DWM measured dissolved oxygen, temperature, and pH six times at one site in 2003 and found no violations of the temperature or pH criterion and five violations of the dissolved oxygen criterion. The DO violations ranged from 2.9 mg/L to 3.6 mg/L. <b>Cause(s) of Impairment:</b> Dissolved oxygen <b>Source(s) of Impairment:</b> Unknown <i>Data Sources: 24</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH apply to this waterbody.		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 102 CFU/100ml. This result does not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 24</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 102 CFU/100ml. This result does not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 24</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae. <i>Data Sources: 24</i>		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

The *Drinking Water* use is not assessed in this report. MassDEP's Drinking Water Program (DWP) has primacy for implementing the provisions of the federal Safe Drinking Water Act (SDWA) and maintains current drinking supply monitoring data. More information is available on the MassDEP website at <http://www.mass.gov/dep/water/drinking.htm>.

The table is divided into five sections (i.e., one section for each use) and the "Designated Use" column in the table indicates which use is being summarized in that section. The "Use Assessment" column states the assessment decision (support, impaired, not assessed) for the use. The "Alert" column is used when an issue was identified that is of concern (i.e., an "Alert Status" was noted for the use but the use was not assessed as impaired). In the space below each use in the table is a summary of the data that directed or influenced the assessment decision and their sources. The numbers identified as the data sources correspond to the numbered citations in the Data Sources section. The "Cause(s) of Impairment" and "Source(s) of Impairment" identify the stressors leading to the impairment decision and the any confirmed source(s) of the stressor(s). The causes and sources come from the list in the EPA Assessment Database Version 2 (ADB).

## **ASSESSMENT METHODOLOGY**

### **Guidelines for Evaluating Designated Use Status of Massachusetts Surface Waters - 2007**

The Clean Water Act (CWA) Section 305(b) water quality reporting process is an essential aspect of the Nation's water pollution control effort. It is the principal means by which EPA, Congress, and the public evaluate existing water quality, assess progress made in maintaining and restoring water quality, and determine the extent of remaining problems. By this process states report on waterbodies within the context of meeting their designated uses. These uses include: *Aquatic Life, Fish Consumption, Drinking Water, Primary Contact Recreation, Secondary Contact Recreation, Shellfish Harvesting and Aesthetics*. Two subclasses of Aquatic Life are also designated in the Massachusetts Surface Water Quality Standards (SWQS): Cold Water Fishery – waters capable of sustaining a year-round population of cold water aquatic life, such as trout – and Warm Water Fishery – waters that are not capable of sustaining a year-round population of cold water aquatic life (MassDEP 2006).

The SWQS, summarized in Table 3, prescribe minimum water quality criteria to sustain the designated uses. Furthermore, these standards describe the hydrological conditions at which water quality criteria must be applied (MassDEP 2006). In rivers the lowest flow conditions at and above which aquatic life criteria must be applied are the lowest mean flow for seven consecutive days to be expected once in ten years (7Q10). In waters where flows are regulated by dams or similar structures, the lowest flow conditions at which aquatic life criteria must be applied are the flows equal to or exceeded 99% of the time on a yearly basis or another equivalent flow that has been agreed upon (see MassDEP 2006 for more detail). In coastal and marine waters and for lakes, the Massachusetts Department of Environmental Protection (MassDEP) will determine on a case-by-case basis the most severe hydrological condition for which the aquatic life criteria must be applied.

The availability of appropriate and reliable scientific data and technical information is fundamental to the 305(b) reporting process. It is EPA policy (EPA Order 5360.1 CHG 1) that any individual or group performing work for or on behalf of EPA establishes a quality system to support the development, review, approval, implementation, and assessment of data collection operations. To this end MassDEP describes its Quality System in an EPA-approved Quality Management Plan to ensure that environmental data collected or compiled by the MassDEP are of known and documented quality and are suitable for their intended use. For external sources of information, MassDEP requires the following: 1) an appropriate Quality Assurance Project Plan (QAPP), including a laboratory Quality Assurance /Quality Control (QA/QC) plan; 2) use of a state certified lab (or as otherwise approved by MassDEP for a particular analysis); and 3) sample data, QA/QC and other pertinent sample handling information documented in a citable report. This information will be reviewed by MassDEP to determine its validity and usability to assess water use support. Data use could be modified or rejected due to poor or undocumented QAPP implementation, lack of project documentation, incomplete reporting of data or information, and/or project monitoring objectives unsuitable for MassDEP assessment purposes.

EPA provides guidelines to states for making their use support determinations (EPA 1997 and 2002, Grubbs and Wayland III 2000 and Wayland III 2001). The determination of whether or not a waterbody supports each of its designated uses is a function of the type(s), quality and quantity of available current information. Although data/information older than five years are usually considered “historical” and used for descriptive purposes they can be utilized in the use support determination provided they are known to reflect the current conditions. While the water quality standards (Table 3) prescribe minimum water quality criteria to sustain the designated uses, numerical criteria are not available for every indicator of pollution. Best available guidance from available literature may be applied in lieu of actual numerical criteria (e.g., freshwater sediment data may be compared to *Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario* 1993 by D. Persaud, R. Jaagumagi and A. Hayton). Excursions from criteria due solely to “naturally occurring” conditions (e.g., low pH in some areas) do not constitute violations of the SWQS.

Each designated use within a given segment is individually assessed as **support** or **impaired**. When too little current data/information exist or no reliable data are available, the use is **not assessed**. In this report, however, if there is some indication that water quality impairment may exist, and it is not “naturally occurring”, the use is identified with an “Alert Status”. It is important to note that not all waters are assessed. Many small and/or unnamed ponds, rivers, and estuaries have never been assessed; the status of their designated uses has never been reported to EPA in the Commonwealth’s 305(b) Report or the Integrated List of Waters nor is information on these waters maintained in the waterbody system database (WBS) or the new assessment database (ADB). These waterbodies are classified as **not assessed other waters**.

### Waterbody Classes

The Massachusetts Surface Water Quality Standards designate classes for the surface waters of the Commonwealth. Each of these classes is described below (MassDEP 2006).

- **CLASS A** - These waters include waters designated as a source of public water supply and their tributaries. They are designated as excellent habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation, even if not allowed. These waters shall have excellent aesthetic value. These waters are protected as Outstanding Resource Waters.
- **CLASS B** - These waters are designated as a habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. Where designated in 314 CMR 4.06, they shall be suitable as a source of public water supply with appropriate treatment (“Treated Water Supply”). Class B waters shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value.
- **CLASS C** - These waters are designated as a habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for secondary contact recreation. These waters shall be suitable for the irrigation of crops used for consumption after cooking and for compatible industrial cooling and process uses. These waters shall have good aesthetic value.
- **CLASS SA** - These waters are designated as an excellent habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. In certain waters, excellent habitat for fish, other aquatic life and wildlife may include, but is not limited to, sea grass. Where designated in the tables to 314 CMR 4.00 for shellfishing, these waters shall be suitable for shellfish harvesting without depuration (Approved and Conditionally Approved Shellfish Areas). These waters shall have excellent aesthetic value.
- **CLASS SB** - These waters are designated as a habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. In certain waters, habitat for fish, other aquatic life and wildlife may include, but is not limited to, seagrass. Where designated in the tables to 314 CMR 4.00 for shellfishing, these waters shall be suitable for shellfish harvesting with depuration (Restricted and Conditionally Restricted Shellfish Areas). These waters shall have consistently good aesthetic value.

- **CLASS SC** - These waters are designated as a habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for secondary contact recreation. They shall also be suitable for certain industrial cooling and process uses. These waters shall have good aesthetic value.

**Table 3.** Summary of Massachusetts Surface Water Quality Standards.  
(MassDEP 2006, MA DPH 2002, FDA 2003)

Dissolved Oxygen	<p><u>Class A and Class B Cold Water Fishery (BCWF) and Class SA:</u> <math>\geq 6.0</math> mg/L</p> <p><u>Class A and Class B Warm Water Fishery (BWFF) and Class SB:</u> <math>\geq 5.0</math> mg/L</p> <p><u>Class C:</u> Not <math>&lt; 5.0</math> mg/L at least 16 hours of any 24-hour period and not <math>&lt; 3.0</math> mg/L at any time.</p> <p><u>Class SC:</u> Not <math>&lt; 5.0</math> mg/L at least 16 hours of any 24-hour period and not <math>&lt; 4.0</math> mg/L anytime.</p> <p>For all classes, where natural background conditions are lower than the criteria stated for each class, DO shall not be less than natural background conditions. Natural seasonal and daily variations that are necessary to protect existing and designated uses shall also be maintained.</p>
Temperature	<p><u>Class A CWF:</u> <math>\leq 68^{\circ}\text{F}</math> (<math>20^{\circ}\text{C}</math>) based on the mean of the daily maximum temperature over a seven day period in cold water fisheries, unless naturally occurring and <math>\Delta T</math> due to a discharge <math>\leq 1.5^{\circ}\text{F}</math> (<math>0.8^{\circ}\text{C}</math>).</p> <p><u>Class A WWF:</u> <math>\leq 83^{\circ}\text{F}</math> (<math>28.3^{\circ}\text{C}</math>) and <math>\Delta T</math> due to a discharge <math>\leq 1.5^{\circ}\text{F}</math> (<math>0.8^{\circ}\text{C}</math>).</p> <p><u>Class BCWF:</u> <math>\leq 68^{\circ}\text{F}</math> (<math>20^{\circ}\text{C}</math>) based on the mean of the daily maximum temperature over a seven day period in all cold water fisheries, unless naturally occurring, and <math>\Delta T</math> due to a discharge <math>\leq 3^{\circ}\text{F}</math> (<math>1.7^{\circ}\text{C}</math>)</p> <p><u>Class BWFF:</u> <math>\leq 83^{\circ}\text{F}</math> (<math>28.3^{\circ}\text{C}</math>) and <math>\Delta T</math> due to a discharge <math>\leq 5^{\circ}\text{F}</math> (<math>2.8^{\circ}\text{C}</math>) in rivers (based on the minimum expected flow for the month) and <math>\Delta T</math> due to a discharge <math>\leq 3^{\circ}\text{F}</math> (<math>1.7^{\circ}\text{C}</math>) in the epilimnion (based on the monthly average of maximum daily temperatures) in lakes,</p> <p><u>Class C and Class SC:</u> <math>\leq 85^{\circ}\text{F}</math> (<math>29.4^{\circ}\text{C}</math>) and <math>\Delta T</math> due to a discharge <math>\leq 5^{\circ}\text{F}</math> (<math>2.8^{\circ}\text{C}</math>)</p> <p><u>Class SA:</u> <math>\leq 85^{\circ}\text{F}</math> (<math>29.4^{\circ}\text{C}</math>) nor a maximum daily mean of <math>80^{\circ}\text{F}</math> (<math>26.7^{\circ}\text{C}</math>) and <math>\Delta T</math> due to a discharge <math>\leq 1.5^{\circ}\text{F}</math> (<math>0.8^{\circ}\text{C}</math>)</p> <p><u>Class SB:</u> <math>\leq 85^{\circ}\text{F}</math> (<math>29.4^{\circ}\text{C}</math>) nor a maximum daily mean of <math>80^{\circ}\text{F}</math> (<math>26.7^{\circ}\text{C}</math>) and <math>\Delta T</math> due to a discharge <math>\leq 1.5^{\circ}\text{F}</math> (<math>0.8^{\circ}\text{C}</math>) between July and September and <math>\leq 4.0^{\circ}\text{F}</math> (<math>2.2^{\circ}\text{C}</math>) between October and June.</p> <p><i>For all classes, natural seasonal and daily variations that are necessary to protect existing and designated uses shall be maintained. There shall be no changes from natural background conditions that would impair any uses assigned to each class, including those conditions necessary to protect normal species diversity, successful migration, reproductive functions or growth of aquatic organisms.</i></p> <p>For CWF waters, where a reproducing cold-water aquatic community exists at a naturally higher temperature, the temperature necessary to protect the community shall not be exceeded and natural daily and seasonal temperature fluctuations necessary to protect the community shall be maintained.</p> <p><u>Class B, C, SA, SB, and SC:</u> See MassDEP 2006 for language specific to alternative effluent limitations relating to thermal discharges and cooling water intake structures.</p>
pH	<p><u>Class A, Class BCWF and Class BWFF:</u> 6.5 - 8.3 SU and <math>\Delta 0.5</math> outside the natural background range.</p> <p><u>Class C:</u> 6.5 - 9.0 SU and <math>\Delta 1.0</math> outside the natural background range.</p> <p><u>Class SA and Class SB:</u> 6.5 - 8.5 SU and <math>\Delta 0.2</math> SU outside the natural background range.</p> <p><u>Class SC:</u> 6.5 - 9.0 SU and <math>\Delta 0.5</math> SU outside the natural background range.</p> <p>There shall be no change from natural background conditions that would impair any use assigned to each class.</p>
Solids	<p><u>All Classes:</u> These waters shall be free from floating, suspended, and settleable solids in concentrations or combinations that would impair any use assigned to each class, that would cause aesthetically objectionable conditions, or that would impair the benthic biota or degrade the chemical composition of the bottom.</p>
Color and	<p><u>All Classes:</u> These waters shall be free from color and turbidity in concentrations or</p>

**Table 3.** Summary of Massachusetts Surface Water Quality Standards.  
(MassDEP 2006, MA DPH 2002, FDA 2003)

Turbidity	<i>combinations that are aesthetically objectionable or would impair any use.</i>
Oil and Grease	<p><u>Class A and Class SA:</u> Waters shall be free from oil and grease, petrochemicals and other volatile or synthetic organic pollutants.</p> <p><u>Class SA:</u> Waters shall be free from oil and grease and petrochemicals.</p> <p><u>Class B, Class C, Class SB and Class SC:</u> Waters shall be free from oil, grease, and petrochemicals that produce a visible film on the surface of the water, impart an oily taste to the water or an oily or other undesirable taste to the edible portions of aquatic life, coat the banks or bottom of the water course, or are deleterious or become toxic to aquatic life.</p>
Taste and Odor	<p><u>Class A and Class SA:</u> None other than of natural origin.</p> <p><u>Class B, Class C, Class SB and Class SC:</u> None in such concentrations or combinations that are aesthetically objectionable, that would impair any use assigned to each class, or that would cause tainting or undesirable flavors in the edible portions of aquatic life.</p>
Aesthetics	<u>All Classes:</u> All surface waters shall be free from pollutants in concentrations or combinations that settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life.
Toxic Pollutants	<u>All Classes:</u> All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife. For pollutants not otherwise listed in 314 CMR 4.00, the National Recommended Water Quality Criteria: 2002, EPA 822-R-02-047, November 2002 published by EPA pursuant to Section 304(a) of the Federal Water Pollution Control Act, are the allowable receiving water concentrations for the affected waters, unless the Department either establishes a site specific criterion or determines that naturally occurring background concentrations are higher. The Department shall use the water quality criteria for the protection of aquatic life expressed in terms of the dissolved fraction of metals when EPA's 304(a) recommended criteria provide for use of the dissolved fraction (see Mass DEP 2006 for more detail regarding permit limits, conversion factors, site specific criteria).
Nutrients	<i>Unless naturally occurring, all surface waters shall be free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses and shall not exceed the site specific criteria developed in a TMDL or as otherwise established by the Department pursuant to these Standards.</i>
<p>Bacteria (MassDEP 2006 and MA DPH 2002)</p> <p>Class A criteria apply to the <i>Drinking Water Use.</i></p> <p>Class B and SB criteria apply to <i>Primary Contact Recreation Use</i> while Class C and SC criteria apply to <i>Secondary Contact Recreation Use.</i></p>	<p><u>Class A:</u> At water supply intakes in unfiltered public water supplies: either fecal coliform shall not exceed 20 organisms/100 ml in all samples taken in any six month period, or total coliform shall not exceed 100 organisms/ 100 ml in 90% of the samples taken in any six month period. If both total and fecal coliform are measured, then only the fecal coliform criterion must be met.</p> <p><u>Class A other waters, Class B:</u> Where <i>E. coli</i> is the chosen indicator at public bathing beaches as defined by MA DPH: The geometric mean of the five most recent <i>E. coli</i> samples taken within during the same bathing season shall not exceed 126 colonies/ 100 ml and no single sample taken during the bathing season shall exceed 235 colonies/ 100 ml (these criteria may be applied on a seasonal basis at the Department's discretion). Where Enterococci are the chosen indicators at public bathing beaches: The geometric mean of the five most recent samples taken during the same bathing season shall not exceed 33 colonies /100 ml and no single <i>Enterococci</i> sample taken during the bathing season shall exceed 61 colonies /100 ml.</p> <p>For other waters and, during the non bathing season, for waters at public bathing beaches: The geometric mean of all <i>E. coli</i> samples taken within the most recent six months shall not exceed 126 colonies/ 100 ml typically based on a minimum of five samples and no single sample shall exceed 235 colonies/ 100 ml. These criteria may be applied on a seasonal basis at the Department's discretion.</p> <p>The geometric mean of all <i>Enterococci</i> samples taken within the most recent six months shall not exceed 33 colonies/ 100 ml typically based on a minimum of five samples and no single sample shall exceed 61 colonies/ 100 ml. These criteria may be applied on a seasonal basis at the Department's discretion.</p>

**Table 3.** Summary of Massachusetts Surface Water Quality Standards.  
(MassDEP 2006, MA DPH 2002, FDA 2003)

	<p><u>Class C:</u>  <i>The geometric mean of all E. coli samples taken within the most recent six months shall not exceed 630 E. coli/ 100 ml, typically based on a minimum of five samples and 10% of such samples shall not exceed 1260 E. coli/ 100 ml. This criterion may be applied on a seasonal basis at the discretion of the Department.</i></p> <p><u>Class SA:</u>  Waters designated for shellfishing:  <i>Fecal coliform bacteria shall not exceed a geometric mean (Most Probable Number (MPN) method) of 14 organisms/100 ml, nor shall more than 10% of the samples exceed an MPN of 28 organisms/100 ml, or other values of equivalent protection based on sampling and analytical methods used by the Massachusetts Division of Marine Fisheries and approved by the National Shellfish Sanitation Program in the latest revision of the Guide for the Control of Molluscan Shellfish Areas (more stringent regulations may apply, see 314 CMR 4.06(1)(d)(5)).</i></p> <p><u>Class SB:</u>  Waters designated for shellfishing:  <i>Fecal coliform median or geometric mean MPN shall not exceed 88 organisms/100 ml, nor shall more than 10% of the samples exceed an MPN of 260 organisms/100 ml or other values of equivalent protection based on sampling and analytical methods used by the Massachusetts Division of Marine Fisheries and approved by the National Shellfish Sanitation Program in the latest revision of the Guide for the Control of Molluscan Shellfish Areas (more stringent regulations may apply, see 314 CMR 4.06(1)(d)(5)).</i></p> <p><u>Class SA and Class SB:</u>  At public bathing beaches, as defined by MA DPH:  No single <i>Enterococci</i> sample taken during the bathing season shall exceed 104 colonies /100 ml and the geometric mean of the five most recent <i>Enterococci</i> samples taken within the same bathing season shall not exceed 35 colonies /100 ml.  At public bathing beaches during the non-bathing season and in non bathing beach waters:  No single <i>Enterococci</i> sample shall exceed 104 colonies/ 100 ml and the geometric mean of all samples taken within the most recent six months, typically a minimum of five samples, shall not exceed 35 colonies/ 100 ml. These criteria may be applied on a seasonal basis at the discretion of the Department).</p> <p><u>Class SC:</u>  <i>The geometric mean of all Enterococci samples taken within the most recent six months shall not exceed 175 colonies/ 100 ml, typically based on the five most recent samples, and 10% of such samples shall not exceed 350 colonies/ 100 ml. This criterion may be applied on a seasonal basis at the discretion of the Department.</i></p>
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*Note: Italics are direct quotations.*

Δ criterion (referring to a change from natural background conditions) is applied to the effects of a permitted discharge.

## Designated Uses

The Massachusetts Surface Water Quality Standards designate the most sensitive uses for which the surface waters of the Commonwealth shall be enhanced, maintained and protected. Each of these uses is briefly described below (MassDEP 2006).

- *AQUATIC LIFE* - suitable habitat for sustaining a native, naturally diverse, community of aquatic flora and fauna, including, but not limited to, wildlife and threatened and endangered species and for their reproduction, migration, growth and other critical functions. Two subclasses of aquatic life are also designated in the standards for freshwater bodies: *Cold Water Fishery* - capable of sustaining a year-round population of cold water aquatic life, such as trout; *Warm Water Fishery* - waters that are not capable of sustaining a year-round population of cold water aquatic life. In certain waters, excellent habitat for fish, other aquatic life and wildlife may include, but is not limited to, seagrass.
- *FISH CONSUMPTION* - pollutants shall not result in unacceptable concentrations in edible portions of marketable fish or for the recreational use of fish, other aquatic life or wildlife for human consumption.
- *DRINKING WATER* - used to denote those waters used as a source of public drinking water. They may be subject to more stringent regulation in accordance with the Massachusetts Drinking Water Regulations (310 CMR 22.00). These waters are designated for protection as Outstanding Resource Waters under 314 CMR 4.04(3).
- *SHELLFISH HARVESTING* (in SA and SB segments) – Class SA waters where designated shall be suitable for shellfish harvesting without depuration (Approved and Conditionally Approved Shellfish Areas); Class SB waters where designated shall be suitable for shellfish harvesting with depuration (Restricted and Conditionally Restricted Shellfish Areas).
- *PRIMARY CONTACT RECREATION* - suitable for any recreation or other water use in which there is prolonged and intimate contact with the water with a significant risk of ingestion of water. These include, but are not limited to, wading, swimming, diving, surfing and water skiing.
- *SECONDARY CONTACT RECREATION* - suitable for any recreation or other water use in which contact with the water is either incidental or accidental. These include, but are not limited to, fishing, including human consumption of fish, boating and limited contact incident to shoreline activities. Where designated, secondary contact recreation also includes shellfishing, including human consumption of shellfish. Human consumption of fish and shellfish are assessed as the *Fish Consumption* and *Shellfish Harvesting* uses, respectively.
- *AESTHETICS* - all surface waters shall be free from pollutants in concentrations or combinations that settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life.
- *AGRICULTURAL AND INDUSTRIAL* - suitable for irrigation or other agricultural process water and for compatible industrial cooling and process water.

The guidance used to assess the *Aquatic Life*, *Fish Consumption*, *Drinking Water*, *Shellfish Harvesting*, *Primary* and *Secondary Contact Recreation* and *Aesthetics* uses follows.

Note: Waterbodies affected by Combined Sewer Overflow (CSO) discharges are qualified in the standards, however, unless a variance has been granted and states otherwise, excursions from criteria are not allowed during storm events (designated uses are still applicable).

## Aquatic Life Use

This use is suitable for sustaining a native, naturally diverse, community of aquatic flora and fauna, including, but not limited to, wildlife and threatened and endangered species and for their reproduction, migration, growth and other critical functions. The results of biological (and habitat), toxicological, and chemical data are integrated to assess this use. The nature, frequency, and precision of the MassDEP's data collection techniques dictate that a weight of evidence be used to make the assessment, with biosurvey results used as the final arbiter of borderline cases. The following chart provides an overview of the guidance used to assess the status (support or impaired) of the *Aquatic Life Use*.

<b>Variable</b>	<b>Support</b> Data available clearly indicates support or minor modification of the biological community. Excursions from chemical criteria (Table 3) not frequent or prolonged and may be tolerated if the biosurvey results demonstrate support.	<b>Impaired</b> There are frequent or severe violations of chemical criteria, presence of acute toxicity, or a moderate or severe modification of the biological community.
<b>BIOLOGY</b>		
Rapid Bioassessment Protocol (RBP) III*	Non/Slightly impacted	Moderately or Severely Impacted
Fish Community	Best Professional Judgment (BPJ)	BPJ
Habitat and Flow	BPJ	Dewatered streambed due to artificial regulation or channel alteration, BPJ
Eelgrass Bed Habitat (Howes <i>et al.</i> 2003, Costello 2003)	Stable (No/minimal loss), BPJ	Loss/decline, BPJ
Non-native species	BPJ	Non-native species present, BPJ
Plankton/Periphyton	No/infrequent algal blooms	Frequent and/or prolonged algal blooms
<b>TOXICITY TESTS**</b>		
Water Column/Ambient	>75% survival either 48 hr or 7-day exposure	<75% survival either 48 hr or 7-day exposure
Sediment	≥75% survival	<75% survival
<b>CHEMISTRY-WATER**</b>		
Dissolved oxygen (DO) (MassDEP 2006, EPA 1997)	Infrequent excursion from criteria (Table 3), BPJ (minimum of three samples representing critical period)	Frequent and/or prolonged excursion from criteria [river and shallow lakes - exceedances >10% of representative measurements; deep lakes (with hypolimnion) - exceedances in the hypolimnetic area >10% of the surface area during maximum oxygen depletion].
pH (MassDEP 2006, EPA 1999a)	Infrequent excursion from criteria (Table 3)	Criteria exceeded >10% of measurements.
Temperature (MassDEP 2006, EPA 1997)	Infrequent excursion from criteria (Table 3) <sup>1</sup> CWF excursion based on mean of the daily maximum temperatures over a 7-day period.	Criteria exceeded >10% of measurements. CWF excursion based on mean of the daily maximum temperatures over a 7-day period.
Toxic Pollutants (MassDEP 2006, EPA 1999a) Ammonia-N (MassDEP 2006, EPA 1999b) Chlorine (MassDEP 2006, EPA 1999a)	Infrequent excursion from criteria (Table 3) Ammonia is pH and temperature dependent <sup>2</sup> 0.011 mg/L (freshwater) or 0.0075 mg/L (saltwater) total residual chlorine (TRC) <sup>3</sup>	Frequent and/or prolonged excursion from criteria (exceeded >10% of measurements).
<b>CHEMISTRY-SEDIMENT**</b>		
Toxic Pollutants (Persaud <i>et al.</i> 1993)	Concentrations ≤ Low Effect Level (L-EL), BPJ	Concentrations ≥ Severe Effect Level (S-EL) <sup>4</sup> , BPJ
<b>CHEMISTRY-TISSUE</b>		
PCB – whole fish (Coles 1998)	≤500 µg/kg wet weight	BPJ
DDT (Environment Canada 1999)	≤14.0 µg/kg wet weight	BPJ
PCB in aquatic tissue (Environment Canada 1999)	≤0.79 ng TEQ/kg wet weight	BPJ

\*RBP II analysis may be considered for assessment decision on a case-by-case basis. \*\*For identification of impairment, one or more of the following variables may be used to identify possible causes/sources of impairment: NPDES facility compliance with whole effluent toxicity test and other limits, turbidity and suspended solids data, nutrient (nitrogen and phosphorus) data for water column/sediments. <sup>1</sup>Maximum daily mean T in a month (minimum six measurements evenly distributed over 24-hours) less than criterion. <sup>2</sup>Saltwater is temperature dependent only. <sup>3</sup>The minimum quantification level for TRC is 0.05 mg/L. <sup>4</sup>For the purpose of this report, the S-EL for total polychlorinated biphenyl (PCB) compounds (PCB) in sediment (which varies with total organic carbon (TOC) content) with 1% TOC is 5.3 ppm while a sediment sample with 10% TOC is 53 ppm.

Note: National Academy of Sciences/National Academy of Engineering (NAS/NAE) guideline for maximum organochlorine concentrations (i.e., total PCB) in fish tissue for the protection of fish-eating wildlife is 500µg/kg wet weight (ppb, not lipid-normalized). PCB data (tissue) in this report are presented in µg/kg wet weight (ppb) and are not lipid-normalized to allow for direct comparison to the

### ***Fish Consumption Use***

Pollutants shall not result in unacceptable concentrations in edible portions of marketable fish or for the recreational use of fish, other aquatic life or wildlife for human consumption. The assessment of this use is made using the most recent list of Fish Consumption Advisories issued by the Massachusetts Executive Office of Health and Human Services, Department of Public Health (MA DPH), Bureau of Environmental Health Assessment (MA DPH 2008). The MA DPH list identifies waterbodies where elevated levels of a specified contaminant in edible portions of freshwater species pose a health risk for human consumption. Hence, the *Fish Consumption Use* is assessed as impaired in these waters.

In July 2001 MA DPH issued new consumer advisories on fish consumption and mercury contamination (MA DPH 2001).

1. The MA DPH "...is advising pregnant women, women of childbearing age who may become pregnant, nursing mothers and children under 12 years of age to refrain from eating the following marine fish; shark, swordfish, king mackerel, tuna steak and tilefish. In addition, MA DPH is expanding its previously issued statewide fish consumption advisory which cautioned pregnant women to avoid eating fish from all freshwater bodies due to concerns about mercury contamination, to now include women of childbearing age who may become pregnant, nursing mothers and children under 12 years of age (MA DPH 2001)."
2. Additionally, MA DPH "...is recommending that pregnant women, women of childbearing age who may become pregnant, nursing mothers and children under 12 years of age limit their consumption of fish not covered by existing advisories to no more than 12 ounces (or about 2 meals) of cooked or uncooked fish per week. This recommendation includes canned tuna, the consumption of which should be limited to 2 cans per week. Very small children, including toddlers, should eat less. Consumers may wish to choose to eat light tuna rather than white or chunk white tuna, the latter of which may have higher levels of mercury (MA DPH 2001)."

Other statewide advisories that MA DPH has previously issued and are still in effect are as follows (MA DPH 2001):

1. Due to concerns about chemical contamination, primarily from polychlorinated biphenyls (PCB) and other contaminants, no individual should consume lobster tomalley from any source. Lobster tomalley is the soft green substance found in the tail and body section of the lobster.
2. Pregnant and breastfeeding women and those who are considering becoming pregnant should not eat bluefish due to concerns about PCB contamination in this species.

The following is an overview of EPA's guidance used to assess the status (support or impaired) of the *Fish Consumption Use*. Because of the statewide advisory no waters can be assessed as support for the *Fish Consumption Use*. Therefore, if no site-specific advisory is in place, the *Fish Consumption Use* is not assessed.

<b><i>Variable</i></b>	<b><i>Support</i></b> No restrictions or bans in effect	<b><i>Impaired</i></b> There is a "no consumption" advisory or ban in effect for the general population or a sub-population for one or more fish species or there is a commercial fishing ban in effect.
MA DPH Fish Consumption Advisory List	Not applicable, precluded by statewide advisory (Hg)	Waterbody on MA DPH Fish Consumption Advisory List

Note: The MA DPH statewide advisory does not include fish stocked by the state Division of Fisheries and Wildlife or farm-raised fish sold commercially.

**Northeast Regional Mercury TMDL:** On 20 December 2007 the U.S. EPA approved the Northeast Regional Mercury Total Maximum Daily Load (TMDL). This TMDL is a Federal Clean Water Act mandated document that identifies pollutant load reductions necessary for regional waterbodies to meet and maintain compliance with state and federal water quality standards. It was prepared by the New England Interstate Water Pollution Control Commission (NEIWPCC) in cooperation with the states of

Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. The TMDL covers inland waterbodies that are impaired primarily due to atmospheric deposition of mercury (Northeast States 2007). The TMDL target for Massachusetts is 0.3 ppm or less of mercury in fish tissue. The plan calls for a 75% reduction of in-region and out of region atmospheric sources by 2010 and a 90% or greater reduction in the future (NEIWPCC 2007). The TMDL will be reassessed in 2010 based on an evaluation of new on-going monitoring and air deposition data. Final targets will be determined at that time.

### **Drinking Water Use**

The term *Drinking Water Use* denotes those waters used as a source of public drinking water. These waters may be subject to more stringent regulation in accordance with the Massachusetts Drinking Water Regulations (310 CMR 22.00). They are designated for protection as Outstanding Resource Waters in 314 CMR 4.04(3). MassDEP's Drinking Water Program (DWP) has primacy for implementing the provisions of the federal Safe Drinking Water Act (SDWA). Except for suppliers with surface water sources for which a waiver from filtration has been granted (these systems also monitor surface water quality) all public drinking water supplies are monitored as finished water (tap water). Monitoring includes the major categories of contaminants established in the SDWA: bacteria, volatile and synthetic organic compounds, inorganic compounds and radionuclides. The DWP maintains current drinking supply monitoring data. The suppliers currently report to MassDEP and EPA the status of the supplies on an annual basis in the form of a consumer confidence report (<http://yosemite.epa.gov/ogwdw/ccr.nsf/Massachusetts>). Below is EPA's guidance to assess the status (support or impaired) of the drinking water use.

<b>Variable</b>	<b>Support</b>	<b>Impaired</b>
	No closures or advisories (no contaminants with confirmed exceedances of maximum contaminant levels, conventional treatment is adequate to maintain the supply).	Has one or more advisories or more than conventional treatment is required or has a contamination-based closure of the water supply.
Drinking Water Program (DWP) Evaluation	See note below	See note below

Note: While this use is not assessed in this report, information on drinking water source protection and finish water quality is available at <http://www.mass.gov/dep/water/drinking.htm> and from local public water suppliers.

### **Shellfishing Use**

This use is assessed using information from the Department of Fish and Game's Division of Marine Fisheries (DMF). A designated shellfish growing area is an area of potential shellfish habitat. Growing areas are managed with respect to shellfish harvest for direct human consumption, and comprise at least one or more classification areas. The classification areas are the management units, and range from being approved to prohibited (described below) with respect to shellfish harvest. Shellfish areas under management closures are *not* assessed. Not enough testing has been done in these areas to determine whether or not they are fit for shellfish harvest, therefore, they are closed for the harvest of shellfish.

<b>Variable</b>	<b>Support</b>	<b>Impaired</b>
	SA Waters: Approved <sup>1</sup> SB Waters: Approved <sup>1</sup> , Conditionally Approved <sup>2</sup> , or Restricted <sup>3</sup>	SA Waters: Conditionally Approved <sup>2</sup> , Restricted <sup>3</sup> , Conditionally Restricted <sup>4</sup> , or Prohibited <sup>5</sup> SB Waters: Conditionally Restricted <sup>4</sup> or Prohibited <sup>5</sup>
DMF Shellfish Project Classification Area Information (MA DFG 2000)	Reported by DMF	Reported by DMF

NOTE: Designated shellfish growing areas may be viewed using the MassGIS data layer available from MassGIS at <http://www.mass.gov/mgis/dsga.htm>. This coverage currently reflects classification areas as of July 1, 2000.

<sup>1</sup> **Approved** - "...open for harvest of shellfish for direct human consumption subject to local rules and regulations..." An approved area is open all the time and closes only due to hurricanes or other major coast wide events.

<sup>2</sup> **Conditionally Approved** - "...subject to intermittent microbiological pollution..." During the time the area is open, it is "...for harvest of shellfish for direct human consumption subject to local rules and regulations..." A conditionally approved area is closed some of the time due to runoff from rainfall or seasonally poor water quality. When open, shellfish harvested are treated as from an approved area.

<sup>3</sup> **Restricted** - area contains a "limited degree of pollution." It is open for "harvest of shellfish with depuration subject to local rules and state regulations" or for the relay of shellfish. A restricted area is used by DMF for the relay of shellfish to a less contaminated area.

<sup>4</sup> **Conditionally Restricted** - "...subject to intermittent microbiological pollution..." During the time area is restricted, it is only open for "the harvest of shellfish with depuration subject to local rules and state regulations." A conditionally restricted area is closed some of the time due to runoff from rainfall or seasonally poor water quality. When open, only soft-shell clams may be harvested by specially licensed diggers (Master/Subordinate Diggers) and transported to the DMF Shellfish Purification Plant for depuration (purification).

<sup>5</sup> **Prohibited** - Closed for harvest of shellfish.

### ***Primary Contact Recreation Use***

This use is suitable for any recreational or other water use in which there is prolonged and intimate contact with the water with a significant risk of ingestion of water during the primary contact recreation season (1 April to 15 October). These include, but are not limited to, wading, swimming, diving, surfing and water skiing. The chart below provides an overview of the guidance used to assess the status (support or impaired) of the *Primary Contact Recreation Use*. Excursions from criteria due to natural conditions are not considered impairment of use.

<b>Variable</b>	<b>Support</b> Criteria are met, no aesthetic conditions that preclude the use	<b>Impaired</b> Frequent or prolonged violations of criteria and/or formal bathing area closures, or severe aesthetic conditions that preclude the use
Bacteria (105 CMR 445.000) Minimum Standards for Bathing Beaches State Sanitary Code) (MassDEP 2006)	At "public bathing beach" areas: Formal beach postings/advisories neither frequent nor prolonged during the swimming season (the number of days posted or closed cannot exceed 10% during the locally operated swimming season).  Collected samples* meet the geometric mean criteria (Table 3).  Shellfish Growing Area classified as "Approved by DMF.	At "public bathing beach" areas: Formal beach closures/postings >10% of time during swimming season (the number of days posted or closed exceeds 10% during the locally operated swimming season).  Collected samples* do not meet the geometric mean criteria (Table 3).
<i>Aesthetics (MassDEP 1996) - All surface waters shall be free from pollutants in concentrations or combinations that settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance [growth or amount] species of aquatic life</i>		
Odor, oil and grease, color and turbidity, floating matter	Narrative "free from" criteria met or excursions neither frequent nor prolonged, BPJ.	Narrative "free from" criteria not met - objectionable conditions either frequent and/or prolonged, BPJ.
Transparency (MA DPH 1969)	Public bathing beach and lakes – Secchi disk depth $\geq 1.2$ meters ( $\geq 4'$ ) (minimum of three samples representing critical period).	Public bathing beach and lakes - Secchi disk depth $< 1.2$ meters ( $< 4'$ ) (minimum of three samples representing critical period).
Nuisance organisms	No overabundant growths (i.e., blooms) that render the water aesthetically objectionable or unusable, BPJ.	Overabundant growths (i.e., blooms and/or non-native macrophyte growth dominating the biovolume) rendering the water aesthetically objectionable and/or unusable, BPJ.

\* Data sets to be evaluated for assessment purposes must be representative of a sampling location (at least five samples per station recommended) and the season being analyzed, as described in the SWQS (see Table 1). Samples collected on one date from multiple stations on a river are not considered adequate to assess this designated use. Because of low sample frequency (i.e., less than ten samples per station) an impairment decision will not be based on a single sample exceedance (i.e., the geometric mean of five samples is  $< 126$  *E. coli* colonies/100 ml but one of the five sample exceeds 235 *E. coli* colonies/100 ml). The method detection limit (MDL) will be used in the calculation of the geometric mean when data are reported as less than the MDL (e.g., use 20 cfu/100 ml if the result is reported as  $< 20$  cfu/100 ml). Those data reported as too numerous to count (TNTC) will not be used in the geometric mean calculation; however frequency of TNTC sample results should be presented.

## Secondary Contact Recreation Use

This use is suitable for any recreation or other water use in which contact with the water is either incidental or accidental. These include, but are not limited to, fishing, boating and limited contact incident to shoreline activities. Following is an overview of the guidance used to assess the status (support or impaired) of the *Secondary Contact Use*. Excursions from criteria due to natural conditions are not considered impairment of use.

<b>Variable</b>	<b>Support</b> Criteria are met, no aesthetic conditions that preclude the use	<b>Impaired</b> Frequent or prolonged violations of criteria, or severe aesthetic conditions that preclude the use
Bacteria (MassDEP 2006)	Collected samples* meet the Class C or SC geometric mean criteria (see Table 3).  Shellfish Growing Area classified as "Approved" by DMF.	Collected samples* do not meet the Class C or SC geometric mean criteria (see Table 3).
<i>Aesthetics (MassDEP 2006) - All surface waters shall be free from pollutants in concentrations or combinations that settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance [growth or amount] species of aquatic life</i>		
Odor, oil and grease, color and turbidity, floating matter	Narrative "free from" criteria met or excursions neither frequent nor prolonged, BPJ.	Narrative "free from" criteria not met - objectionable conditions either frequent and/or prolonged, BPJ.
Transparency (MA DPH 1969)	Public bathing beach and lakes – Secchi disk depth $\geq 1.2$ meters ( $\geq 4'$ ) (minimum of three samples representing critical period).	Public bathing beach and lakes - Secchi disk depth $< 1.2$ meters ( $< 4'$ ) (minimum of three samples representing critical period).
Nuisance organisms	No overabundant growths (i.e., blooms) that render the water aesthetically objectionable or unusable, BPJ.	Overabundant growths (i.e., blooms and/or non-native macrophyte growth dominating the biovolume) rendering the water aesthetically objectionable and/or unusable, BPJ.

\*Data sets to be evaluated for assessment purposes must be representative of a sampling location (at least five samples per station recommended) over time. Because of low sample frequency (i.e., less than ten samples per station) an impairment decision will not be based on a single sample exceedance. Samples collected on one date from multiple stations on a river are not considered adequate to assess this designated use.

## Aesthetics Use

All surface waters shall be free from pollutants in concentrations or combinations that settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life. The aesthetic use is closely tied to the public health aspects of the recreational uses (swimming and boating). Below is an overview of the guidance used to assess the status (support or impaired) of the *Aesthetics Use*.

<b>Variable</b>	<b>Support</b> Narrative "free from" criteria met	<b>Impaired</b> Objectionable conditions frequent and/or prolonged
Odor, oil and grease, color and turbidity, floating matter	Narrative "free from" criteria met or excursions neither frequent nor prolonged, BPJ.	Narrative "free from" criteria not met - objectionable conditions either frequent and/or prolonged, BPJ.
Transparency (MA DPH 1969)	Public bathing beach and lakes – Secchi disk depth $\geq 1.2$ meters ( $\geq 4'$ ) (minimum of three samples representing critical period).	Public bathing beach and lakes - Secchi disk depth $< 1.2$ meters ( $< 4'$ ) (minimum of three samples representing critical period).
Nuisance organisms	No overabundant growths (i.e., blooms) that render the water	Overabundant growths (i.e., blooms and/or non-native macrophyte growth

	aesthetically objectionable or unusable, BPJ.	dominating the biovolume) rendering the water aesthetically objectionable and/or unusable, BPJ.
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## SPECIAL NOTES

In the data summary of some segments, there is a reference to special notes. Special notes refer to unique assessment situations that apply to several segments and are best described in a separate section rather than repeated for each segment. The special notes for this assessment report are as follows.

1. **MA DCR Fecal Coliform Data** - Currently, the MassDEP uses *Escherichia coli* as their indicator species for water quality criteria so the MA DCR bacteria data cannot be directly compared to the water quality criteria. However, *Escherichia coli* is a subset of fecal coliform so the bacterium counts from the MA DCR data can be seen as a maximum possible *Escherichia coli* counts. Based on this fact, the MA DCR fecal coliform data can be compared to the *Escherichia coli* water quality criteria to determine if the segment supports primary contact or secondary contact. An assessment of impaired is not possible with MA DCR fecal coliform data due to the uncertainty of the portion of *Escherichia coli* in the exceeded samples. If the MA DCR fecal coliform data does violate MassDEP *Escherichia coli* water quality standards an Alert Status will be noted.
  
2. **Northeast Regional Mercury TMDL** - On 20 December 2007 the U.S. EPA approved the Northeast Regional Mercury Total Maximum Daily Load (TMDL). This TMDL is a Federal Clean Water Act mandated document that identifies pollutant load reductions necessary for regional waterbodies to meet and maintain compliance with state and federal water quality standards. It was prepared by the New England Interstate Water Pollution Control Commission (NEIWPCC) in cooperation with the states of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. The TMDL covers inland waterbodies that are impaired primarily due to atmospheric deposition of mercury (Northeast States 2007). The TMDL target for Massachusetts is 0.3 ppm or less of mercury in fish tissue. The plan calls for a 75% reduction of in-region and out-of-region atmospheric sources by 2010 and a 90% or greater reduction in the future (NEIWPCC 2007). The TMDL will be reassessed in 2010 based on an evaluation of new, on-going monitoring and air deposition data. Final targets will be determined at that time.
  
3. **Statewide Fish Consumption Advisory due to Mercury Contamination** - In July 2001 MA DPH issued new consumer advisories on fish consumption and mercury contamination (MA DPH 2001). The MA DPH "...is advising pregnant women, women of childbearing age who may become pregnant, nursing mothers and children under 12 years of age to refrain from eating the following marine fish; shark, swordfish, king mackerel, tuna steak and tilefish. In addition, MA DPH is expanding its previously issued statewide fish consumption advisory which cautioned pregnant women to avoid eating fish from all freshwater bodies due to concerns about mercury contamination, to now include women of childbearing age who may become pregnant, nursing mothers and children under 12 years of age (MA DPH 2001)." Additionally, MA DPH "...is recommending that pregnant women, women of childbearing age who may become pregnant, nursing mothers and children under 12 years of age limit their consumption of fish not covered by existing advisories to no more than 12 ounces (or about 2 meals) of cooked or uncooked fish per week. This recommendation includes canned tuna, the consumption of which should be limited to 2 cans per week. Very small children, including toddlers, should eat less. Consumers may wish to choose to eat light tuna rather than white or chunk white tuna, the latter of which may have higher levels of mercury (MA DPH 2001)."

**MALDEN BROOK (SEGMENT MA81-27)**

Location: Headwaters northeast of Lee Street, West Boylston, to the inlet of Wachusett Reservoir (Thomas Basin), West Boylston.

Segment Length: 1.9 Miles

Classification: Class A

2006 Integrated List of Waters: Category 2 - Attaining Some Uses: Other Uses Not Assessed - Uses

Attained: Aquatic Life, Primary Contact, Secondary Contact

NPDES Discharges: None

WMA Withdrawals: Wachusett Country Club (21132102)

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Support</b>	<b>Yes</b>
<p>A MA DFG fish population sample collected in 2004 was dominated by eastern brook trout (<i>Salvelinus fontinalis</i>). Of the 62 individual fish collected 43 or 69 percent were identified as eastern brook trout of varying size classes. Eastern brook trout are a cold-water species classified as fluvial specialist and pollution intolerant. The dominance of a reproducing eastern brook trout population indicates excellent water quality. The fisheries data indicate that cold-water fishery is an existing use for this segment. MA DCR collected a total of 101 temperature measurements at one site from 2001 through 2005. Five of the measurements exceeded 20.0°C and the maximum temperature was 21.0°C. MA DCR collected total phosphorus samples 12 times in 2001 and 5 times in 2005 at one site. The mean total phosphorus concentrations in 2001 and 2005 were 0.058 mg/L and 0.057 mg/L, respectively. An Alert Status is identified for this use due to elevated total phosphorus concentrations.</p> <p style="text-align: right;"><i>Data Sources: 5, 8, 9, 12</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means of the samples collected during the primary contact season ranged from 22 CFU/100ml to 57 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means ranged from 15 CFU/100ml to 35 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
<p>No data were available to assess the Aesthetic Use.</p>		
<b>Recommendations</b>		
<p>Collect appropriate fish community and temperature data to evaluate the designation of this segment as a Cold Water Fishery in the Water Quality Standards.</p>		

Note: Drinking Water Use is also a designated use for this waterbody.

**UNNAMED TRIBUTARY "BOYLSTON BROOK" (SEGMENT MA81-34)**

Location: Unnamed tributary locally known as "Boylston Brook." Headwaters north of French Drive, Boylston, to the confluence with Potash Brook, Boylston.

Segment Length: 0.5 Miles

Classification: Class A

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 66 temperature measurements at one site from 2001 through 2005. None of the measurements exceeded 20.0°C and the maximum temperature was 20.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 5, 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means of the samples collected during the primary contact season ranged from 18 CFU/100ml to 98 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . An Alert Status is identified for this use due to occasional spikes in fecal coliform concentrations. <i>Data Sources: 5, 6, 7, 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means ranged from 16 CFU/100ml to 39 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 5, 6, 7, 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**MALAGASCO BROOK (SEGMENT MA81-29)**

Location: Headwaters southwest of Apron Hill, Boylston, through Pine Swamp to the inlet of Wachusett Reservoir (South Bay), Boylston.

Segment Length: 2.4 Miles

Classification: Class A

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown, Organic enrichment/Low DO, Pathogens

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>Yes</b>
<p>MA DCR collected a total of 100 temperature measurements at one site from 2001 through 2005. One of the measurements exceeded 20.0°C and the maximum temperature was 25.0°C. MA DCR collected total phosphorus samples 12 times in 2001 and 5 times in 2005 at one site. The mean total phosphorus concentrations in 2001 and 2005 were 0.037 mg/L and 0.057 mg/L, respectively. Insufficient data were available to assess the Aquatic Life Use. An Alert Status is identified for this use due to elevated total phosphorus concentrations.</p> <p style="text-align: right;"><i>Data Sources: 5, 8, 9</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means of the samples collected during the primary contact season ranged from 49 CFU/100ml to 97 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>. An Alert Status is identified for this use due to occasional spikes in fecal coliform concentrations.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means ranged from 23 CFU/100ml to 48 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
<p>No data were available to assess the Aesthetic Use.</p>		
<b>Recommendations</b>		
<p>Conduct water quality and biological monitoring to assess the Aquatic Life Use.</p>		

Note: Drinking Water Use is also a designated use for this waterbody.

**FRENCH BROOK (SEGMENT MA81-48)**

Location: Headwaters, west of Linden Street, Boylston, to the inlet of Wachusett Reservoir (Andrews Harbor), Boylston.

Segment Length: 1.4 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>Yes</b>
<p>MA DCR collected a total of 87 temperature measurements at one site from 2001 through 2005. Fifteen of the measurements exceeded 20.0°C and the maximum temperature was 25.0°C. MA DCR collected total phosphorus samples 12 times in 2001 and 5 times in 2005 at one site. The mean total phosphorus concentrations in 2001 and 2005 were 0.048 mg/L and 0.056 mg/L, respectively. Insufficient data were available to assess the Aquatic Life Use. An Alert Status is identified for this use due to elevated total phosphorus concentrations.</p> <p style="text-align: right;"><i>Data Sources: 5, 8, 9</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means of the samples collected during the primary contact season ranged from 23 CFU/100ml to 39 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means ranged from 14 CFU/100ml to 31 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
<p>No data were available to assess the Aesthetic Use.</p>		
<b>Recommendations</b>		
<p>Conduct water quality and biological monitoring to assess the Aquatic Life Use.</p>		

Note: Drinking Water Use is also a designated use for this waterbody.

**UNNAMED TRIBUTARY (SEGMENT MA81-50)**

Location: Unnamed tributary to Wachusett Reservoir from headwaters east of Linden Street, Boylston, to the inlet of Wachusett Reservoir (Hastings Cove), Boylston.

Segment Length: 1.3 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 82 temperature measurements at one site from 2001 through 2005. Two of the measurements exceeded 20.0°C and the maximum temperature was 21.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 5, 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means of the samples collected during the primary contact season ranged from 14 CFU/100ml to 33 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 5, 6, 7, 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means ranged from 15 CFU/100ml to 26 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 5, 6, 7, 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**MUDDY BROOK (SEGMENT MA81-28)**

Location: Headwaters west of Shrewsbury Street, West Boylston, to inlet of Wachusett Reservoir (South Bay), West Boylston.

Segment Length: 0.8 Miles

Classification: Class A

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>Yes</b>
<p>MA DCR collected a total of 100 temperature measurements at one site from 2001 through 2005. One of the measurements exceeded 20.0°C and the maximum temperature was 25.0°C. MA DCR collected total phosphorus samples 12 times in 2001 and 5 times in 2005 at one site. The mean total phosphorus concentrations in 2001 and 2005 were 0.074 mg/L and 0.042 mg/L, respectively. An Alert Status is identified for this use due to elevated total phosphorus concentrations. Insufficient data were available to assess the Aquatic Life Use.</p> <p style="text-align: right;"><i>Data Sources: 5, 8, 9</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means of the samples collected during the primary contact season ranged from 20 CFU/100ml to 40 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means ranged from 15 CFU/100ml to 25 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
<p>No data were available to assess the Aesthetic Use.</p>		
<b>Recommendations</b>		
<p>Conduct water quality and biological monitoring to assess the Aquatic Life Use.</p>		

Note: Drinking Water Use is also a designated use for this waterbody.

**UNNAMED TRIBUTARY (SEGMENT MA81-49)**

Location: Headwaters, outlet Carrolls Pond, West Boylston, to inlet Wachusett Reservoir, West Boylston.

Segment Length: 0.8 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>Yes</b>
<p>MA DCR collected a total of 101 temperature measurements at one site from 2001 through 2005. One of the measurements exceeded 20.0°C and the maximum temperature was 25.0°C. MA DCR collected total phosphorus samples 12 times in 2001 and 5 times in 2005 at one site. The mean total phosphorus concentrations in 2001 and 2005 were 0.032 mg/L and 0.051 mg/L, respectively. An Alert Status is identified for this use due to elevated total phosphorus concentrations. Insufficient data were available to assess the Aquatic Life Use.</p> <p style="text-align: right;"><i>Data Sources: 5, 8, 9</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means of the samples collected during the primary contact season ranged from 58 CFU/100ml to 118 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>. An Alert Status is identified for this use due to occasional spikes in fecal coliform concentrations.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means ranged from 41 CFU/100ml to 66 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
<p>No data were available to assess the Aesthetic Use.</p>		
<b>Recommendations</b>		
<p>Conduct water quality and biological monitoring to assess the Aquatic Life Use.</p>		

Note: Drinking Water Use is also a designated use for this waterbody.

**GATES BROOK (SEGMENT MA81-24)**

Location: Headwaters west of Prospect Street, West Boylston, to inlet Wachusett Reservoir (Gates Cove), West Boylston.

Segment Length: 3.4 Miles

Classification: Class A

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown, Pathogens

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Support</b>	<b>Yes</b>
<p>MA DFG collected fish population samples in 2001 at two sites. The majority of individuals (115 of 206) in the samples were trout (eastern brook trout (<i>Salvelinus fontinalis</i>) and brown trout (<i>Salmo Trutta</i>)) of varying size classes. Eastern brook trout and brown trout are cold-water species classified as fluvial specialists and pollution intolerant. The presence of reproducing eastern brook trout and brown trout populations indicates excellent water quality. The fisheries data indicate that cold-water fishery is an existing use for this segment. MA DCR collected a total of 562 temperature measurements at six sites from 2001 through 2005. Five of the measurements exceeded 20.0°C and the maximum temperature was 25.0°C. MA DCR collected total phosphorus samples 12 times in 2001 and 5 times in 2005 at one site. The mean total phosphorus concentrations in 2001 and 2005 were 0.059 mg/L and 0.034 mg/L, respectively. An Alert Status is identified for this use due to elevated total phosphorus concentrations.</p> <p style="text-align: right;"><i>Data Sources: 5, 8, 9, 12</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>Yes</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at six sites from 2001 through 2005. The annual geometric means of the samples collected at each site during the primary contact season ranged from 25 CFU/100ml to 230 CFU/100ml. These results do violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>, so an Alert Status is issued for this use.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at six sites from 2001 through 2005. The annual geometric means at the sites ranged from 16 CFU/100ml to 105 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
<p>No data were available to assess the Aesthetic Use.</p>		
<b>Recommendations</b>		
<p>Conduct bacteria source tracking to determine the source(s) of elevated bacteria levels within this segment.</p> <p>Collect appropriate fish community and temperature data to evaluate the designation of this segment as a Cold Water Fishery in the Water Quality Standards.</p>		

Note: Drinking Water Use is also a designated use for this waterbody.

**SCARLETTS BROOK (SEGMENT MA81-25)**

Location: Headwaters west of West Boylston Street (Route 12), West Boylston, to confluence with Gates Brook, West Boylston.

Segment Length: 0.5 Miles

Classification: Class A

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Pathogens

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 111 temperature measurements at two sites from 2004 through 2005. None of the measurements exceeded 20.0°C and the maximum temperature was 20.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 5, 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at two sites from 2004 through 2005. The annual geometric means of the samples collected at each site during the primary contact season ranged from 50 CFU/100ml to 56 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . An Alert Status is identified for this use due to occasional spikes in fecal coliform concentrations. <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at two sites from 2004 through 2005. The annual geometric means at the sites ranged from 27 CFU/100ml to 50 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**QUINAPOXET RIVER (SEGMENT MA81-32)**

Location: Outlet Quinapoxet Reservoir, Holden, to inlet of Wachusett Reservoir (Thomas Basin), West Boylston.

Segment Length: 7.9 Miles

Classification: Class A

2006 Integrated List of Waters: Category 4c - Impairment not Caused by a Pollutant - Flow Alteration

NPDES Discharges: Massachusetts Water Resources Authority Oakdale Power Station (MAG250025), issued April 2003 with authorization to discharge between 0.0122 and 0.144 MGD of non-contact cooling water to the Quinapoxet River.

WMA Withdrawals: RJ Paquette (21113406)

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Support</b>	<b>Yes</b>
<p>MA DFG collected fish population samples at three sites in 2001. All three samples were dominated by fluvial specialist/dependents. One of the samples contained a large (75 of 484 individuals) reproducing eastern brook trout (<i>Salvelinus fontinalis</i>) population. Eastern brook trout are a cold-water species classified as fluvial specialist and pollution intolerant. The fisheries data indicates that cold water fishery is an existing use for this segment. The other two samples had minimal numbers (&lt;10 individuals) of individuals classified as cold water. MassDEP DWM collected a benthic macroinvertebrate sample at one site in 2003. This site was used as the reference site for the 2003 Nashua River basin survey to determine if the other samples collected showed any impacts. The USGS has a continuous temperature station at Canadian Mills near Holden. A total of 2539 7-day rolling averages of daily maximum temperature were calculated using temperature data from 1999 through 2006. Approximately 21.4 percent of the 7-day rolling maximum temperature averages exceeded the cold-water temperature criterion of 20 C. MADCR collected a total of 285 temperature measurements at three sites from 2001 through 2005. Twenty-one of the measurements exceeded 20 C and the maximum temperature was 25.0 C. MADCR collected monthly total phosphorus samples at one site from 2001 through 2005. The annual mean total phosphorus concentrations ranged from 0.020 mg/L to 0.047 mg/L. In August of 1998 MassDEP DWM staff observed that a portion of this segment from the Quinapoxet Dam to the center of Holden was dry. An Alert Status is identified for this use due to historical observations of dry channels and high temperatures.</p> <p style="text-align: right;"><i>Data Sources: 4, 5, 6, 7, 8, 9, 21, 12, 22</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at three sites from 2001 through 2005. The annual geometric means of the samples collected at each site during the primary contact season ranged from 19 CFU/100ml to 93 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>. An Alert Status is identified for this use due to occasional spikes in fecal coliform concentrations.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at three sites from 2001 through 2005. The annual geometric means at the sites ranged from 41 CFU/100ml to 66 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		

<b>Aesthetics</b>	<b>Support</b>	<b>No</b>
MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.		
<i>Data Sources: 24</i>		
<b>Recommendations</b>		
Collect data to determine the frequency, duration, and spatial extent of the low/no flow conditions in the Quinapoxet River. Optimize withdrawal and release practices to maintain a minimum flow and natural flow regime in the Quinapoxet River.		
Collect appropriate fish community and temperature data to evaluate the designation of this segment as a Cold Water Fishery in the Water Quality Standards.		

Note: Drinking Water Use is also a designated use for this waterbody.

### **UNNAMED TRIBUTARY (SEGMENT MA81-59)**

Location: Headwaters southwest of Hog Hill, Sterling, to the confluence with the Quinapoxet River, Sterling.

Segment Length: 1.6 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 54 temperature measurements at one site from 2004 through 2005. None of the measurements exceeded 20.0°C and the maximum temperature was 20.0°C. Insufficient data were available to assess the Aquatic Life Use.		
<i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).		
<i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means of the samples collected during the primary contact season were 31 CFU/100ml and 41 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> .		
<i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means were 19 CFU/100ml to 24 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> .		
<i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		

<b>Recommendations</b>
Conduct water quality and biological monitoring to assess the Aquatic Life Use.

Note: Drinking Water Use is also a designated use for this waterbody.

### **TROUT BROOK (SEGMENT MA81-26)**

Location: Outlet Cournoyer Pond, Holden, to confluence with Quinapoxet River, Holden.

Segment Length: 1.9 Miles

Classification: Class A

2006 Integrated List of Waters: Category 2 - Attaining Some Uses: Other Uses Not Assessed - Uses

Attained: Aquatic Life, Primary Contact, Secondary Contact

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 61 temperature measurements at one site from 2004 through 2005. Two of the measurements exceeded 20.0°C and the maximum temperature was 20.9°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means of the samples collected during the primary contact season were 20 CFU/100ml and 29 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means were 15 CFU/100ml to 20 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**UNNAMED TRIBUTARY (SEGMENT MA81-51)**

Location: Headwaters south of Malden Street, Holden, to the confluence with the Quinapoxet River, Holden.

Segment Length: 1.5 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 61 temperature measurements at one site from 2004 through 2005. None of the measurements exceeded 20.0°C and the maximum temperature was 18.9°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means of the samples collected during the primary contact season were 67 CFU/100ml and 74 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . An Alert Status is identified for this use due to occasional spikes in fecal coliform concentrations. <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric mean was 34 CFU/100ml in both years. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**POOR FARM BROOK (SEGMENT MA81-52)**

Location: Headwaters east of Salisbury Street, Holden, to inlet Chaffin Pond, Holden.

Segment Length: 1.2 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 61 temperature measurements at one site from 2004 through 2005. None of the measurements exceeded 20.0°C and the maximum temperature was 20.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means of the samples collected during the primary contact season were 66 CFU/100ml and 73 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . An Alert Status is identified for this use due to occasional spikes in fecal coliform concentrations. <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means were 31 CFU/100ml to 38 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**CHAFFINS BROOK (SEGMENT MA81-33)**

Location: Headwaters south of Malden Street/west of Wachusett Street, Holden, to inlet of Unionville Pond, Holden.

Segment Length: 0.9 Miles

Classification: Class A

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown

NPDES Discharges: Alden Research Laboratory, Inc. (MA0028801), issued July 2006 with authorization to discharge 0.1 MGD (average monthly flow) of effluent to Chaffins Brook.

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 61 temperature measurements at one site from 2004 through 2005. Seven of the measurements exceeded 20.0°C and the maximum temperature was 21.1°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means of the samples collected during the primary contact season were 43 CFU/100ml and 44 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . An Alert Status is identified for this use due to occasional spikes in fecal coliform concentrations. <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means were 26 CFU/100ml to 30 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**UNNAMED TRIBUTARY "LOWER CHAFFINS BROOK" (SEGMENT MA81-35)**

Location: Locally known as "Lower Chaffin Brook" - Outlet Unionville Pond, Holden, to confluence with Quinapoxet River, Holden.

Segment Length: 0.5 Miles

Classification: Class A

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown, Organic enrichment/Low DO

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 61 temperature measurements at one site from 2004 through 2005. Twenty-two of the measurements exceeded 20.0°C and the maximum temperature was 25.3°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means of the samples collected during the primary contact season were 20 CFU/100ml and 21 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means were 15 CFU/100ml to 17 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**ASNEBUMSKIT BROOK (SEGMENT MA81-56)**

Location: From outlet Eagle Lake, Holden, to the confluence with the Quinapoxet River, Holden.

Segment Length: 2.9 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	
<p>ECC Corporation, from May 2001 through May 2005, conducted 16 toxicity tests (<i>C. dubia</i> or <i>P. promelas</i>) on ambient river water collected upstream from their discharge as part of their NPDES permit requirements and all toxicity tests had a survival rate above 75 percent after 48 hours. Annually, one ambient toxicity test was extended to seven days with renewals to test chronic toxicity. Since 2003 the <i>P. promelas</i> survival rate has ranged from 25 to 32 percent in the chronic toxicity tests. No evidence of chronic toxicity was observed with <i>C. dubia</i>. MA DCR collected a total of 122 temperature measurements at two sites from 2004 through 2005. Nine of the measurements exceeded 20.0°C and the maximum temperature was 23.0°C.</p> <p><b>Cause(s) of Impairment:</b> Ambient bioassays - chronic toxicity  <b>Source(s) of Impairment:</b> Unknown</p> <p style="text-align: right;"><i>Data Sources: 8, 9, 26</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>Yes</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at two sites from 2004 through 2005. The annual geometric means of the samples collected at each site during the primary contact season ranged from 45 CFU/100ml to 307 CFU/100ml. These results do violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>, so an Alert Status is identified for this use.</p> <p style="text-align: right;"><i>Data Sources: 8, 9</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at two sites from 2004 through 2005. The annual geometric means at the sites ranged from 32 CFU/100ml and 93 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 8, 9</i></p>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
<p>Conduct additional toxicity monitoring to confirm the toxicity data collected by the ECC Corporation. Conduct macroinvertebrate monitoring to determine if the benthic community is impacted by the instream toxicity.</p> <p>Conduct bacteria source tracking to determine the source(s) of elevated bacteria levels within this segment.</p>		

Note: Drinking Water Use is also a designated use for this waterbody.

**WARREN TANNERY BROOK (SEGMENT MA81-53)**

Location: Headwaters, north of Route 122A, Holden, to confluence with Asnebumskit Brook, Holden.

Segment Length: 1.4 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 61 temperature measurements at one site from 2004 through 2005. One of the measurements exceeded 20.0°C and the maximum temperature was 20.2°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means of the samples collected during the primary contact season were 41 CFU/100ml and 43 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . An Alert Status is identified for this use due to occasional spikes in fecal coliform concentrations. <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric mean was 25 CFU/100ml in both years. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**UNNAMED TRIBUTARY (SEGMENT MA81-58)**

Location: Headwaters west of Route 68, Rutland, to the confluence with an unnamed tributary to the Quinapoxet Reservoir west of Bryant Road, Holden.

Segment Length: 1.3 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>Yes</b>
<p>MA DCR collected a total of 60 temperature measurements at one site from 2001 through 2005. None of the measurements exceeded 20.0°C and the maximum temperature was 20.0°C. MA DCR collected total phosphorus samples 6 times in 2001 and 5 times in 2005 at one site. The mean total phosphorus concentrations in 2001 and 2005 were 0.020 mg/L and 0.108 mg/L, respectively. Insufficient data were available to assess the Aquatic Life Use. An Alert Status is identified for this use due to elevated total phosphorus concentrations.</p> <p style="text-align: right;"><i>Data Sources: 5, 8, 9</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means of the samples collected during the primary contact season ranged from 9 CFU/100ml to 39 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means ranged from 8 CFU/100ml to 48 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
<p>No data were available to assess the Aesthetic Use.</p>		
<b>Recommendations</b>		
<p>Conduct water quality and biological monitoring to assess the Aquatic Life Use.</p>		

Note: Drinking Water Use is also a designated use for this waterbody.

**STILLWATER RIVER (SEGMENT MA81-31)**

Location: Confluence of Justice and Keyes Brooks, Princeton/Sterling, to the inlet of Wachusett Reservoir (Stillwater Basin), Sterling.

Segment Length: 6.7 Miles

Classification: Class A

2006 Integrated List of Waters: Category 2 - Attaining Some Uses: Other Uses Not Assessed - Uses

Attained: Aquatic Life, Primary Contact, Secondary Contact

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Support</b>	<b>Yes</b>
<p>MA DFG collected fish population samples in 2005 at three sites. Individuals classified as fluvial specialists/dependant and pollution intolerant or moderately intolerant dominated the three samples. Landlocked salmon, a cold-water species, dominated two of the samples. The fisheries data indicates that cold water fishery is an existing use for this segment. MassDEP DWM biologists reviewed the benthic macroinvertebrate data collected between 2002 and 2004 as part of the NAWQA program. Metrics based on the 2003 NAWQA data were compared to metrics based on data collected in that same year from a reference site on the Quinapoxet River. Taxa richness, EPT index, and percent dominant taxon were the metrics used for the comparison. Based on best professional judgment and the comparisons of those three metrics, the macroinvertebrate community in this segment is not impaired. The USGS collected water quality samples and measurements from 2001 to 2005 at one site as part of the NAWQA program. Excluding pH, all of the USGS data met water quality criteria if they existed for the parameter in question. Approximately 40 percent of the 46 pH measurements violated the pH criterion. The violations of the pH criterion ranged from 6.0 to 6.4. The USGS has a continuous temperature station near Sterling. A total of 2551 7-day rolling averages of daily maximum temperature were calculated using temperature data from 2000 through 2006. Approximately 16.6 percent of the 7-day rolling maximum temperature averages exceeded the cold-water temperature criterion of 20 C. MADCR collected a total of 225 temperature measurements at two sites from 2001 through 2005. Twenty-seven of the measurements exceeded 20 C and the maximum temperature was 25.0 C. MADCR collected total phosphorus samples monthly at one site from 2001 through 2005. The mean total phosphorus concentrations ranged from 0.023 mg/L to 0.044 mg/L. An Alert Status is identified for this use due to high temperatures and low pH.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9, 23, 12</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at two sites from 2001 through 2005. The annual geometric means of the samples collected at each site during the primary contact season ranged from 50 CFU/100ml to 92 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>. An Alert Status is identified for this use due to occasional spikes in fecal coliform concentrations.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected weekly fecal coliform samples at two sites from 2001 through 2005. The annual geometric means at the sites ranged from 31 CFU/100ml to 39 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 5, 6, 7, 8, 9</i></p>		

<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Collect appropriate fish community and temperature data to evaluate the designation of this segment as a Cold Water Fishery in the Water Quality Standards.		

Note: Drinking Water Use is also a designated use for this waterbody.

### UNNAMED TRIBUTARY (SEGMENT MA81-54)

Location: Headwaters west of Route 140, West Boylston, to inlet of Wachusett Reservoir (Stillwater Basin), West Boylston.

Segment Length: 0.8 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 64 temperature measurements at one site from 2004 through 2005. None of the measurements exceeded 20.0°C and the maximum temperature was 18.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>Yes</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means of the samples collected during the primary contact season were 129 CFU/100ml and 85 CFU/100ml. These results do violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> , so an Alert Status is identified for this use. <i>Data Sources: 5, 6, 7, 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means were 47 CFU/100ml to 56 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use. Conduct bacteria source tracking to determine the source(s) of elevated bacteria levels within this segment.		

Note: Drinking Water Use is also a designated use for this waterbody.

**WASHACUM BROOK (SEGMENT MA81-47)**

Location: Headwaters, outlet West Washacum Pond, Sterling, to inlet of Wachusett Reservoir (Stillwater Basin), West Boylston.

Segment Length: 1.8 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 228 temperature measurements at two sites from 2001 through 2005. Fifty-nine of the measurements exceeded 20.0°C and the maximum temperature was 27.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 5, 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at three sites from 2001 through 2005. The annual geometric means of the samples collected at each site during the primary contact season ranged from 18 CFU/100ml to 68 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 5, 6, 7, 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at three sites from 2001 through 2005. The annual geometric means at the sites ranged from 14 CFU/100ml to 35 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 5, 6, 7, 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**CONNELLY BROOK (SEGMENT MA81-57)**

Location: Headwaters, southwest of Rowley Hill Road, Sterling, to the inlet of The Quag, Sterling.

Segment Length: 2.9 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 51 temperature measurements at one site from 2004 through 2005. Five of the measurements exceeded 20.0°C and the maximum temperature was 24.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means of the samples collected during the primary contact season were 26 CFU/100ml and 49 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means were 18 CFU/100ml and 29 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**HOUGHTON BROOK (SEGMENT MA81-55)**

Location: Headwaters south of Merrill Road, Sterling, to confluence with Stillwater River, Sterling.

Segment Length: 1.5 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 64 temperature measurements at one site from 2004 through 2005. Four of the measurements exceeded 20.0°C and the maximum temperature was 22.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means of the samples collected during the primary contact season were 47 CFU/100ml and 69 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means were 24 CFU/100ml and 32 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**SCANLON BROOK (SEGMENT MA81-44)**

Location: Headwaters, west of Birch Drive, Sterling, to the confluence with the Stillwater River, Sterling.

Segment Length: 1.5 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 56 temperature measurements at one site from 2004 through 2005. None of the measurements exceeded 20.0°C and the maximum temperature was 20.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means of the samples collected during the primary contact season were 36 CFU/100ml and 43 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . An Alert Status is identified for this use due to occasional spikes in fecal coliform concentrations. <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means were 20 CFU/100ml and 21 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**BALL BROOK (SEGMENT MA81-45)**

Location: Headwaters, north of Sterling Road, Holden, to the confluence with the Stillwater River, Sterling.

Segment Length: 1.6 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: Thompson Gardens (21128201)

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 41 temperature measurements at one site from 2004 through 2005. None of the measurements exceeded 20.0°C and the maximum temperature was 17.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means of the samples collected during the primary contact season were 44 CFU/100ml and 20 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . An Alert Status is identified for this use due to occasional spikes in fecal coliform concentrations. <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means were 16 CFU/100ml and 21 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**EAST WACHUSETT BROOK (SEGMENT MA81-30)**

Location: Headwaters northeast of Little Wachusett Mountain, Princeton, to confluence with Stillwater River, Sterling.

Segment Length: 4.6 Miles

Classification: Class A

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Pathogens

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 180 temperature measurements at three sites from 2004 through 2005. Nine of the measurements exceeded 20.0°C and the maximum temperature was 22.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at three sites from 2004 through 2005. The annual geometric means of the samples collected at each site during the primary contact season ranged from 18 CFU/100ml to 37 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at three sites from 2004 through 2005. The annual geometric means at the sites ranged from 14 CFU/100ml to 28 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**WILDER BROOK (SEGMENT MA81-43)**

Location: Headwaters west of Osgood Road, Sterling, to confluence with Stillwater River, Sterling.

Segment Length: 2.3 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 25 temperature measurements at one site from 2004 through 2005. None of the measurements exceeded 20.0°C and the maximum temperature was 17.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means of the samples collected during the primary contact season were 77 CFU/100ml and 110 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . An Alert Status is identified for this use due to occasional spikes in fecal coliform concentrations. <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means were 39 CFU/100ml and 49 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**ROCKY BROOK (SEGMENT MA81-42)**

Location: Headwaters, outlet Hy-Crest Pond, Sterling, to confluence with Stillwater River, Sterling.

Segment Length: 3.0 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 61 temperature measurements at one site from 2004 through 2005. None of the measurements exceeded 20.0°C and the maximum temperature was 19.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means of the samples collected during the primary contact season were 25 CFU/100ml and 28 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric means were 17 CFU/100ml and 23 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**UNNAMED TRIBUTARY (SEGMENT MA81-46)**

Location: Unnamed tributary to Rocky Brook from headwaters south of Upper North Row Road, Sterling, to the confluence with Rocky Brook, Sterling.

Segment Length: 0.7 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 64 temperature measurements at one site from 2001 through 2005. None of the measurements exceeded 20.0°C and the maximum temperature was 20.0°C. MA DCR collected total phosphorus samples 6 times in 2001 and 5 times in 2005 at one site. The mean total phosphorus concentrations in 2001 and 2005 were 0.016 mg/L and 0.017 mg/L, respectively. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 5, 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means of the samples collected during the primary contact season ranged from 6 CFU/100ml to 15 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 5, 6, 7, 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2001 through 2005. The annual geometric means were 3 CFU/100ml to 16 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 5, 6, 7, 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**KEYES BROOK (SEGMENT MA81-40)**

Location: Headwaters, outlet Paradise Pond, Princeton. to confluence with Justice Brook forming headwaters Stillwater River, Princeton/Sterling.

Segment Length: 3.2 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 182 temperature measurements at three sites from 2004 through 2005. Twenty-eight of the measurements exceeded 20.0°C and the maximum temperature was 25.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at three sites from 2004 through 2005. The annual geometric means of the samples collected at each site during the primary contact season ranged from 13 CFU/100ml to 44 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at three sites from 2004 through 2005. The annual geometric means at the sites ranged from 13 CFU/100ml to 24 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**JUSTICE BROOK (SEGMENT MA81-41)**

Location: Headwaters, outlet Stuart Pond, Sterling, to confluence with Keyes Brook forming headwaters Stillwater River, Princeton/Sterling.

Segment Length: 1.0 Miles

Classification: Class A

2006 Integrated List of Waters: Not Listed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DCR collected a total of 61 temperature measurements at one site from 2004 through 2005. Five of the measurements exceeded 20.0°C and the maximum temperature was 21.0°C. Insufficient data were available to assess the Aquatic Life Use. <i>Data Sources: 8, 9</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric mean of the samples collected during the primary contact season was 15 CFU/100ml in both years. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
See Special Note 1. MA DCR collected weekly fecal coliform samples at one site from 2004 through 2005. The annual geometric mean was 13 CFU/100ml in both years. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . <i>Data Sources: 8, 9</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**NASHUA RIVER "SOUTH BRANCH" (SEGMENT MA81-08)**

Location: ("South Branch" Nashua River) Outlet Lancaster Millpond, Clinton, to Clinton WWTP discharge, Clinton.

Segment Length: 2.8 Miles

Classification: Class B, WWF

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown, Unknown toxicity, Pathogens

NPDES Discharges: Weetabix Company, Inc. (MAG250759), issued February 2001 with authorization to discharge non-contact cooling water in the event of a failure of their closed-loop system to the South Branch Nashua River.

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Support</b>	<b>No</b>
<p>MA DFG collected a fish population sample at one site in 2002. Individuals classified as fluvial specialists and moderately pollution intolerant dominated the sample. In June of 2002 EPA-NERL collected three water samples at one site for toxicity analysis. The samples were analyzed at the EPA-NERL for 7-day chronic toxicity (<i>C. dubia</i>, <i>P. promelas</i>). Evidence of toxicity at this location was absent. MassDEP DWM measured dissolved oxygen, temperature, and pH five times at one site in 2003 and found no violations of the temperature, pH, or dissolved oxygen criteria. MassDEP DWM collected six total phosphorus samples at one site in 2003 and the concentrations ranged from 0.009 mg/L to 0.017 mg/L.</p> <p style="text-align: right;"><i>Data Sources: 12, 1, 24</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 35 CFU/100ml. This result does not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 35 CFU/100ml. This result does not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Aesthetics</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Recommendations</b>		
<p>Collect data to determine the frequency, duration, and spatial extent of the low flow conditions in the Nashua River. Optimize withdrawal and release practices from the Wachusett Reservoir to maintain a minimum flow and natural flow regime in the Nashua River.</p> <p>Continue monitoring total phosphorus concentrations and biological responses to evaluate the effectiveness of the Nashua River Total Phosphorus TMDL implementation.</p>		

**NASHUA RIVER "SOUTH BRANCH" (SEGMENT MA81-09)**

Location: ("South Branch" Nashua River) Clinton WWTP discharge, Clinton, to confluence with North Nashua River, Lancaster.

Segment Length: 1.8 Miles

Classification: Class B, WWF

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown, Nutrients-Pathogens, (Objectionable deposits\*) \* denotes a non-pollutant.

NPDES Discharges: Massachusetts Water Resources Authority (MA0100404), issued September 2000 with authorization to discharge from the Clinton Wastewater Treatment Plant an average monthly flow of 3.01 MGD of treated effluent to the South Branch Nashua River.

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Support</b>	<b>Yes</b>
<p>In June of 2002 EPA-NERL collected three water samples at one site for toxicity analysis. The samples were analyzed at the EPA-NERL for 7-day chronic toxicity (<i>C. dubia</i>, <i>P. promelas</i>). Evidence of toxicity at this location was absent. MassDEP DWM in 2003 and MassDEP CERO from 2001 through 2004 measured dissolved oxygen, temperature, and pH a total of 26 times at one site and found no violations of the temperature or dissolved oxygen criteria and two violations of the pH criterion. The pH violations ranged from 6.3 to 6.4. NRW, from 2001 through 2006, measured temperature a total of 36 times and pH a total of 33 times at one site and found no violations of the temperature criterion and four violations of the pH criterion. The pH violations ranged from 6.0 to 6.4. MassDEP DWM in 2003 and MassDEP CERO from 2001 through 2004 collected 26 total phosphorus samples at one site and the concentrations ranged from 0.021 mg/L to 0.250 mg/L. An Alert Status is identified for this use due to elevated total phosphorus concentrations.</p> <p style="text-align: right;"><i>Data Sources: 24, 25, 15, 16, 17, 18, 19, 20</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Impaired</b>	
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 189 CFU/100ml. NRW collected seven <i>Escherichia coli</i> samples at one site in 2006. The geometric mean of the samples collected during the primary contact season was 36 CFU/100ml. These results violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p><b>Cause(s) of Impairment:</b> <i>E. coli</i>  <b>Source(s) of Impairment:</b> Unknown</p> <p style="text-align: right;"><i>Data Sources: 24, 20</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 189 CFU/100ml. NRW collected seven <i>Escherichia coli</i> samples at one site in 2006. The annual geometric mean was 36 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24, 20</i></p>		

<b>Aesthetics</b>	<b>Support</b>	<b>Yes</b>
<p>MassDEP DWM in 2003 and MassDEP CERO from 2001 to 2004 recorded aesthetic field observations at one site. There were no field observations indicating prolonged or frequent occurrences of objectionable odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae. There were observations of trash on nearly all of the site visits by MassDEP CERO. An Alert Status is identified for this use due to trash.</p> <p style="text-align: right;"><i>Data Sources: 29, 24</i></p>		
<b>Recommendations</b>		
<p>Conduct bacteria source tracking to determine the source(s) of elevated bacteria levels within this segment.</p> <p>Continue monitoring total phosphorus concentrations and biological responses to evaluate the effectiveness of the Nashua River Total Phosphorus TMDL implementation.</p>		

### **WHITMAN RIVER (SEGMENT MA81-11)**

Location: Outlet Lake Wampanoag, Ashburnham, to inlet Snows Millpond, Fitchburg (excluding Whitmanville Reservoir, Segment MA81109 and Crocker Pond, Segment MA81025).

Segment Length: 6.3 Miles

Classification: Class B

2006 Integrated List of Waters: Category 2 - Attaining Some Uses: Other Uses Not Assessed - Uses

Attained: Aquatic Life, Aesthetics

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Support</b>	<b>No</b>
<p>MA DFG collected fish population samples at three sites in 2002. Individuals classified as fluvial specialists and moderately pollution intolerant dominated two of the samples. Individuals classified as macrohabitat generalist and pollution tolerant dominated the third sample. MassDEP DWM measured dissolved oxygen, temperature, and pH four times at one site in 2003 and found no violations of the temperature or dissolved oxygen criteria and four violations of the pH criterion. The pH violations ranged from 6.1 to 6.4. MassDEP DWM collected five total phosphorus samples at one site in 2003 and the concentrations ranged from 0.012 mg/L to 0.024 mg/L.</p> <p style="text-align: right;"><i>Data Sources: 12, 24</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 15 CFU/100ml. This result does not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 15 CFU/100ml. This result does not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		

Aesthetics	Support	No
MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.		
<i>Data Sources: 24</i>		
Recommendations		

### NORTH NASHUA RIVER (SEGMENT MA81-01)

Location: Outlet Snows Millpond, Fitchburg, to Fitchburg Paper Company Dam #1, Fitchburg.

Segment Length: 1.7 Miles

Classification: Class B, WWF, CSO

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown, Pathogens, (Other habitat alterations\*) \* denotes a non-pollutant.

NPDES Discharges: City of Fitchburg Wastewater Commission (MA0101281) authorizes the discharge from the West Fitchburg Wastewater Treatment Facility 10.5 MGD (average monthly flow) of treated sanitary sewage and industrial waste to the North Nashua River. As of December 2003 all domestic wastewater flows were diverted to the East Fitchburg Wastewater Treatment Plant. Three paper mills as well as occasional hauled wastewater currently generate all flow at the plant. The current average monthly flow is approximately 2.85 MGD.

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Support</b>	<b>Yes</b>
MassDEP DWM collected a benthic macroinvertebrate sample at one site. The RBP III metrics and score indicated that the macroinvertebrate community was slightly impacted by water quality. MA DFG collected fish population samples at two sites in 2002. Individuals classified as fluvial specialists/dependants and moderately pollution intolerant dominated the samples. West Fitchburg WWTP, from January 2000 through November 2007, conducted a total of 37 toxicity tests ( <i>C. dubia</i> ) on ambient river water collected upstream from their discharge as part of their NPDES permit requirements and none of tests had a survival rate below 75 percent after seven days. In June of 2002 EPA-NERL collected three water samples at one site for toxicity analysis. The samples were analyzed at the EPA-NERL for 7-day chronic toxicity ( <i>C. dubia</i> , <i>P. promelas</i> ). Evidence of toxicity at this location was absent. MassDEP DWM measured dissolved oxygen, temperature, and pH four times at one site in 2003 and found no violations of the temperature, pH, or dissolved oxygen criteria. MassDEP DWM collected five total phosphorus samples at one site in 2003 and the concentrations ranged from 0.009 mg/L to 0.019 mg/L. An Alert Status is identified for this use due to low RBP III metrics.		
<i>Data Sources: 4, 12, 26, 1, 24</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).		
<i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 39 CFU/100ml. This result does not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . An Alert Status is identified for this use due to occasional spikes in <i>Escherichia coli</i> concentrations and the presence of CSOs.		
<i>Data Sources: 24</i>		

<b>Secondary Contact</b>	<b>Support</b>	<b>Yes</b>
MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 39 CFU/100ml. This result does not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . An Alert Status is identified for this use due to occasional spikes in <i>Escherichia coli</i> concentrations and the presence of CSOs.		
<i>Data Sources: 24</i>		
<b>Aesthetics</b>	<b>Support</b>	<b>No</b>
MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.		
<i>Data Sources: 24</i>		
<b>Recommendations</b>		
Confirm that the CSOs discharging to this segment were eliminated and remove the CSO designation in the Water Quality Standards.		
Continue monitoring total phosphorus concentrations and biological responses to evaluate the effectiveness of the Nashua River Total Phosphorus TMDL implementation.		

### FLAG BROOK (SEGMENT MA81-10)

Location: Outlet Crocker Pond, Westminster, to confluence with North Nashua River, Fitchburg (excluding Sawmill Pond, Segment MA81118).

Segment Length: 2.2 Miles

Classification: Class B

2006 Integrated List of Waters: Category 3 - No Uses Assessed

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
NRWA, from 2004 through 2006, measured temperature a total of 14 times and pH a total of 13 times at one site and found no violations of the temperature criterion and one violation of the pH criterion. Insufficient data were available to assess the Aquatic Life Use.		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).		
<i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
NRWA collected five <i>Escherichia coli</i> samples at one site in 2006. The geometric mean of the samples collected during the primary contact season was 16 CFU/100ml. This result does not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> .		
<i>Data Sources: 20</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
NRWA collected five <i>Escherichia coli</i> samples at one site in 2006. The annual geometric means was 16 CFU/100ml. This result does not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> .		
<i>Data Sources: 20</i>		

<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
Data available includes aesthetic field observations from MassDEP DWM field sheets. However, a majority of the factors used to assess the Aesthetic Use were not observable due to water depth. Insufficient information is available to assess the Aesthetic Use.		
<i>Data Sources: 24</i>		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

### PHILLIPS BROOK (SEGMENT MA81-12)

Location: Outlet Winnekeag Lake, Ashburnham, to Westminster Street (Route 2A/31), Fitchburg.

Segment Length: 8.4 Miles

Classification: Class B

2006 Integrated List of Waters: Category 3 - No Uses Assessed

NPDES Discharges: Flo Chemical Corporation (MAG250957), issued July 2002 with authorization to discharge 0.064 MGD of non-contact cooling water to Phillips Brook.

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Support</b>	<b>Yes</b>
MA DFG collected fish population samples at three sites in 2002. Individuals classified as fluvial specialists/dependants and pollution tolerant dominated all three samples. One of the samples contained 23 eastern brook trout ( <i>Salvelinus fontinalis</i> ) of varying sizes. The presence of a reproducing population of eastern brook trout indicates excellent water quality. The fisheries data indicate that cold-water fishery is an existing use for this segment. MassDEP DWM measured dissolved oxygen, temperature, and pH four times at one site in 2003 and found no violations of the temperature, pH, or dissolved oxygen criteria. MassDEP DWM collected five total phosphorus samples at one site in 2003 and the concentrations ranged from 0.014 mg/L to 0.082 mg/L. NRWA, from 2002 through 2004, measured temperature a total of 28 times and pH a total of 25 times at three sites and found no violations of the temperature criterion and 17 violations of the pH criterion. There were two violations in 2002 at 6.3, nine violations in 2003 ranging from 5.1 to 6.4, and six violations in 2004 ranging from 6.2 to 6.4. The severe pH violations are limited to the 2003 measurements. An Alert Status is identified for this use due to a low fish count (n=22) in one of the fish population samples and low pH.		
<i>Data Sources: 12, 24, 16, 17, 18</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).		
<i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 125 CFU/100ml. This result does not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . An Alert Status is identified for this use due to occasional spikes in <i>Escherichia coli</i> concentrations.		
<i>Data Sources: 24</i>		

Secondary Contact	Support	Yes
MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 125 CFU/100ml. This result does not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> . An Alert Status is identified for this use due to occasional spikes in <i>Escherichia coli</i> concentrations.		
Data Sources: 24		
Aesthetics	Support	No
MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.		
Data Sources: 24		
Recommendations		
Collect appropriate fish community and temperature data to evaluate the designation of this segment as a Cold Water Fishery in the Water Quality Standards.		

### NORTH NASHUA RIVER (SEGMENT MA81-02)

Location: Fitchburg Paper Company Dam #1, Fitchburg, to the Fitchburg East WWTP outfall, Leominster.

Segment Length: 6.9 Miles

Classification: Class B, WWF, CSO

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown, Unknown toxicity, Pathogens, Taste/Odor/Color, (Objectionable deposits\*) \* denotes a non-pollutant.

NPDES Discharges: Simonds Industries, Inc. (MAG250022), issued December 2003 with authorization to discharge non-contact cooling water to the North Nashua River.

WMA Withdrawals: Munksjo Paper Inc (9P21109701)

Designated Use	Use Assessment	Alert
Aquatic Life	Impaired	
<p>MassDEP DWM collected two benthic macroinvertebrate samples at one site in 2003. Based on the RBP III metrics and scores, one of the samples was classified as moderately impacted, while the other was classified as slightly impacted. MA DFG collected fish population samples at two sites in 2003. The two samples were dominated by individuals classified as fluvial specialists/dependant and contained high numbers of species and individual fish. East Fitchburg WWTP from January 2000 through October 2007 conducted 36 toxicity tests (<i>C. dubia</i>, <i>P. promelas</i>) on ambient river water as part of their NPDES permit requirements and 15 of the tests had survival rates below 75 percent after 7 days. All of the toxicity tests with survival rates below 75 percent involved <i>P. promelas</i>. MassDEP DWM measured dissolved oxygen, temperature, and pH four times at one site in 2003 and found no violations of the water quality criteria for those parameters. MassDEP DWM collected six total phosphorus samples at one site in 2003 and the concentrations ranged from 0.011 mg/L to 0.065 mg/L. NRWA from 2002 through 2006 measured temperature a total of 33 times and pH a total of 30 times at three sites and found no violations of the temperature criterion and three violations of the pH criterion.</p> <p><b>Cause(s) of Impairment:</b> Aquatic macroinvertebrate bioassessments, ambient bioassay - chronic toxicity</p> <p><b>Source(s) of Impairment:</b> Unknown</p> <p>Data Sources: 4, 12, 26, 24, 16, 17, 18, 19, 20</p>		

<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Impaired</b>	
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 1844 CFU/100ml. NRWA collected five <i>Escherichia coli</i> samples at one site in 2006. The geometric mean of the samples collected during the primary contact season was 31 CFU/100ml. These results violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p><b>Cause(s) of Impairment:</b> <i>E. coli</i>  <b>Source(s) of Impairment:</b> Wet weather discharges (point source and combination of stormwater, SSO or CSO), illicit connection/hook-up to storm sewers, unknown</p> <p style="text-align: right;"><i>Data Sources: 24, 20, 32</i></p>		
<b>Secondary Contact</b>	<b>Impaired</b>	
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 1844 CFU/100ml. NRWA collected five <i>Escherichia coli</i> samples at one site in 2006. The geometric mean was 31 CFU/100ml. These results violate the geometric mean criterion (630 CFU/100ml) and for <i>Escherichia coli</i>.</p> <p><b>Cause(s) of Impairment:</b> <i>E. coli</i>  <b>Source(s) of Impairment:</b> Wet weather discharges (point source and combination of stormwater, SSO or CSO), illicit connection/hook-up to storm sewers, unknown</p> <p style="text-align: right;"><i>Data Sources: 24, 20, 32</i></p>		
<b>Aesthetics</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Recommendations</b>		
<p>Conduct additional toxicity monitoring to confirm the toxicity data collected by the ECC East Fitchburg WWTP. Conduct source tracking to determine the source(s) of toxicity.</p> <p>Conduct bacteria source tracking to determine the source(s) of elevated bacteria levels within this segment.</p> <p>Continue monitoring total phosphorus concentrations and biological responses to evaluate the effectiveness of the Nashua River Total Phosphorus TMDL implementation.</p>		

**NORTH NASHUA RIVER (SEGMENT MA81-03)**

Location: Fitchburg East WWTP outfall, Leominster, to the Leominster WWTP outfall, Leominster.

Segment Length: 1.6 Miles

Classification: Class B, WWF, CSO

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown, Unknown toxicity, Pathogens, Taste/Odor/Color, Turbidity

NPDES Discharges: City of Fitchburg Wastewater Commission (MA0100986), issued September 2002 with authorization to discharge from the East Fitchburg Wastewater Treatment Facility 12.4 MGD (average monthly flow) of treated wastewater effluent to the North Nashua River.

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Support</b>	<b>Yes</b>
<p>MassDEP DWM collected a benthic macroinvertebrate sample at one site in 2003. The RBP III metrics and score indicated that the macroinvertebrate community is slightly impacted by water quality. MA DFG collected a fish population sample in 2002 at one site. Individuals classified as fluvial specialists/dependants and pollution tolerant dominated the samples. In June of 2002 EPA-NERL collected three water samples at one site for toxicity analysis. The samples were analyzed at the EPA-NERL for 7-day chronic toxicity (<i>C. dubia</i>, <i>P. promelas</i>). Evidence of toxicity at this location was absent. MassDEP DWM measured dissolved oxygen, temperature, and pH four times at one site in 2003 and found no violations of the temperature, pH, or dissolved oxygen criteria. MassDEP DWM collected five total phosphorus samples at one site in 2003 and the concentrations ranged from 0.036 mg/L to 0.12 mg/L. An Alert Status is identified for this use due to elevated total phosphorus concentrations and low RBP III metrics.</p> <p style="text-align: right;"><i>Data Sources: 4, 12, 1, 24</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Impaired</b>	
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 609 CFU/100ml. NRWA collected five <i>Escherichia coli</i> samples at one site in 2006. The geometric mean of the samples collected during the primary contact season was 100 CFU/100ml. These results violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p><b>Cause(s) of Impairment:</b> <i>E. coli</i>  <b>Source(s) of Impairment:</b> Wet weather discharges (point source and combination of stormwater, SSO or CSO), unknown</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>Yes</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 609 CFU/100ml. NRWA collected five <i>Escherichia coli</i> samples at one site in 2006. The geometric mean was 100 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>. An Alert Status is identified for this use due to occasional spikes in <i>Escherichia coli</i> concentrations.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		

<b>Aesthetics</b>	<b>Support</b>	<b>Yes</b>
<p>MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae. An Alert Status is identified for this segment due to observations of moderate filamentous algae cover in May and June.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Recommendations</b>		
<p>Conduct bacteria source tracking to determine the source(s) of elevated bacteria levels within this segment.</p> <p>Continue monitoring total phosphorus concentrations and biological responses to evaluate the effectiveness of the Nashua River Total Phosphorus TMDL implementation.</p>		

### **MONOOSNUC BROOK (SEGMENT MA81-13)**

Location: Outlet of Simonds Pond, Leominster, to confluence with North Nashua River, Leominster (thru former pond Segments MA81101, Pierce Pond, and MA81112, Rockwell Pond).

Segment Length: 6.1 Miles

Classification: Class B

2006 Integrated List of Waters: Category 3 - No Uses Assessed

NPDES Discharges: City of Leominster Department of Public Works (MAG640016), issued November 2004 with authorization to discharge 0.15 MGD from the NoTown Water Treatment Plant to Monoosnuc Brook in Leominster.

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Support</b>	<b>No</b>
<p>MA DFG collected a fish population sample at one site in 2002. Individuals classified as fluvial specialist/dependant and pollution tolerant dominated the sample. MassDEP DWM measured dissolved oxygen, temperature, and pH four times at one site in 2003 and found no violations of the temperature, pH, or dissolved oxygen criteria. MassDEP DWM collected five total phosphorus samples at one site in 2003 and the concentrations ranged from 0.008 mg/L to 0.028 mg/L.</p> <p style="text-align: right;"><i>Data Sources: 12, 24</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Impaired</b>	
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 315 CFU/100ml. This result violates the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>. MassDEP DWM field sheets recorded observations of very dense aquatic macrophyte growth from June till October 2003.</p> <p><b>Cause(s) of Impairment:</b> <i>E. coli</i>  <b>Source(s) of Impairment:</b> Wet weather discharges (non-point sources), unknown</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		

<b>Secondary Contact</b>	<b>Support</b>	<b>Yes</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 315 CFU/100ml. This result does not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>. MassDEP DWM field sheets recorded observations of very dense aquatic macrophyte growth from June through October 2003. An Alert Status is identified for this use due to the very dense aquatic plant coverage.</p> <p style="text-align: right;"><i>Data Sources: 24, 30</i></p>		
<b>Aesthetics</b>	<b>Support</b>	<b>Yes</b>
<p>MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of algae. There were observations of very dense in-stream aquatic plant coverage from June to October 2003 at the site. An Alert Status is identified for this use due to the very dense aquatic plant coverage.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Recommendations</b>		
<p>Conduct bacteria source tracking to determine the source(s) of elevated bacteria levels within this segment.</p>		

## NORTH NASHUA RIVER (SEGMENT MA81-04)

Location: Leominster WWTP outfall, Leominster, to confluence with Nashua River, Lancaster.

Segment Length: 10.4 Miles

Classification: Class B, WWF

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown, Pathogens, Taste/Odor/Color, Turbidity

NPDES Discharges: City of Leominster (MA0100617), issued September 2006 with authorization to discharge from the Leominster Water Pollution Control Facility 9.3 MGD (average monthly flow) of treated effluent to the North Nashua River. River Terrace Healthcare (MA0025763), issued September 1995 with authorization to discharge 0.006 MGD (average monthly flow) of sanitary wastewater to the Nashua River.

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Support</b>	<b>Yes</b>
<p>MassDEP DWM collected a benthic macroinvertebrate sample at one site in 2003. The RBP III metrics and score indicated that the macroinvertebrate community is slightly impacted by water quality. MA DFG collected fish population samples at two sites in 2002. The samples were diverse and dominated by individuals classified as fluvial specialists/dependants and pollution tolerant. River Terrace Healthcare facility, from September 2000 through September 2007, conducted eight toxicity tests (<i>C. dubia</i> or <i>P. promelas</i>) on ambient river water collected upstream from their discharge as part of their NPDES permit requirements and all toxicity tests had a survival rate above 75 percent after 48 hours. In June of 2002 EPA-NERL collected three water samples at one site for toxicity analysis. The samples were analyzed at the EPA-NERL for 7-day chronic toxicity (<i>C. dubia</i>, <i>P. promelas</i>). Evidence of toxicity at this location was absent on the <i>C. dubia</i> tests and inconclusive on the <i>P. promelas</i> tests. MassDEP DWM in 2003 and MassDEP CERO in 2003 and 2004 measured temperature, pH, and dissolved oxygen a total of 19 times at one site. There were no violations of the temperature or dissolved oxygen standard and two violations of the pH standard. NRWA from 2001 through 2006 measured temperature a total of 87 times and pH a total of 75 times at three sites and found no violations of the temperature standard and four violations of the pH standard. MassDEP DWM in 2003 and MassDEP CERO in 2003 and 2004 collected a total of 12 total phosphorus samples at one site. The concentrations of the samples ranged from 0.054 mg/L to 0.22 mg/L. An Alert Status is identified for this use due to elevated total phosphorus concentrations and low RBP III metrics.</p> <p style="text-align: right;"><i>Data Sources: 4, 12, 26, 1, 24, 25, 15, 16, 17, 18, 19, 20</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Impaired</b>	
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 427 CFU/100ml. NRWA collected a total of 20 <i>Escherichia coli</i> samples at three sites in 2006. The geometric means of the samples collected at each site during the primary contact season ranged from 155 CFU/100ml to 339 CFU/100ml. These results violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>. MassDEP CERO from 2001 through 2004 made aesthetic field observation at one site. Septic or effluent odors were noted in the water column on nearly every visit. The odors impair the Aesthetic Use, which in addition to the <i>Escherichia coli</i> impairs the Primary Contact Use.</p> <p><b>Cause(s) of Impairment:</b> <i>E. coli</i>, taste/odor  <b>Source(s) of Impairment:</b> Wet weather discharges (point source and combination of stormwater, SSO or CSO), unknown</p> <p style="text-align: right;"><i>Data Sources: 24, 20, 29, 30</i></p>		

<b>Secondary Contact</b>	<b>Impaired</b>	
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 427 CFU/100ml. NRWA collected a total of 20 <i>Escherichia coli</i> samples at three sites in 2006. The geometric means at the sites ranged from 155 CFU/100ml to 339 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>. MassDEP CERO from 2001 to 2004 made aesthetic field observations at one site. Septic or effluent odors were noted in the water column on nearly every visit. The odors impair the Aesthetic Use, which in addition to the <i>Escherichia coli</i> impairs the Primary Contact Use.</p> <p><b>Cause(s) of Impairment:</b> Taste/Odor  <b>Source(s) of Impairment:</b> Wet weather discharges (point source and combination of stormwater, SSO or CSO), unknown</p> <p style="text-align: right;"><i>Data Sources: 24, 20, 30</i></p>		
<b>Aesthetics</b>	<b>Impaired</b>	
<p>MassDEP DWM in 2003 and MassDEP CERO from 2001 to 2004 recorded aesthetic field observations at one site. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae. There were observations of septic or effluent odors in the water column on nearly all of the site visits.</p> <p><b>Cause(s) of Impairment:</b> Taste/Odor  <b>Source(s) of Impairment:</b> Municipal point source discharges, unknown</p> <p style="text-align: right;"><i>Data Sources: 29, 24</i></p>		
<b>Recommendations</b>		
<p>Conduct bacteria source tracking to determine the source(s) of elevated bacteria levels within this segment.</p> <p>Continue monitoring total phosphorus concentrations and biological responses to evaluate the effectiveness of the Nashua River Total Phosphorus TMDL implementation.</p>		

### FALL BROOK (SEGMENT MA81-39)

Location: From the outlet of Lake Samoset, Leominster, to the confluence with the North Nashua River, Leominster (formerly part of Segment MA81-14).

Segment Length: 3.0 Miles

Classification: Class B

2006 Integrated List of Waters: Category 3 - No Uses Assessed

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Support</b>	<b>No</b>
<p>MA DFG collected a fish population sample in 2002 at one site. Of the 72 fish collected in the sample, 29 were eastern brook trout (<i>Salvelinus fontinalis</i>) of varying size and six were brown trout of varying size. Both eastern brook trout and brown trout (<i>Salmo Trutta</i>) are cold-water species classified as fluvial specialists and pollution intolerant. The presence of reproducing trout populations indicates excellent water quality. The fisheries data indicates that cold water fishery is an existing use for this segment.</p> <p style="text-align: right;"><i>Data Sources: 12</i></p>		

<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).		
<i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct bacteria sampling to assess the Primary and Secondary Contact Recreational Uses. Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

### **NASHUA RIVER (SEGMENT MA81-05)**

Location: Confluence with North Nashua River, Lancaster, to confluence with Squannacook River, Shirley/Groton/Ayer.

Segment Length: 14.2 Miles

Classification: Class B, WWF

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown, Unknown toxicity, Metals, Nutrients, Pathogens, Taste/Odor/Color, Turbidity

NPDES Discharges: Town of Ayer (MA0100013), issued February 2006 with authorization to discharge from the Ayer Wastewater Treatment Facility 1.79 MGD (average monthly flow) of treated effluent to the Nashua River.

WMA Withdrawals: Massachusetts Development Finance Agency (21101903)

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Support</b>	<b>Yes</b>
<p>MA DFG collected fish population samples at two sites in 2002. Individuals classified as macrohabitat generalist and moderately pollution intolerant dominated the samples. Ayer WWTP facility, from June 2001 through December 2007, conducted 25 toxicity tests (<i>C. dubia</i>) on ambient river water collected upstream from their discharge as part of their NPDES permit requirements and all toxicity tests had a survival rate above 75 percent after 7 days. MassDEP DWM in 2003 and MassDEP CERO from 2001 through 2004 measured temperature, pH, and dissolved oxygen a total of 23 times at two sites. There were no violations of the temperature or dissolved oxygen criteria and two violations of the pH criterion. The pH violations were 6.3 and 6.4. NRWA, from 2001 through 2006, measured temperature a total of 92 times and pH a total of 74 times at five sites and found no violations of the temperature criterion and 12 violations of the pH criterion. The pH violations ranged from 6.1 to 6.4. MassDEP DWM in 2003 and MassDEP CERO from 2001 through 2003 collected a total of 27 total phosphorus samples at three sites. The concentrations of the samples ranged from 0.043 mg/L to 0.21 mg/L. An Alert Status is identified for this use due to elevated total phosphorus concentrations and the dominance of macrohabitat generalist in the fish community.</p>		
<i>Data Sources: 24, 25, 15, 16, 17, 18, 19, 20, 26</i>		

<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Impaired</b>	
<p>MassDEP DWM collected a total of 10 <i>Escherichia coli</i> samples at two sites in 2003. The geometric means of the samples collected at each site during the primary contact season were 258 CFU/100ml and 114 CFU/100ml. NRWA collected a total of 20 <i>Escherichia coli</i> samples at two sites from 2005 through 2006. The annual geometric means of the samples collected at each site during the primary contact season ranged from 30 CFU/100ml to 161 CFU/100ml. These results violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p><b>Cause(s) of Impairment:</b> <i>E. coli</i>  <b>Source(s) of Impairment:</b> Wet weather discharges (non-point sources), unknown</p> <p style="text-align: right;"><i>Data Sources: 24, 19, 20</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>Yes</b>
<p>MassDEP DWM collected a total of 10 <i>Escherichia coli</i> samples at two sites in 2003. The geometric means at the sites were 258 CFU/100ml and 114 CFU/100ml. NRWA collected a total of 20 <i>Escherichia coli</i> samples at two sites from 2005 through 2006. The annual geometric means at the sites ranged from 30 CFU/100ml and 161 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>. An Alert Status is identified for this use due to occasional spikes in <i>Escherichia coli</i> concentrations.</p> <p style="text-align: right;"><i>Data Sources: 24, 19, 20</i></p>		
<b>Aesthetics</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM in 2003 recorded aesthetic field observations at three sites and MassDEP CERO from 2001 through 2003 recorded aesthetic field observations at one site. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Recommendations</b>		
<p>Conduct bacteria source tracking to determine the source(s) of elevated bacteria levels within this segment.</p> <p>Continue monitoring total phosphorus concentrations and biological responses to evaluate the effectiveness of the Nashua River Total Phosphorus TMDL implementation.</p>		

**STILL RIVER (SEGMENT MA81-60)**

Location: Headwaters, Lancaster, to Route 117, Bolton (formerly the upper portion of Segment MA81-15).

Segment Length: 0.6 Miles

Classification: Class B, CWF

2006 Integrated List of Waters: Category 3 - No Uses Assessed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Support</b>	<b>Yes</b>
<p>This segment is classified as a Cold Water Fishery. A MA DFG fish population sample collected in 2002 was dominated by eastern brook trout (<i>Salvelinus fontinalis</i>). Of the 151 individual fish collected 142 or 94 percent were identified as eastern brook trout of varying size classes. Eastern brook trout are a cold-water species classified as fluvial specialists and pollution intolerant. The dominance of a reproducing eastern brook trout population indicates excellent water quality. MassDEP DWM in 2003 measured temperature, pH, and dissolved oxygen five times at one site and found five violations of the dissolved oxygen criterion and one violation of the pH criterion. One of the temperature measurements at 21.9°C was above 20.0°C. The five dissolved oxygen measurements ranged from 0.3 mg/L to 1.0 mg/L but four of the measurements were qualified as unstable. NRWA in 2006 measured temperature a total of seven times and pH a total of six times at one site and found six violations of the pH criterion. Three of the temperature measurements were above 20°C. MassDEP DWM collected a total of five total phosphorus samples in 2003 at one site. The total phosphorus concentrations ranged from 0.041 mg/L to 0.18 mg/L. An Alert Status is identified for this use due to the low dissolved oxygen, elevated temperatures, and high total phosphorus concentrations.</p> <p style="text-align: right;"><i>Data Sources: 12, 24, 20</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Impaired</b>	
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 366 CFU/100ml. This result violates the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p><b>Cause(s) of Impairment:</b> <i>E. coli</i></p> <p><b>Source(s) of Impairment:</b> Wet weather discharges (non-point sources), unknown</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>Yes</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 366 CFU/100ml. This result does not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>. An Alert Status is identified for this use due to occasional spikes in <i>Escherichia coli</i> concentrations.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Aesthetics</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		

Recommendations
Conduct bacteria source tracking to determine the source(s) of elevated bacteria levels within this segment.

### CATACONAMUG BROOK (SEGMENT MA81-16)

Location: Outlet Lake Shirley, Lunenburg, to confluence with Nashua River, Shirley/Harvard.

Segment Length: 3.2 Miles

Classification: Class B

2006 Integrated List of Waters: Category 3 - No Uses Assessed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Support</b>	<b>Yes</b>
<p>MA DFG collected fish population samples at one site in 2003. Individuals classified as macrohabitat generalist and pollution tolerant dominated the sample. MassDEP DWM measured dissolved oxygen, temperature, and pH five times at one site in 2003 and found no violations of the temperature, pH, or dissolved oxygen criteria. MassDEP DWM collected five total phosphorus samples at one site in 2003 and the concentrations ranged from 0.010 mg/L to 0.026 mg/L. NRWA, from 2001 through 2004, measured temperature a total of 67 times and pH a total of 59 times at four sites and found no violations of the temperature criterion and 13 violations of the pH criterion. The pH violations ranged from 6.0 to 6.4. An Alert Status is identified for this use due to the dominance of macrohabitat generalist.</p> <p style="text-align: right;"><i>Data Sources: 12, 24, 15, 16, 17, 18</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 57 CFU/100ml. This result does not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 57 CFU/100ml. This result does not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Aesthetics</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Recommendations</b>		

**NONACOICUS BROOK (SEGMENT MA81-17)**

Location: Outlet Plow Shop Pond, Ayer, to confluence with Nashua River, Ayer/Shirley.

Segment Length: 1.4 Miles

Classification: Class B

2006 Integrated List of Waters: Category 3 - No Uses Assessed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	
<p>MassDEP DWM measured dissolved oxygen, temperature, and pH six times at one site in 2003 and found no violations of the temperature or pH criterion and five violations of the dissolved oxygen criterion. The violations ranged from 1.9 mg/L to 4.6 mg/L.</p> <p><b>Cause(s) of Impairment:</b> Dissolved oxygen  <b>Source(s) of Impairment:</b> Unknown</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 77 CFU/100ml. This result does not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 77 CFU/100ml. This result does not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Aesthetics</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Recommendations</b>		
<p>Deploy dissolved oxygen probes to determine the severity of the impairment. Conduct biological monitoring to determine the impact of the low dissolved oxygen concentrations on the biota. Conduct source tracking to identify the source of the low dissolved oxygen concentrations.</p>		

**MULPUS BROOK (SEGMENT MA81-36)**

Location: Headwaters, north of Howard Street, Lunenburg, to the inlet of Hickory Hills Lake, Lunenburg (formerly part of Segment MA81-22).

Segment Length: 3.8 Miles

Classification: Class B, CWF

2006 Integrated List of Waters: Category 3 - No Uses Assessed

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>Yes</b>
<p>This segment is classified as a Cold Water Fishery. Insufficient data were available to assess the Aquatic Life Use. MA DFG collected a fish population sample in 2002 at one site. None of the four species collected in the sample are classified as cold-water species. Insufficient data were available to assess the Aquatic Life Use. An Alert Status is identified for this use due to a lack of cold-water species.</p> <p style="text-align: right;"><i>Data Sources: 12</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
<p>No data were available to assess the primary contact use.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
<p>No data were available to assess the primary contact use.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
<p>No data were available to assess the Aesthetic Use.</p>		
<b>Recommendations</b>		
<p>Conduct bacteria sampling to assess the Primary and Secondary Contact Recreational Uses.</p> <p>Conduct water quality and biological monitoring to assess the Aquatic Life Use.</p>		

**MULPUS BROOK (SEGMENT MA81-37)**

Location: From the outlet of Hickory Hills Lake, Lunenburg, to the confluence with the Nashua River, Shirley (formerly part of Segment MA81-22).

Segment Length: 6.3 Miles

Classification: Class B, CWF

2006 Integrated List of Waters: Category 3 - No Uses Assessed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	
<p>This segment is classified as a Cold Water Fishery. MA DFG collected a fish population sample in 2002 and 2003 at two different sites. None of the nine species collected in the two samples are classified as cold-water species. MassDEP DWM measured dissolved oxygen, temperature, and pH five times at one site in 2003 and found no violations of the dissolved oxygen or pH criterion. Three of the temperature measurements, including a measurement of 23.1 degrees Celsius at 4:13 AM, were above 20.0°C. Between 2005 and 2006 NRWA measured temperature and pH a total of 14 times at one site and found two violations of the pH criterion. Two of the temperature measurements were above 20.0°C.</p> <p><b>Cause(s) of Impairment:</b> Lack of a coldwater assemblage  <b>Source(s) of Impairment:</b> Dam and impoundment, unknown</p> <p style="text-align: right;"><i>Data Sources: 12, 19, 20, 24</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 38 CFU/100ml. NRWA collected a total of 13 <i>Escherichia coli</i> samples at one site from 2005 through 2006. The annual geometric means of the samples collected during the primary contact season were 31 CFU/100ml and 46 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 38 CFU/100ml. NRWA collected a total of 13 <i>Escherichia coli</i> samples at one site from 2005 through 2006. The annual geometric means were 31 CFU/100ml and 46 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Aesthetics</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
<b>Recommendations</b>		
<p>Conduct extensive fish community monitoring to confirm the lack of a cold water assemblage. Conduct monitoring to determine the stressors impacting the fish community.</p>		

**SQUANNACOOK RIVER (SEGMENT MA81-18)**

Location: Confluence Mason and Willard brooks, Townsend, to Hollingsworth and Vose Dam, Groton/Shirley (thru Harbor Pond formerly Segment MA81054).

Segment Length: 12.6 Miles

Classification: Class B, CWF

2006 Integrated List of Waters: Category 2 - Attaining Some Uses: Other Uses Not Assessed - Uses

Attained: Aquatic Life, Primary Contact, Secondary Contact, Aesthetics

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	
<p>This segment is classified as a Cold Water Fishery. MA DFG collected fish population samples in 2003 at two sites. One of the 14 species (2 of the 337 individuals) collected in the two samples is classified as a cold water species. Hollingsworth &amp; Vose Company, from February 2000 to September 2007, conducted 32 toxicity tests (<i>C. dubia</i>) on ambient river water collected upstream from their discharge as part of their NPDES permit requirements and none of the tests had a survival rate below 75 percent after 7 days. In early August of 2003 MassDEP DWM deployed temperature probes at three sites for 42 days. A total of 36 7-day rolling averages of daily maximum temperature could be calculated from the available data. The number of 7-day rolling averages at the three sites that exceeded the cold water temperature criterion ranged from 18 to 29. MassDEP DWM in 2003 and MassDEP CERO from 2001 to 2004 measured dissolved oxygen, temperature, and pH a total of 22 times at one site and found no violations of the dissolved oxygen criterion and 13 violations of the pH criterion. The violations of the pH criterion ranged from 5.9 to 6.4. Six of the temperature measurements, including a measurement of 23.2 C at 3:19 AM, were above 20 C. NRWA from 2001 to 2006 measured temperature a total of 93 times and pH a total of 83 times at nine sites and found 31 violations of the pH criterion. The violations of the pH criterion ranged from 5.8 to 6.4. Of the 93 temperature measurements, 13 were above 20 C.</p> <p><b>Cause(s) of Impairment:</b> Lack of a coldwater assemblage, temperature, low pH  <b>Source(s) of Impairment:</b> Dam and impoundment, unknown  <i>Data Sources: 12, 27, 26, 24, 25, 15, 16, 17, 18, 19, 20</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Impaired</b>	
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 74 CFU/100ml. NRWA collected a total of 36 <i>Escherichia coli</i> samples at three sites from 2005 through 2006. The annual geometric means of the samples collected at each site during the primary contact season ranged from 16 CFU/100ml to 141 CFU/100ml. These results violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>. The data indicates that the use impairment may be temporary and local to a portion of the segment between the Mason Road bridge and South Street bridge in Townsend. The data indicates that the remaining portions of the segment support Primary Contact Use.</p> <p><b>Cause(s) of Impairment:</b> <i>E. coli</i>  <b>Source(s) of Impairment:</b> Wet weather discharges (non-point sources), unknown  <i>Data Sources: 24, 19, 20</i></p>		

Secondary Contact	Support	No
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 74 CFU/100ml. NRWA collected a total of 36 <i>Escherichia coli</i> samples at three sites from 2005 through 2006. The annual geometric means at the sites ranged from 16 CFU/100ml to 141 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24, 19, 20</i></p>		
Aesthetics	Support	No
<p>MassDEP DWM recorded aesthetic field observations at one site in 2003 and MassDEP CERO from 2001 through 2004 recorded aesthetic field observations at two sites. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.</p> <p style="text-align: right;"><i>Data Sources: 24, 25</i></p>		
Recommendations		
<p>Conduct bacteria source tracking to determine the source(s) of elevated bacteria levels within this segment.</p> <p>Conduct extensive fish community monitoring to confirm the lack of a cold water assemblage. Conduct monitoring to determine the stressors impacting the fish community.</p>		

### SQUANNACOOK RIVER (SEGMENT MA81-19)

Location: Hollingsworth and Vose Dam, Groton/Shirley, to confluence with Nashua River, Shirley/Groton/Ayer.

Segment Length: 3.7 Miles

Classification: Class B, WWF

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown

NPDES Discharges: Hollingsworth & Vose Company (MA0004561), issued January 2004 with authorization to discharge treated effluent from their facility in West Groton to the Squannacook River.

WMA Withdrawals: Hollingsworth & Vose Company (21111502)

Designated Use	Use Assessment	Alert
Aquatic Life	Support	Yes
<p>MA DFG collected a fish population sample at one site in 2003. Individuals classified as macrohabitat generalist and moderately pollution intolerant dominated the sample. MassDEP DWM measured dissolved oxygen, temperature, and pH four times at one site in 2003 and found no violations of the temperature, pH, or dissolved oxygen criteria. MassDEP DWM collected five total phosphorus samples at one site in 2003 and the concentrations ranged from 0.008 mg/L to 0.031 mg/L. NRWA, from 2003 through 2006, measured temperature a total of 24 times and pH a total of 20 times at four sites and found no violations of the temperature criterion and seven violations of the pH criterion. The pH violations ranged from 5.8 to 6.4. An Alert Status is identified for this use due to the dominance of macrohabitat generalist and low pH.</p> <p style="text-align: right;"><i>Data Sources: 12, 24</i></p>		
Fish Consumption	Not Assessed	No
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		

Primary Contact	Support	No
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 28 CFU/100ml. NRWA collected a total of 12 <i>Escherichia coli</i> samples at one site from 2005 through 2006. The annual geometric means of the samples collected during the primary contact season were 35 CFU/100ml and 37 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24, 19, 20</i></p>		
Secondary Contact	Support	No
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 28 CFU/100ml. NRWA collected a total of 12 <i>Escherichia coli</i> samples at one site from 2005 through 2006. The annual geometric means were 35 CFU/100ml and 37 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24, 19, 20</i></p>		
Aesthetics	Support	No
<p>MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
Recommendations		

## NASHUA RIVER (SEGMENT MA81-06)

Location: Confluence with Squannacook River, Shirley/Groton/Ayer, to Pepperell Dam, Pepperell (thru Pepperell Pond formerly Segment MA81167).

Segment Length: 9.1 Miles

Classification: Class B, WWF

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown, Metals, Nutrients, Organic enrichment/Low DO, Noxious aquatic plants, Turbidity

NPDES Discharges: The Groton School (MA0033324), issued September 2007 with authorization to discharge from the Groton School Wastewater Treatment Plant 0.07 MGD (average monthly flow) of treated effluent to the Nashua River.

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
Aquatic Life	Impaired	
<p>Pepperell Pond is part of this river segment for assessment purposes. Three non-native aquatic macrophyte species (<i>Cabomba caroliniana</i>, <i>Trapa natans</i>, <i>Potamogeton crispus</i>) have been observed in Pepperell Pond. MA DFG collected fish population samples at four sites in 2003. Three of the fish sites were collected in Pepperell Pond. Individuals classified as macrohabitat generalist dominated all of the fish samples. Individuals classified as pollutant tolerant dominated two of the sites, both collected in Pepperell Pond. Groton School, from April 2000 through September 2007, conducted 15 toxicity tests (<i>C. dubia</i> (n=15), <i>P. promelas</i> (n=6), <i>D. pulex</i> (n=6)) on ambient river water collected upstream from their discharge as part of their NPDES permit requirements and none of the tests had a survival rate below 75 percent after 48 hours. Indeck Pepperell Power Associates, Inc., from May 2000 through May 2005, conducted five toxicity tests (<i>C. dubia</i>, <i>P. promelas</i>) on ambient river water collected above Pepperell Dam and their discharge as part of their NPDES permit requirements and all toxicity tests had a survival rate above 75 percent after 48 hours. SBGI Corp, from February 2000 through May 2002, conducted 10 toxicity tests (<i>C. dubia</i>, <i>P. promelas</i>) on ambient river water collected above Pepperell Dam and their discharge as part of their NPDES permit requirements and all toxicity tests had a survival rate above 75 percent after 48 hours. MassDEP DWM measured dissolved oxygen, temperature, and pH three times at Pepperell Pond and five times at one river site near the Pepperell Pond inlet in 2003 and found no violations of the dissolved oxygen, temperature or pH criteria. NRWA from 2003 to 2006 measured temperature and pH a total of 38 times at two sites, one in Pepperell Pond and one at the inlet of Pepperell Pond, and found no violations of the temperature criterion and one violation of the pH criterion. In August of 2004 EPA deployed multiprobes at two sites for five days to continuously measure dissolved oxygen, temperature, and pH. No violations of the dissolved oxygen, temperature, or pH criteria were observed during the deployment. MassDEP DWM in 2003 and SMART in 2004 collected a total of 19 total phosphorus samples and the concentrations ranged from 0.030 mg/L to 0.087 mg/L. The Aquatic Life Use impairments in this segment appear limited to Pepperell Pond. The available data indicates that the portion of the segment upstream of Pepperell Pond supports the Aquatic Life Use.</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants, nutrient/eutrophication biological indicators <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional), municipal point source discharges, unknown</p> <p style="text-align: right;"><i>Data Sources: 10, 28, 12, 26, 24, 17, 18, 19, 20, 31</i></p>		

Fish Consumption	Impaired	
<p>Pepperell Pond is part of this river segment for assessment purposes. MA DPH has issued a fish consumption advisory due to mercury contamination for Pepperell Pond. Children under 12, pregnant women, women of childbearing age who may become pregnant and nursing mothers should refrain from consuming any fish from Pepperell Pond in order to prevent exposure to developing fetuses, nursing infants and young children to mercury. The general public should refrain from consuming largemouth bass fish from Pepperell Pond. The general public should limit the consumption of non-affected fish from Pepperell Pond to two meals per month. The Fish Consumption Use impairments in this segment are limited to Pepperell Pond. There is insufficient data to assess the Fish Consumption Use in the portion of the segment upstream from Pepperell Pond.</p> <p><b>Cause(s) of Impairment:</b> Mercury in fish tissue  <b>Source(s) of Impairment:</b> Atmospheric deposition - toxics, unknown</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
Primary Contact	Impaired	
<p>Pepperell Pond is part of this river segment for assessment purposes. MassDEP DWM collected five <i>Escherichia coli</i> samples at one site near the Pepperell Pond inlet in 2003. The geometric mean of the samples collected during the primary contact season was 35 CFU/100ml. NRWA collected a total of 25 <i>Escherichia coli</i> samples at two sites, one in Pepperell Pond and one at the inlet of Pepperell Pond, from 2005 through 2006. The annual geometric means of the samples collected at each site during the primary contact season ranged from 17 CFU/100ml to 65 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>. MassDEP DWM conducted an aquatic macrophyte survey of Pepperell Pond in 2003 and found very dense (75-100%) macrophyte coverage over much of the pond. The non-native <i>Trapa natans</i> was the dominant species. The dense macrophyte coverage impairs the Aesthetic Use, which in turn impairs Primary Contact. The Primary Contact Use impairments in this segment are limited to Pepperell Pond. The bacteria and aesthetics data indicate that the portion of the segment upstream of Pepperell Pond supports the Primary Contact Use.</p> <p><b>Cause(s) of Impairment:</b> Aquatic plants (macrophytes), non-native aquatic plants, nutrient/eutrophication biological indicators  <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or Intentional), municipal point source discharges, unknown</p> <p style="text-align: right;"><i>Data Sources: 24, 19, 20, 28</i></p>		
Secondary Contact	Impaired	
<p>Pepperell Pond is part of this river segment for assessment purposes. MassDEP DWM collected five <i>Escherichia coli</i> samples at one site near the Pepperell Pond inlet in 2003. The geometric mean of the samples collected during the primary contact season was 35 CFU/100ml. NRWA collected a total of 25 <i>Escherichia coli</i> samples at two sites, one in Pepperell Pond and one at the inlet of Pepperell Pond, from 2005 through 2006. The annual geometric means of the samples collected at each site during the primary contact season ranged from 17 CFU/100ml to 65 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>. MassDEP DWM conducted an aquatic macrophyte survey of Pepperell Pond in 2003 and found very dense (75-100%) macrophyte coverage over much of the pond. The non-native <i>Trapa natans</i> was the dominant species. The dense macrophyte coverage impairs the Aesthetic Use, which in turn impairs Primary Contact. The Primary Contact Use impairments in this segment are limited to Pepperell Pond. The bacteria and aesthetics data indicate that the portion of the segment upstream of Pepperell Pond supports the Primary Contact Use.</p> <p><b>Cause(s) of Impairment:</b> Aquatic plants (macrophytes), non-native aquatic plants, nutrient/eutrophication biological indicators  <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or Intentional), municipal point source discharges, unknown</p> <p style="text-align: right;"><i>Data Sources: 24, 19, 20, 28</i></p>		

Aesthetics	Impaired	
<p>Pepperell Pond is part of this river segment for assessment purposes. MassDEP DWM in 2003 and MassDEP CERO from 2001 to 2004 recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable turbidity, odor or color, floating scum, or overabundant growths of aquatic plants or algae. There were observations of trash during the majority of the MassDEP CERO site visits. MassDEP DWM conducted an aquatic plant survey of Pepperell Pond in 2003 and found very dense (75%-100%) areal coverage. The Aesthetic Use impairments in this segment are limited to Pepperell Pond. The aesthetic field observations indicate that the portion of the segment upstream from Pepperell Pond supports the Aesthetic Use.</p> <p><b>Cause(s) of Impairment:</b> Aquatic plants (macrophytes), non-native aquatic plants, nutrient/eutrophication biological indicators</p> <p><b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or Intentional), municipal point source discharges, unknown</p> <p style="text-align: right;"><i>Data Sources: 28, 29, 24</i></p>		
Recommendations		
<p>Continue monitoring total phosphorus concentrations and biological responses to evaluate the effectiveness of the Nashua River Total Phosphorus TMDL implementation.</p> <p>Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.</p>		

### JAMES BROOK (SEGMENT MA81-20)

Location: Headwaters, Groton, to confluence with Nashua River, Ayer/Groton.

Segment Length: 3.9 Miles

Classification: Class B

2006 Integrated List of Waters: Category 3 - No Uses Assessed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Support</b>	<b>Yes</b>
<p>MassDEP DWM measured dissolved oxygen, temperature, and pH four times at one site in 2003 and found no violations of the temperature, pH, or dissolved oxygen criteria. MassDEP DWM collected five total phosphorus samples at one site in 2003 and the concentrations ranged from 0.011 mg/L to 0.064 mg/L. NRWA measured temperature and pH a total of 10 times at two different sites in 2001 and 2003 and found no violations of the temperature criterion and five violations of the pH criterion. The pH violations ranged from 5.9 to 6.1. An Alert Status is identified for this use due to low pH.</p> <p style="text-align: right;"><i>Data Sources: 24, 15, 17</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 83 CFU/100ml. This result does not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		

Secondary Contact	Support	No
MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 83 CFU/100ml. This result does not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> .		
Data Sources: 24		
Aesthetics	Support	No
MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.		
Data Sources: 24		
Recommendations		

### NASHUA RIVER (SEGMENT MA81-07)

Location: Pepperell Dam, Pepperell, to New Hampshire state line, Pepperell/Dunstable.

Segment Length: 3.7 Miles

Classification: Class B, WWF

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL -Cause Unknown, Nutrients, Pathogens, Turbidity

NPDES Discharges: Town of Pepperell (MA0100064), issued November 2005 with authorization to discharge from the Pepperell Wastewater Treatment Plant 1.1 MGD (average monthly flow) of treated effluent to the Nashua River.

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
Aquatic Life	Support	Yes
Pepperell WWTP facility, from May 2000 through June 2007, conducted 13 toxicity tests ( <i>C. dubia</i> ) on ambient river water collected upstream from their discharge as part of their NPDES permit requirements and all toxicity tests had a survival rate above 75 percent after 48 hours. MassDEP DWM in 2003 and MassDEP CERO from 2001 through 2004 measured temperature, pH, and dissolved oxygen a total of 25 times at one sites. There were no violations of the temperature or dissolved oxygen criteria and two violations of the pH criterion. NRWA, from 2001 through 2006, measured temperature a total of 53 times and pH a total of 48 times at two sites and found no violations of the temperature criterion and four violations of the pH criterion. The pH violations ranged from 6.1 to 6.4. MassDEP DWM in 2003 and SMART from 2001 through 2003 collected a total of 25 total phosphorus samples at one site. The concentrations of the samples ranged from 0.010 mg/L to 0.21 mg/L. An Alert Status is identified for this use due to elevated total phosphorus concentrations.		
Data Sources: 24, 25, 26		
Fish Consumption	Not Assessed	No
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).		
Data Sources: 13		

Primary Contact	Support	Yes
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 61 CFU/100ml. NRWA collected a total of 20 <i>Escherichia coli</i> samples at one site from 2004 through 2006. The annual geometric means of the samples collected during the primary contact season ranged from 3 CFU/100ml to 118 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>. An Alert Status is identified for this use due to occasional spikes in <i>Escherichia coli</i> concentrations.</p> <p style="text-align: right;"><i>Data Sources: 24, 18, 19, 20</i></p>		
Secondary Contact	Support	No
<p>MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 61 CFU/100ml. NRWA collected a total of 20 <i>Escherichia coli</i> samples at one site from 2004 through 2006. The annual geometric mean ranged from 3 CFU/100ml to 118 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i>.</p> <p style="text-align: right;"><i>Data Sources: 24, 18, 19, 20</i></p>		
Aesthetics	Support	Yes
<p>MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae. An Alert Status is identified for this segment due to observations of moderate filamentous algae cover on three of the five surveys.</p> <p style="text-align: right;"><i>Data Sources: 24</i></p>		
Recommendations		
<p>Continue monitoring total phosphorus concentrations and biological responses to evaluate the effectiveness of the Nashua River Total Phosphorus TMDL implementation.</p>		

### NISSITISSIT RIVER (SEGMENT MA81-21)

Location: New Hampshire state line, Pepperell, to confluence with Nashua River, Pepperell.

Segment Length: 4.6 Miles

Classification: Class B, CWF

2006 Integrated List of Waters: Category 5 - Waters requiring a TMDL - Cause Unknown

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
Aquatic Life	Impaired	
<p>This segment is classified as a Cold Water Fishery. MA DFG collected fish population samples at three sites in 2003. One of the 16 species (1 of the 391 individuals) collected in the three samples is classified as a cold water species. MassDEP DWM measured dissolved oxygen, temperature, and pH four times at one site in 2003 and found no violations of the dissolved oxygen or pH criterion. Three of the temperature measurements, including a measurement of 24.7 degrees Celsius at 2:41 AM, were above 20.0°C. Between 2005 and 2006 NRWA measured temperature a total of 83 times and pH a total of 68 times at three sites and found eight violations of the pH criterion. Twenty of the temperature measurements were above 20.0°C.</p> <p><b>Cause(s) of Impairment:</b> Lack of a coldwater assemblage  <b>Source(s) of Impairment:</b> Unknown</p> <p style="text-align: right;"><i>Data Sources: 12, 24, 19, 20</i></p>		

<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).		
<i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>Yes</b>
MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean of the samples collected during the primary contact season was 52 CFU/100ml. NRWA collected a total of 28 <i>Escherichia coli</i> samples at two sites from 2005 through 2006. The annual geometric means of the samples collected at each site during the primary contact season ranged from 2 CFU/100ml to 93 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> . The geometric mean of <i>Escherichia coli</i> samples collected by NRWA in 2004 exceeded the primary contact criterion. However, the exceedances were not observed in the years before or after 2004. An Alert Status is identified for this use due to historical evidence of elevated <i>Escherichia coli</i> concentrations.		
<i>Data Sources: 24, 18, 19, 20</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
MassDEP DWM collected five <i>Escherichia coli</i> samples at one site in 2003. The geometric mean was 52 CFU/100ml. NRWA collected a total of 28 <i>Escherichia coli</i> samples at two sites from 2005 through 2006. The annual geometric means at the sites ranged from 2 CFU/100ml and 93 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> .		
<i>Data Sources: 24, 18, 19, 20</i>		
<b>Aesthetics</b>	<b>Support</b>	<b>No</b>
MassDEP DWM recorded aesthetic field observations at one site in 2003. There were no field observations indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae.		
<i>Data Sources: 24</i>		
<b>Recommendations</b>		
Conduct extensive fish community monitoring to confirm the lack of a cold-water assemblage. Conduct monitoring to determine the stressors impacting the fish community.		

### SUCKER BROOK (SEGMENT MA81-23)

Location: Outlet Coon Tree Pond, Pepperell, to confluence with Nissitissit River, Pepperell.

Segment Length: 4.0 Miles

Classification: Class B

2006 Integrated List of Waters: Category 3 - No Uses Assessed

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
MA DFG collected fish population samples at one site in 2003. Individuals classified as macrohabitat generalists and pollution tolerant dominated the sample. NRWA, from 2001 through 2006, measured temperature and pH a total of 35 times at two sites and found no violations of the temperature or pH criteria. Insufficient data were available to assess the Aquatic Life Use.		
<i>Data Sources: 12, 15, 19, 20</i>		

<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).		
<i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
NRWA collected a total of 27 <i>Escherichia coli</i> samples at two sites from 2005 through 2006. The annual geometric means of the samples collected at each site during the primary contact season ranged from 5 CFU/100ml to 59 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i> .		
<i>Data Sources: 19, 20</i>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
NRWA collected a total of 27 <i>Escherichia coli</i> samples at two sites from 2005 through 2006. The annual geometric means at the sites ranged from 5 CFU/100ml to 59 CFU/100ml. These results do not violate the geometric mean criterion (630 CFU/100ml) for <i>Escherichia coli</i> .		
<i>Data Sources: 19, 20</i>		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality and biological monitoring to assess the Aquatic Life Use.		

### BARE HILL POND (SEGMENT MA81007)

Location: Harvard

Segment Area: 311.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 5 - Waters Requiring a TMDL -Metals (See Special Note 2), Noxious aquatic plants [11/2/1999-CN014.0], (Exotic species\*) \*denotes a non-pollutant.

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
Two non-native species ( <i>Trapa natans</i> , <i>Myriophyllum heterophyllum</i> ) have been observed in Bare Hill Pond.		
<b>Cause(s) of Impairment:</b> Non-native aquatic plants		
<b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional)		
<i>Data Sources: 22</i>		
<b>Fish Consumption</b>	<b>Impaired</b>	<b>No</b>
MA DPH has issued a fish consumption advisory due to mercury contamination for Bare Hill Pond. Children under 12, pregnant women, women of childbearing age who may become pregnant and nursing mothers should refrain from consuming largemouth bass fish in order to prevent exposure to developing fetuses, nursing infants and young children to mercury. The general public should limit the consumption of Largemouth fish to two meals per month.		
<b>Cause(s) of Impairment:</b> Mercury in fish tissue		
<b>Source(s) of Impairment:</b> Atmospheric deposition - toxics, unknown		
<i>Data Sources: 13</i>		

<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.		
Conduct water quality monitoring to assess Primary and Secondary Recreational Use.		

### CHAFFIN POND (SEGMENT MA81017)

Location: Holden

Segment Area: 90.0 Acres

Classification: Class A, PWS

2006 Integrated List of Waters: Category 4c - Impairment not Caused by a pollutant -Exotic species

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
A non-native species ( <i>Cabomba caroliniana</i> ) has been observed in Chaffin Pond. <b>Cause(s) of Impairment:</b> Non-native aquatic plants <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional) <i>Data Sources: 22</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.		
Conduct water quality monitoring to assess Primary and Secondary Recreational Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**DAWSON POND (SEGMENT MA81028)**

Location: Holden

Segment Area: 22.0 Acres

Classification: Class A, PWS

2006 Integrated List of Waters: Category 4c - Impairment not Caused by a pollutant -Exotic species

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
Two non-native species ( <i>Cabomba caroliniana</i> , <i>Myriophyllum heterophyllum</i> ) have been observed in Dawson Pond. <b>Cause(s) of Impairment:</b> Non-native aquatic plants <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional) <i>Data Sources: 22</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants. Conduct water quality monitoring to assess Primary and Secondary Recreational Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**EAGLE LAKE (SEGMENT MA81034)**

Location: Holden

Segment Area: 56.0 Acres

Classification: Class A, PWS

2006 Integrated List of Waters: Category 4c - Impairment not Caused by a pollutant -Exotic species

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
A non-native species ( <i>Myriophyllum heterophyllum</i> ) has been observed in Eagle Lake. <b>Cause(s) of Impairment:</b> Non-native aquatic plants <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional) <i>Data Sources: 22, 30</i>		

<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).		
<i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.		
Conduct water quality monitoring to assess Primary and Secondary Recreational Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

#### **FLANNAGAN POND (SEGMENT MA81044)**

Location: Ayer

Segment Area: 80.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 4c - Impairment not Caused by a pollutant -Exotic species

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
Three non-native species ( <i>Potamogeton crispus</i> , <i>Cabomba caroliniana</i> , <i>Myriophyllum heterophyllum</i> ) have been observed in Flannagan Pond.		
<b>Cause(s) of Impairment:</b> Non-native aquatic plants		
<b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional)		
<i>Data Sources: 22, 30</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).		
<i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		

<b>Recommendations</b>
Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.
Conduct water quality monitoring to assess Primary and Secondary Recreational Use.

### **FORT POND (SEGMENT MA81046)**

Location: Lancaster

Segment Area: 76.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 5 - Waters Requiring a TMDL -Nutrients

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
<p>In September of 2003 MassDEP DWM measured dissolved oxygen, temperature, and pH profiles and collected water quality samples at the deepest hole in Fort Pond. The dissolved oxygen concentration was below 5.0 mg/L between 8.0 meters deep and the lake bottom (11.0 meters). The surface area of the exceedances in the hypolimnetic area is greater than 10 percent of the surface area.</p> <p><b>Cause(s) of Impairment:</b> Dissolved oxygen  <b>Source(s) of Impairment:</b> Unknown</p> <p style="text-align: right;"><i>Data Sources: 28</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
Insufficient data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
<p>Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.</p> <p>Conduct water quality monitoring to assess Primary and Secondary Recreational Use.</p>		

## GROVE POND (SEGMENT MA81053)

Location: Ayer

Segment Area: 67.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 5 - Waters Requiring a TMDL -Metals (See Special Note 2),

Noxious aquatic plants, (Exotic species\*) \*denotes a non-pollutant.

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
<p>Three non-native species (<i>Potamogeton crispus</i>, <i>Cabomba caroliniana</i>, <i>Myriophyllum heterophyllum</i>) have been observed in Grove Pond. Garrett Fleming, Inc. completed an ecological risk assessment of Grove Pond in 2006 using the sediment, soils, surface water, biota, benthic invertebrates, fish, frog tissue, swallow tissue, and toxicity data collected to date. The risk assessment indicated an unacceptable risk to benthic invertebrates due to metals in the sediment.</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants, sediment bioassays - chronic toxicity  <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional), contaminated sediments, contaminated groundwater, unknown</p> <p style="text-align: right;"><i>Data Sources: 2, 10, 22</i></p>		
<b>Fish Consumption</b>	<b>Impaired</b>	<b>No</b>
<p>MA DPH has issued a fish consumption advisory due to mercury contamination for Grove Pond. The general public should refrain from consuming any fish species.</p> <p><b>Cause(s) of Impairment:</b> Mercury in fish tissue  <b>Source(s) of Impairment:</b> Atmospheric deposition - toxics, unknown</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Impaired</b>	<b>No</b>
<p>Gannett Fleming, Inc. conducted a Human Health Risk Assessment (HHRA) for Grove Pond as part of an expanded site investigation of Fort Devens, a Superfund National Priority List site. The HHRA found that the carcinogenic risk threshold 1 E-4 was equaled for the recreational adult and recreational child receptors. The carcinogenic risk drivers included arsenic (surface water and sediment), PAHs (sediment), and phthalates (surface water). The non-cancer Hazard Index (HI) risk threshold of 1 was exceeded for the recreational adult and recreational child. The noncarcinogenic risk drivers included arsenic (sediment) and manganese (surface water). The dense macrophyte coverage impairs the Aesthetic Use, which in turn also impairs Primary Contact.</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants, aquatic plants (macrophytes), arsenic, PAH, DEHP (Di-sec-octyl phthalate)  <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional), contaminated sediments, contaminated groundwater, unknown</p> <p style="text-align: right;"><i>Data Sources: 2</i></p>		

Secondary Contact	Impaired	No
<p>Gannett Fleming, Inc. conducted a Human Health Risk Assessment (HHRA) for Grove Pond as part of an expanded site investigation of Fort Devens, a Superfund National Priority List site. The HHRA found that the carcinogenic risk threshold 1 E-4 was equaled for the recreational adult and recreational child receptors. The carcinogenic risk drivers included arsenic (surface water and sediment), PAHs (sediment), and phthalates (surface water). The non-cancer Hazard Index (HI) risk threshold of 1 was exceeded for the recreational adult and recreational child. The noncarcinogenic risk drivers included arsenic (sediment) and manganese (surface water). The dense macrophyte coverage impairs the Aesthetic Use, which in turn also impairs Secondary Contact.</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants, aquatic plants (macrophytes), arsenic, PAH, DEHP (Di-sec-octyl phthalate)</p> <p><b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional), contaminated sediments, contaminated groundwater, unknown</p> <p style="text-align: right;"><i>Data Sources: 2</i></p>		
Aesthetics	Impaired	No
<p>Aquatic macrophytes and emergent wetland plants seasonally cover most of Grove Ponds surface area.</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants, aquatic plants (macrophytes)</p> <p><b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional), unknown</p> <p style="text-align: right;"><i>Data Sources: 2</i></p>		
Recommendations		

### HICKORY HILLS LAKE (SEGMENT MA81031)

Location: Lunenburg

Segment Area: 310.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 5 - Waters Requiring a TMDL -Metals (See Special Note 2)

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
Aquatic Life	Not Assessed	No
No data were available to assess the Aquatic Life Use.		
Fish Consumption	Impaired	No
<p>MA DPH has issued a fish consumption advisory due to mercury contamination for Hickory Hills Lake. Children under 12, pregnant women, women of childbearing age who may become pregnant and nursing mothers should refrain from consuming any fish in order to prevent exposure to developing fetuses, nursing infants and young children to mercury. The general public should limit consumption of all fish species to two meals per month.</p> <p><b>Cause(s) of Impairment:</b> Mercury in fish tissue</p> <p><b>Source(s) of Impairment:</b> Atmospheric deposition - toxics, unknown</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
Primary Contact	Not Assessed	No
No data were available to assess the Primary Contact Use.		
Secondary Contact	Not Assessed	No
No data were available to assess the Secondary Contact Use.		

<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality monitoring to assess the Aquatic Life and Primary and Secondary Contact Recreational Uses.		

### LAKE SAMOSET (SEGMENT MA81116)

Location: Leominster

Segment Area: 35.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 4c - Impairment not Caused by a pollutant Exotic species

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
A non-native species ( <i>Myriophyllum heterophyllum</i> ) has been observed in Lake Samoset. <b>Cause(s) of Impairment:</b> Non-native aquatic plants <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional) <i>Data Sources: 22, 30</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants. Conduct water quality monitoring to assess Primary and Secondary Recreational Use.		

**LAKE SHIRLEY (SEGMENT MA81122)**

Location: Lunenburg

Segment Area: 360.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 5 - Waters Requiring a TMDL -Noxious aquatic plants, Turbidity, ( Exotic species\*) \* denotes a non-pollutant.

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
<p>Three non-native species (<i>Myriophyllum spicatum</i>, <i>Myriophyllum heterophyllum</i>, <i>Cabomba caroliniana</i>, <i>Najas minor</i>) have been observed in Lake Shirley. In September of 2003 MassDEP DWM measured dissolved oxygen, temperature, and pH profiles and collected water quality samples at the deep hole in Lake Shirley. The dissolved oxygen was below 5.0 mg/L and ranged from 1.0 mg/L to 0.2 mg/L between 4.5 meters and the lake bottom (11.1 meters). In July of 2005 and August of 2006 Geosyntec measured dissolved oxygen, temperature, and pH profiles at the deep hole in Lake Shirley. The dissolved oxygen was below 5.0 mg/L and ranged from 1.2 mg/L to 0.7 mg/L between 2.5 meters and the lake bottom (9.0 meters).</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants, eurasian milfoil, dissolved oxygen  <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional), unknown  <i>Data Sources: 3, 22, 28</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
<p>Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.</p> <p>Conduct water quality monitoring to assess Primary and Secondary Recreational Use.</p>		

**LAKE WAMPANOAG (SEGMENT MA81151)**

Location: Ashburnham/Gardner

Segment Area: 224.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 5 - Waters Requiring a TMDL -Metals (See Special Note 2)

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aquatic Life Use.		
<b>Fish Consumption</b>	<b>Impaired</b>	<b>No</b>
MA DPH has issued a fish consumption advisory due to mercury contamination for Lake Wampanoag. The general public should limit consumption of all fish species to two meals per month. <b>Cause(s) of Impairment:</b> Mercury in fish tissue <b>Source(s) of Impairment:</b> Atmospheric deposition - toxics, unknown <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Conduct water quality monitoring to assess the Aquatic Life and Primary and Secondary Contact Recreational Uses.		

**LAKE WHALOM (SEGMENT MA81154)**

Location: Lunenburg

Segment Area: 96.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 4c - Impairment not Caused by a pollutant -Exotic species

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
Three non-native species ( <i>Myriophyllum heterophyllum</i> , <i>Myriophyllum spicatum</i> , <i>Potamogeton crispus</i> ) have been observed in Lake Whalom. <b>Cause(s) of Impairment:</b> Non-native aquatic plants, eurasian milfoil <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional) <i>Data Sources: 22</i>		

<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).		
<i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.		
Conduct water quality monitoring to assess Primary and Secondary Recreational Use.		

### MIRROR LAKE (SEGMENT MA81085)

Location: Harvard

Segment Area: 28.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 5 - Waters Requiring a TMDL -Metals (See Special Note 2)

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aquatic Life Use.		
<b>Fish Consumption</b>	<b>Impaired</b>	<b>No</b>
MA DPH has issued a fish consumption advisory due to mercury contamination for Mirror Lake. Children younger than 12 years of age, pregnant women, women of childbearing age who may become pregnant, and nursing mothers should not eat any largemouth bass fish from this water body. The general public should limit consumption of largemouth bass fish to two meals per month.		
<b>Cause(s) of Impairment:</b> Mercury in fish tissue		
<b>Source(s) of Impairment:</b> Atmospheric deposition - toxics, unknown		
<i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		

Recommendations
Conduct water quality monitoring to assess the Aquatic Life and Primary and Secondary Contact Recreational Uses.

### PARADISE POND (SEGMENT MA81097)

Location: Princeton

Segment Area: 61.0 Acres

Classification: Class A, PWS

2006 Integrated List of Waters: Category 3 - No Uses Assessed

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
<p>A non-native species (<i>Myriophyllum heterophyllum</i>) has been observed in Paradise Pond.</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants</p> <p><b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional)</p> <p style="text-align: right;"><i>Data Sources: 10</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
Recommendations		
<p>Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.</p> <p>Conduct water quality monitoring to assess Primary and Secondary Recreational Use.</p>		

Note: Drinking Water Use is also a designated use for this waterbody.

**PARTRIDGE POND (ELLIS POND, SMITH POND) (SEGMENT MA81098)**

Location: Westminster

Segment Area: 25.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 5 - Waters Requiring a TMDL -Noxious aquatic plants, Turbidity

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
<p>A non-native species (<i>Myriophyllum heterophyllum</i>) has been observed in Partridge Pond. In September 2003 MassDEP DWM measured dissolved oxygen, temperature, and pH profiles and collected water quality samples at the deepest hole in Partridge Pond. The quantity of water quality data collected in 2003 is insufficient to identify additional aquatic life impairments.</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants  <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional)  <i>Data Sources: 28, 30</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
<p>Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.</p> <p>Conduct water quality monitoring to assess Primary and Secondary Recreational Use.</p>		

**FLOW SHOP POND (SEGMENT MA81103)**

Location: Ayer

Segment Area: 29.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 5 - Waters Requiring a TMDL -Metals (See Special Note 2),

Noxious aquatic plants, ( Exotic species\*) \* denotes a non-pollutant.

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
<p>A non-native species (<i>Cabomba caroliniana</i>) has been observed in Plow Shop Pond. Garrett Fleming, Inc. completed an ecological risk assessment of Plow Shop Pond in 2006 using the sediment, soils, surface water, biota, benthic invertebrates, fish, frog tissue, swallow tissue, and toxicity data collected to date. The risk assessment indicated an unacceptable risk to benthic invertebrates due to metals in the sediment.</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants, sediment bioassays - chronic toxicity, PAH</p> <p><b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional), contaminated sediments, contaminated groundwater, unknown</p> <p style="text-align: right;"><i>Data Sources: 2, 10, 22</i></p>		
<b>Fish Consumption</b>	<b>Impaired</b>	<b>No</b>
<p>MA DPH has issued a fish consumption advisory due to mercury contamination for Plow Shop Pond. The general public should refrain from consuming any fish species (municipality issued advisory).</p> <p><b>Cause(s) of Impairment:</b> Mercury in fish tissue</p> <p><b>Source(s) of Impairment:</b> Atmospheric deposition - toxics, unknown</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Impaired</b>	<b>No</b>
<p>Gannett Fleming, Inc. conducted a Human Health Risk Assessment (HHRA) for Plow Shop Pond as part of an expanded site investigation of Fort Devens, a Superfund National Priority List site. The HHRA found that the carcinogenic risk threshold 1 E-4 was exceeded for the recreational adult and recreational child receptors. The carcinogenic risk drivers included arsenic (surface water and sediment) and PAHs (sediment). The non-cancer Hazard Index (HI) risk threshold of 1 was exceeded for the recreational adult and recreational child. The noncarcinogenic risk drivers included arsenic (sediment) and chromium (sediment).</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants, aquatic plants (macrophytes), arsenic. PAH, chromium</p> <p><b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional), contaminated sediments, contaminated groundwater, unknown</p> <p style="text-align: right;"><i>Data Sources: 2</i></p>		

Secondary Contact	Impaired	No
<p>Gannett Fleming, Inc. conducted a Human Health Risk Assessment (HHRA) for Plow Shop Pond as part of an expanded site investigation of Fort Devens, a Superfund National Priority List site. The HHRA found that the carcinogenic risk threshold 1 E-4 was exceeded for the recreational adult and recreational child receptors. The carcinogenic risk drivers included arsenic (surface water and sediment) and PAHs (sediment). The non-cancer Hazard Index (HI) risk threshold of 1 was exceeded for the recreational adult and recreational child. The noncarcinogenic risk drivers included arsenic (sediment) and chromium (sediment). The dense macrophyte coverage impairs the Aesthetic Use, which in turn also impairs Secondary Contact Use.</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants, aquatic plants (macrophytes), arsenic. PAH, chromium</p> <p><b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional), contaminated sediments, contaminated groundwater, unknown</p> <p style="text-align: right;"><i>Data Sources: 2</i></p>		
Aesthetics	Impaired	No
<p>Aquatic macrophytes seasonally cover 75 percent of Plow Shop Pond's surface area.</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants, aquatic plants (macrophytes)</p> <p><b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional), unknown</p> <p style="text-align: right;"><i>Data Sources: 2</i></p>		
Recommendations		

### ROBBINS POND (SEGMENT MA81111)

Location: Harvard

Segment Area: 11.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 4c - Impairment not Caused by a pollutant -Exotic species

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
Aquatic Life	Impaired	No
<p>A non-native species (<i>Potamogeton crispus</i>) has been observed in Robbins Pond.</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants</p> <p><b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional)</p> <p style="text-align: right;"><i>Data Sources: 22</i></p>		
Fish Consumption	Not Assessed	No
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
Primary Contact	Not Assessed	No
No data were available to assess the Primary Contact Use.		
Secondary Contact	Not Assessed	No
No data were available to assess the Secondary Contact Use.		

<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.		
Conduct water quality monitoring to assess Primary and Secondary Recreational Use.		

### SAWMILL POND (SEGMENT MA81118)

Location: Fitchburg/Westminster

Segment Area: 65.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 4c - Impairment not Caused by a pollutant Exotic species

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
A non-native species ( <i>Myriophyllum heterophyllum</i> ) has been observed in Sawmill Pond. <b>Cause(s) of Impairment:</b> Non-native aquatic plants <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional) <i>Data Sources: 22</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.		
Conduct water quality monitoring to assess Primary and Secondary Recreational Use.		

**STUART POND (SEGMENT MA81137)**

Location: Sterling

Segment Area: 42.0 Acres

Classification: Class A, PWS

2006 Integrated List of Waters: Category 4c - Impairment not Caused by a pollutant Exotic species

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
A non-native species ( <i>Myriophyllum heterophyllum</i> ) has been observed in Stuart Pond. <b>Cause(s) of Impairment:</b> Non-native aquatic plants <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional) <i>Data Sources: 22</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3). <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants. Conduct water quality monitoring to assess Primary and Secondary Recreational Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

**STUMP POND (SEGMENT MA81171)**

Location: Holden

Segment Area: 27.0 Acres

Classification: Class A, PWS

2006 Integrated List of Waters: Category 4c - Impairment not Caused by a pollutant Exotic species

NPDES Discharges: None

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
A non-native species ( <i>Myriophyllum heterophyllum</i> ) has been observed in Stump Pond. <b>Cause(s) of Impairment:</b> Non-native aquatic plants <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional) <i>Data Sources: 22</i>		

<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).		
<i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.		
Conduct water quality monitoring to assess Primary and Secondary Recreational Use.		

Note: Drinking Water Use is also a designated use for this waterbody.

### UNIONVILLE POND (SEGMENT MA81143)

Location: Holden

Segment Area: 19.0 Acres

Classification: Class A, PWS

2006 Integrated List of Waters: Category 4c - Impairment not Caused by a pollutant Exotic species

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
A non-native species ( <i>Myriophyllum spicatum</i> ) has been observed in Unionville Pond.		
<b>Cause(s) of Impairment:</b> Non-native aquatic plants, eurasian milfoil		
<b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional)		
<i>Data Sources: 10, 22</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).		
<i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		

Recommendations
Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.
Conduct water quality monitoring to assess Primary and Secondary Recreational Use.

Note: Drinking Water Use is also a designated use for this waterbody.

### WACHUSETT RESERVOIR (SEGMENT MA81147)

Location: Boylston/West Boylston/Clinton/Sterling

Segment Area: 3966.0 Acres

Classification: Class A, PWS

2006 Integrated List of Waters: Category 5 - Waters Requiring a TMDL -Metals (See Special Note 2)

NPDES Discharges: Massachusetts Water Resources Authority (MA0040134), issued October 2002 with authorization to discharge treated drinking water to the Wachusett Reservoir from their Cosgrove Intake Facility.

WMA Withdrawals: Clinton Water Department (21106403), Leominster DPW Water Division (21115302), MWRA (21106402)

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
<p>Three non-native species (<i>Myriophyllum spicatum</i>, <i>Myriophyllum heterophyllum</i>, <i>Cabomba caroliniana</i>) were observed in Wachusett Reservoir during a MA DCR survey in 2002. MA DCR collected a significant quantity of water quality data from 2001 to 2005 (dissolved oxygen, pH, and temperature profiles, nutrients, Secchi disk, and phytoplankton). None of the data indicates additional impairments to aquatic life uses in the Wachusett Reservoir.</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants, eurasian milfoil  <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional)  <i>Data Sources: 5, 6, 7, 8, 9, 10, 22</i></p>		
<b>Fish Consumption</b>	<b>Impaired</b>	<b>No</b>
<p>MA DPH has issued a fish consumption advisory due to mercury contamination for Wachusett Reservoir. Children younger than 12, pregnant women, and nursing women should refrain from consuming all fish in Wachusett Reservoir except lake trout less than 24 inches long and Salmon. The general population should refrain from consuming smallmouth bass, largemouth bass, and lake trout greater than 24 inches long. The general public may consume unlimited Salmon and lake trout less than 24 inches long. The general public should limit consumption of all other fish species to one five-ounce meal per week.</p> <p><b>Cause(s) of Impairment:</b> Mercury in fish tissue  <b>Source(s) of Impairment:</b> Atmospheric deposition - toxics, unknown  <i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected fecal coliform samples from 2001 to 2005 on an approximately monthly basis at 23 to 25 sites in the Wachusett Reservoir. The maximum annual geometric mean at any site in any year was 7 CFU/100ml. These results do not violate the geometric mean criterion (126 CFU/100ml) for <i>Escherichia coli</i>.  <i>Data Sources: 5, 6, 7, 8, 9</i></p>		
<b>Secondary Contact</b>	<b>Support</b>	<b>No</b>
<p>See Special Note 1. MA DCR collected fecal coliform samples from 2001 to 2005 on an approximately monthly basis at 23 to 25 sites in the Wachusett Reservoir. The maximum annual geometric mean at any site in any year was 29 CFU/100ml. These results do not violate the geometric mean criterion (630) CFU/100ml) for <i>Escherichia coli</i>.  <i>Data Sources: 5, 6, 7, 8, 9</i></p>		

<b>Aesthetics</b>	<b>Support</b>	<b>No</b>
MA DCR conducts annual water quality sampling in Wachusett Reservoir. Between 2001 and 2005 there was no data indicating prolonged or frequent occurrences of objectionable deposits, odors, turbidity or color, floating scum, or overabundant growths of aquatic plants or algae. The Secchi disk depth during this time period ranged from 16 to 30 feet.  <i>Data Sources: 5, 6, 7, 8, 9</i>		
<b>Recommendations</b>		
Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.		

Note: Drinking Water Use is also a designated use for this waterbody.

### **WHITE POND (SEGMENT MA81155)**

Location: Lancaster/Leominster

Segment Area: 47.0 Acres

Classification: Class B

2006 Integrated List of Waters: Category 4c - Impairment not Caused by a pollutant -Exotic species

NPDES Discharges: None

WMA Withdrawals: None

<b>Designated Use</b>	<b>Use Assessment</b>	<b>Alert</b>
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
A non-native species ( <i>Myriophyllum heterophyllum</i> ) has been observed in White Pond. <b>Cause(s) of Impairment:</b> Non-native aquatic plants <b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional) <i>Data Sources: 22</i>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).  <i>Data Sources: 13</i>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants. Conduct water quality monitoring to assess Primary and Secondary Recreational Use.		

**WYMAN POND (GRASSY POND (SEGMENT MA81161))**

Location: Westminster

Segment Area: 198.0 Acres

Classification: Class A, PWS

2006 Integrated List of Waters: Category 4c - Impairment not Caused by a pollutant -Exotic species

NPDES Discharges: City of Fitchburg Department of Public Works (MAG640039), issued November 2001 with authorization to discharge 0.7 MGD of effluent from the Fitchburg Regional Water Filtration Plant in Westminster to Wyman Pond.

WMA Withdrawals: None

Designated Use	Use Assessment	Alert
<b>Aquatic Life</b>	<b>Impaired</b>	<b>No</b>
<p>A non-native species (<i>Myriophyllum heterophyllum</i>) has been observed in Wyman Pond.</p> <p><b>Cause(s) of Impairment:</b> Non-native aquatic plants</p> <p><b>Source(s) of Impairment:</b> Introduction of non-native organisms (accidental or intentional)</p> <p style="text-align: right;"><i>Data Sources: 22</i></p>		
<b>Fish Consumption</b>	<b>Not Assessed</b>	<b>No</b>
<p>This waterbody does not have a site-specific fish consumption advisory. All applicable statewide fish consumption advisories issued by MA DPH due to mercury contamination apply to this waterbody (See Special Note 3).</p> <p style="text-align: right;"><i>Data Sources: 13</i></p>		
<b>Primary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Primary Contact Use.		
<b>Secondary Contact</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Secondary Contact Use.		
<b>Aesthetics</b>	<b>Not Assessed</b>	<b>No</b>
No data were available to assess the Aesthetic Use.		
<b>Recommendations</b>		
<p>Continue to monitor for the presence of invasive non-native aquatic vegetation and determine the extent of the infestation. Prevent spreading of invasive aquatic plants.</p> <p>Conduct water quality monitoring to assess Primary and Secondary Recreational Use.</p>		

Note: Drinking Water Use is also a designated use for this waterbody.

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