NEPONSET RIVER SUBWATERSHED- RIVER AND ESTUARY SEGMENT ASSESSMENTS

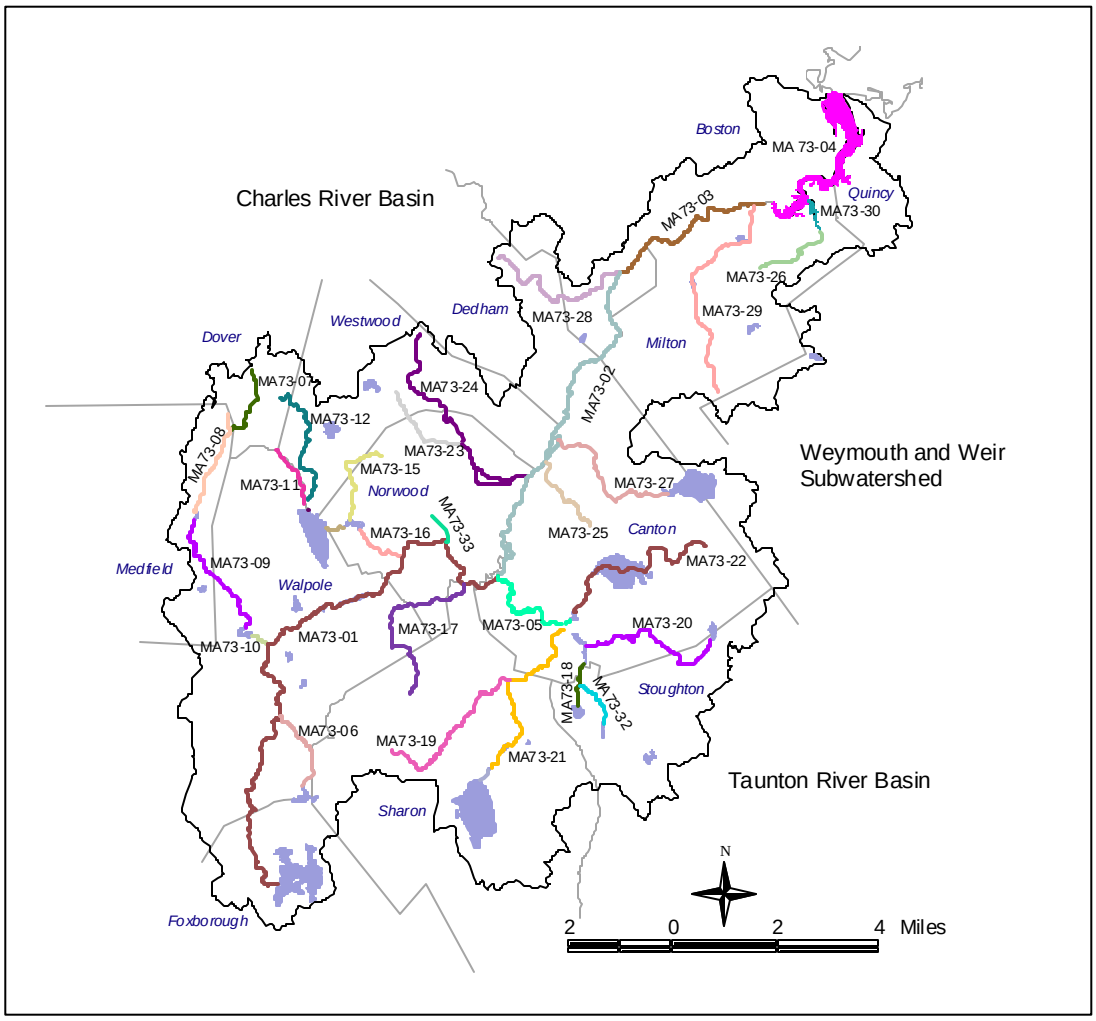


Figure 16. River/Estuarine Segments in the Neponset River Subwatershed

GENERAL ISSUES/RECOMMENDATIONS FOR THE NEPONSET RIVER SUBWATERSHED

Water quantity is an important issue throughout the Boston Harbor Watershed. The majority of public water, whether from local supplies or through the interbasin transfer of water from Quabbin Reservoir in central Massachusetts by the MWRA, is processed at the MWRA's Deer Island Wastewater Treatment Plant and discharged to Massachusetts Bay, bypassing local streams. Recharge of the local systems is mainly limited to precipitation events and low streamflow is a serious problem.

Above and beyond the water brought in from the Quabbin or water pumped from local aquifers, the sewer collection system drains an even larger amount of clean rain water and ground water from the Boston Harbor Watershed in the form of inflow and infiltration -- water which finds its way into the sewer system through cracks, poor joints, and illegal cross connections. Inflow and Infiltration accounts for approximately 60% of overall sewer flow in the MWRA collection system, with some communities showing I/I rates of up to 75%. The overwhelming majority of the I/I problems are associated with municipal portions of the regional sewer system and not with the MWRA owned/operated lines. The municipal element includes both I/I in the 5,400+ miles of sewer lines owned/maintained by the municipality, and the 5,000+ miles of privately owned lateral connections. Infiltration is a major problem relative to groundwater loss. Inflow is most often associated with storm events and peak flows and tends to be a major cause of Sanitary Sewer Overflows/backups. This loss of water essentially reduces available streamflow, and threatens instream uses such as aquatic life, habitat quality and quantity and recreational uses. A comprehensive regional I/I control program, involving the MWRA, municipal and privately owned sections of the sewer, should be developed to identify and remove sources of inflow and infiltration. A key component of the program is to develop a preventive and reactive Operation, Maintenance and Rehabilitation program; without Operation, Maintenance and Rehabilitation, sewer systems will continue to deteriorate and I/I will increase (Cooke and Lipman 2002).

Strong conservation measures through implementation strategies such as block rate pricing, installation of water-saving devices in homes and public buildings, and tying outdoor water use restrictions to streamflow levels, in concert with a strong educational program, will all help reduce the stress placed on the water resources throughout the Boston Harbor Watershed (Cooke and Lipman 2002).

Bacteriological contamination of waterbodies is a concern in the Neponset River Subwatershed and throughout the Boston Harbor Watershed. Pathogens may enter a waterbody as point or non-point source pollution. Point sources in the watershed are generally addressed under the National Pollutant Discharge Elimination System permitting program. Nonpoint source pollution can include urban runoff, faulty septic systems, and illegal/cross connections between the sewer and stormdrain systems. To improve water quality in the Neponset River Subwatershed, EPA/MA DEP sent letters to two communities (Milton and Norwood), requesting information regarding dry weather discharges from storm water discharge pipes. Included in the information requested are maps of the location and size of the municipal storm water outfalls; maps of the location of any combined sewer/stormdrain manholes, sewer underdrains, and siphon structures; visual observations at all storm water discharge locations; outfall sampling from each discharge at least twice for fecal coliform bacteria and a plan to identify and eliminate illegal sewer discharges to stormdrains. The communities have responded to the letter and have taken action to identify and eliminate illegal discharges.

Under the Title 5 Program, the Commonwealth has developed three programs to assist homeowners with wastewater management problems. The Homeowner Septic Loan Program provides low interest loans to homeowners to upgrade systems that will not pass Title 5 inspections. The Comprehensive Community Septic Management Program provides betterment loans to communities to target known or suspected failures or to develop a community-wide management plan. The third option allows homeowners to claim tax credits for septic upgrades. Additional information about the Title 5 Program is available online from the MA DEP website http://www.state.ma.us/dep/brp/wwm/T5pubs.htm#add. In the Neponset River Subwatershed, the towns of Canton, Milton, Sharon, Stoughton, and Walpole have participated in the Comprehensive Community Septic Management Program (Chesebrough 2002).

The Neponset River TMDL, being developed by EPA, MA DEP and other stakeholders, will establish bacterial limits and outline actions to prevent further water quality degradation. Implementation of the

TMDL will occur through a basin wide strategy that includes development of a comprehensive storm water management program, identifying and eliminating illicit discharges, and inspection and upgrade of on-site sewage disposal systems.

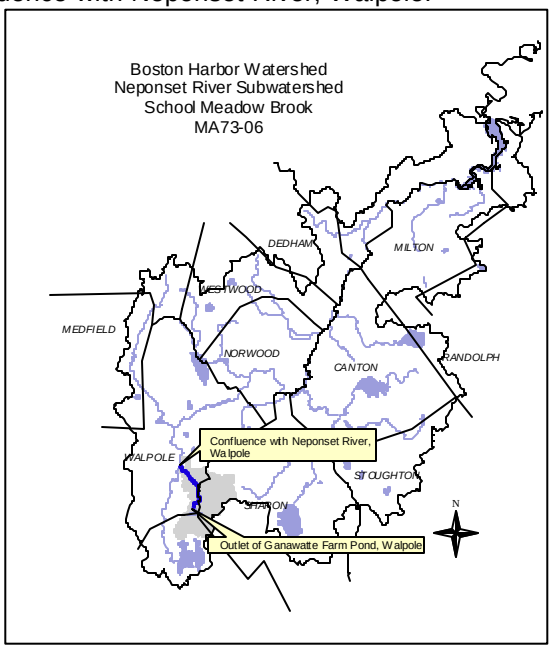
RECOMMENDATIONS

- Work with water suppliers, dam managers, and local citizens to minimize the impacts caused by the out of basin transfer of water in the Neponset River Subwatershed.

- Determine the status of the septic system repairs being implanted under the Title 5 program in Canton, Milton, Sharon, Stoughton, and Walpole.

SCHOOL MEADOW BROOK (SEGMENT MA73-06)

Location: Outlet of Ganawatte Farm Pond, Walpole to confluence with Neponset River, Walpole.
Segment Area: 1.7 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	59%
Residential	15%
Open Land	7%

There is one dam located along this segment, Shacounda Dam (Hershman Pond), which is maintained by Sharon Country Day Camp (Ryan, 2001). Additional information on dams in Massachusetts may be obtained from MA DEM at http://www.state.ma.us/dem/ and a MassGIS datalayer showing the location of dams in Massachusetts will soon be available at: http://www.state.ma.us/dem/programs/gis/de%5Fdl.htm.

The use assessment for Gannawatte Farm Pond is provided in the Lakes section of this assessment report (Table 11).

WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)	1999 Average Withdrawal (MGD)
Walpole Sewer & Water Department	3307000	9P31930702	31930701	05,06, 08-10G	1.09 (permitted)* 2.25 (registered)*	3.02

* System-wide withdrawal

NPDES SURFACE DISCHARGE SUMMARY:
Metal Bellows Corp (MA0002305) is permitted to discharge 1,500 GPD via outfall 001 and 20,000 GPD via outfall 002. The seven-day 10-year low flow (7Q10) of the receiving stream (School Meadow Brook) is 0.07 MGD. The permit expired on 18 August 1991 and the facility is currently inactive.

All communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE
Chemistry – water
The Neponset River Watershed Association (NepRWA) conducted bimonthly water quality monitoring in School Meadow Brook from 1997 to 2001 at one station SMB013 – School Meadow Brook at Washington Street. Water quality samples were analyzed for dissolved oxygen, pH, temperature, total suspended solids, ammonia, and total phosphorus (NepRWA 1998, 1999, 2001a and b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature
All temperature measurements were below the SWQS for a Class B waterbody (28.3°C).

pH
pH ranged between 6.3 and 7.8 SU (n=10) with only two samples below 6.5 SU.

Total Suspended Solids
TSS concentrations ranged between 0 and 23.35 mg/L (n=14).

Ammonia-Nitrogen (as N)
Ammonia concentrations collected in 1999 and 2000 ranged between 0.003 and 0.060 mg/L (n=9).

Phosphorus (as P)
Total phosphorus concentrations in 1999 and 2000 ranged from 0.003 to 0.072 mg/L (n=9).

Too little instream data (temporal and spatial coverage, no biological indicators) were available to assess the *Aquatic Life Use*: therefore, it is currently not assessed.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

Fecal coliform bacteria sampling in School Meadow Brook was conducted by NepRWA in conjunction with water quality monitoring (NepRWA 1998, 1999, 2001a and b). Fecal levels ranged between 8 and 440 cfu/100mL. One of the 15 samples had fecal coliform bacteria counts above 400 cfu/100mL. Samples were collected during both wet and dry weather conditions with both high counts collected during wet weather conditions.

Based on the low fecal coliform bacteria counts during both wet and dry weather conditions over multiple years and land use estimates, the *Primary* and *Secondary Contact Recreational Uses* are assessed as support.

School Meadow Brook (MA73-06) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		NOT ASSESSED				
Fish Consumption		NOT ASSESSED				
Primary Contact		SUPPORT				
Secondary Contact		SUPPORT				
Aesthetics		NOT ASSESSED				

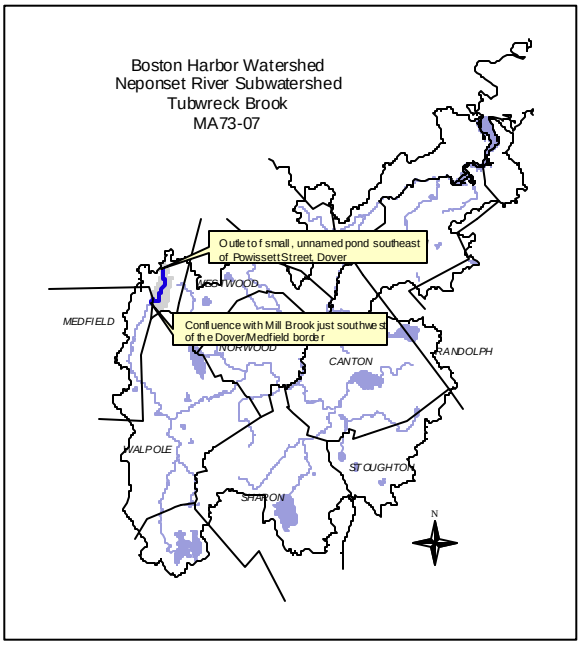
TUBWRECK BROOK (SEGMENT MA73-07)

Location: Headwaters outlet of small, unnamed pond southeast of Powissett Street, Dover, to the confluence with Mill Brook just southwest of the Dover/Medfield border.
Segment Area: 1.6 miles.
Classification: Class B.

Land-use estimates for the subwatershed (map inset, gray shaded area):

Residential	52%
Forest	36%
Agriculture	12%

Tubwreck Brook has been identified by DFWELE as a Coldwater Fishery Resource and has proposed that this segment be reclassified in the SWQS (MassWildlife 2001).



WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)	1999 Average Withdrawal (MGD)
Dover Water Company	3078006	9P231907801		04G 05G	0.14*	0.12

* System-wide withdrawal

The towns of Medfield and Dover withdraw water from wells in the Neponset River Subwatershed to be used in the towns of Medfield and Dover in the Charles River Basin. Since the water is both withdrawn and utilized in the town from which it was pumped from, the WMA registrants are not subject to the Inter-basin Transfer Act.

NPDES SURFACE DISCHARGE SUMMARY:

There are no regulated wastewater discharges to this segment. All communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

Tubwreck Brook (MA73-07) Use Summary Table

Aquatic Life	Fish Consumption	Primary Contact	Secondary Contact	Aesthetics
				
Not Assessed				

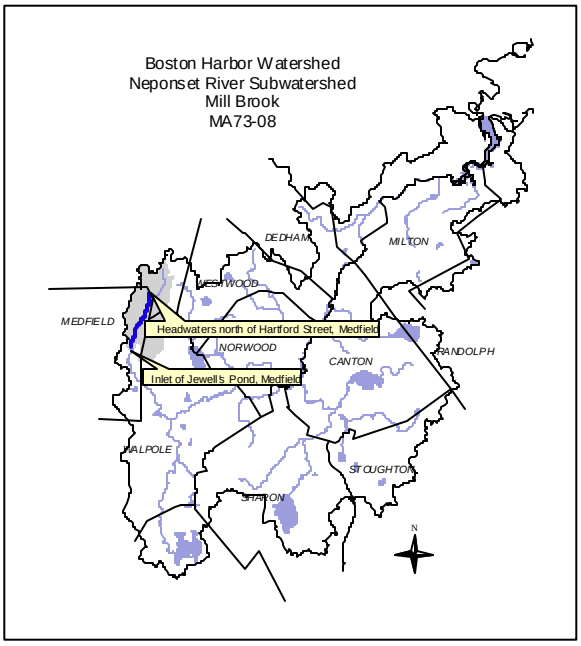
RECOMMENDATIONS TUBWRECK BROOK (MA73-07)

- In the next revision of the Massachusetts Surface Water Quality Standards, consider (in consultation with DFWELE) designating Tubwreck Brook as a Cold Water Fishery.

- Work with the EOEA Watershed Team and NepRWA to collect quality assured water quality and bacteria data to assess the designated uses

MILL BROOK (SEGMENT MA73-08)

Location: From its headwaters north of Hartford Street, Medfield, to inlet of Jewells Pond, Medfield.
Segment Area: 2.3 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	58%
Residential	33%
Agriculture	5%

This segment is on the 1998 303(d) list of impaired waters for unknown causes (MA DEP 1999a).

WMA WATER WITHDRAWAL AND SURFACE NPDES DISCHARGE SUMMARY:
There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from MA DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Biology

During July 1999, DWM conducted benthic macroinvertebrate and fish population sampling at one station on this segment: MB01—Mill Brook, downstream from Millbrook Road, Medfield. The benthic macroinvertebrate community at this station was “slightly impacted” when compared to both the Hawes Brook warm water reference station and the Traphole Brook cold water reference station. The community was dominated by chironomid species typically associated with low flow conditions.

Fish species present in order of abundance included brook trout (*Salvelinus fontinalis*), darter (*Etheostoma olmstedi*), redfin pickerel (*Esox americanus*), chain pickerel (*Esox niger*), and largemouth bass (*Micropterus salmoides*), indicative of a cold-water fishery (Appendix C).

Habitat/Flow

During the 1999 DWM benthic macroinvertebrate survey, the habitat assessment identified extremely low baseflow resulting in much exposed benthos habitat. It was estimated that only about 50% of the stream channel contained water despite the heavy rain received during the previous week (Appendix C). It should be noted that 1999 was a drought year. Average monthly stream flows in June were lower than have been recorded in decades (USGS 5 June 2001).

It should be noted that approximately 95% of the subwatershed is sewered and approximately 42% of the municipal water supply withdrawn in the Neponset River Subwatershed is transferred via the MWRA sewer system to Massachusetts Bay (Kennedy *et al.* 1995).

At station MB01, pollution tolerant benthic and fish species were identified, suggesting that habitat quality (low flow induced habitat constraints), rather than water quality, limits biological potential. Based on a

slightly impacted benthic community and low flow conditions, the *Aquatic Life Use* is assessed as partial support

AESTHETICS

During the July 1999 benthic macroinvertebrate survey, DWM also conducted a habitat assessment (Appendix C). No objectionable deposits, odors or colors were noted, although slight sediment deposition from storm water runoff was noted at the Millbrook Road crossing. The stream appeared to be of high aesthetic quality.

Based on the overall high aesthetic quality of the Mill Brook, the *Aesthetics Use* is assessed as support.

Mill Brook (MA73-08) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		PARTIAL SUPPORT	Unknown, flow alteration		Unknown	Water withdrawal
Fish Consumption		NOT ASSESSED				
Primary Contact		NOT ASSESSED				
Secondary Contact		NOT ASSESSED				
Aesthetics		SUPPORT				

RECOMMENDATIONS MILL BROOK (MA73-08)

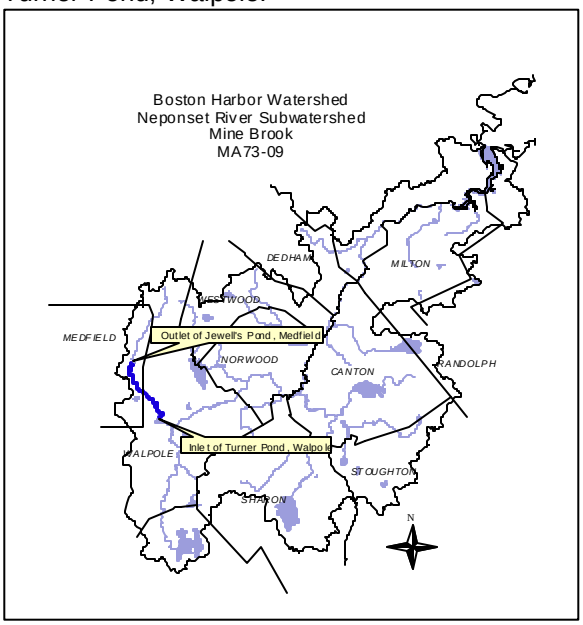
- Work with DFWELE to determine if Mill Brook supports a cold water fishery.

- Determine if the low flows identified in 1999 were indicative of drought conditions or were also affected by water use in the subwatershed. It should be noted that since 95% of the subwatershed is sewered the majority of the water withdrawn in the Neponset River Subwatershed is not returned to this subwatershed. It is treated at the MWRA Deer Island facility and discharged to Massachusetts Bay. Additionally, the Dover Water Company has requested an increase in flow and is renovating an existing well. The combination of these two activities may further strain the water resources in the Mill/Mine subwatershed

- Excerpted from Appendix C- 1999 DEP DWM Biomonitoring Technical Memorandum *Technical Memorandum (TM-71/1):*
  - Outreach efforts should be aimed at consumers to make them aware of the environmental consequences of ever-increasing demands for water, and of measures that can be taken to alleviate existing adverse effects on limited water supplies.
  - Instream deposition threatens biological integrity at MB01 as well. Sediment inputs—which can be detrimental to trout spawning habitat and epifaunal benthos habitat, and that most likely originate from the Millbrook Road crossing—should be minimized here.
  - Biomonitoring (macroinvertebrates and fish) is recommended here during the next DEP watershed survey in 2004.

MINE BROOK (SEGMENT MA73-09)

Location: Outlet of Jewells Pond, Medfield, to the inlet of Turner Pond, Walpole.
Segment Area: 3.0 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	55%
Residential	33%
Wetlands	5%

This segment is on the 1998 303(d) list of impaired waters for organic enrichment/ low DO (MA DEP 1999a). The use assessments for Jewells and Flynns ponds are provided in the Lakes section of this assessment report (Table11). In 2001, DFWELE stocked trout in Mine Brook for the purpose of recreational fishing (DFWELE 15 March 2001).

WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)	1999 Average Withdrawal (MGD)
Medfield Water Department	3175000		31917501	03G 04G	0.92*	0.55
Walpole Water Department	3307000	9P31930702	31930701	02G 03G	1.09 (permitted)* 2.25 (registered)*	3.02

* indicates system-wide withdrawal, all sources are not necessarily within this segment

The towns of Medfield and Dover withdraw water from wells in the Neponset River Subwatershed to be used in the towns of Medfield and Dover in the Charles River Basin. Since the water is both withdrawn and utilized in the town from which it was pumped from, the WMA registrants are not subject to the Inter-basin Transfer Act.

NPDES SURFACE DISCHARGE SUMMARY:
There are no regulated wastewater discharges to this segment. All communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from MA DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Chemistry – water

NepRWA conducted bimonthly water quality monitoring in Mine Brook at Mill Pond Road (MIB060 1998) and at Elm Street (MIB037 1999 – 2001). Water quality samples were analyzed for DO, temperature, pH, total suspended solids, ammonia, and total phosphorus (NepRWA 1999, 2001a and b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

DO

It should be noted that during DWM's 1994 survey of Mine Brook dissolved oxygen concentrations ranged from 3.2 to 9.6 mg/L with three of the nine samples less than 5.0mg/L. Percent saturations recorded during the 1994 survey ranged from 39.4 to 75.25% with three saturations less than 60% (Kennedy *et al*. 1995).

Temperature

While only three samples were collected during the summer months, all temperature measurements (n=10) were below the SWQS for a Class B waterbody.

pH

pH ranged between 6.1 and 6.5 SU (n=10) with eight samples below 6.5 SU. Land use information and field observations identify this subwatershed as over 50% forested with conifers, which may contribute to low pH.

Total Suspended Solids

TSS concentrations ranged between BDL and 3.3 mg/L (n=19).

Ammonia-Nitrogen (as N)

Ammonia concentrations ranged between 0.008 and 0.071 mg/L (n=20). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged between 0.032 and 0.073 mg/L (n=6).

Although there were no obvious signs of water quality degradation, too little data were available to assess the *Aquatic Life Use* (not assessed).

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

Fecal coliform bacteria sampling in Mine Brook was conducted by NepRWA in conjunction with water quality monitoring at Mill Pond Road (1998) and at Elm Street (1999 – 2001). Sampling was conducted during both wet and dry weather conditions (NepRWA 1999, 2001a and b). Fecal coliform bacteria levels ranged between 1 and 570 cfu/100mL (n=20) with only one sample over 400 cfu/100mLs.

Fecal coliform bacteria counts were low during both wet and dry weather conditions and therefore both the *Primary* and *Secondary Contact Recreational* uses are assessed as support.

AESTHETICS

NepRWA's water quality sampling of Mine Brook indicated relatively low instream turbidity with good water clarity (NepRWA 1999, 2001a and b). The majority of the land in this subwatershed is forested.

Based on the good water quality, overall high aesthetic quality and land use estimates of Mine Brook the *Aesthetics Use* is assessed as support.

Mine Brook (MA73-09) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		NOT ASSESSED				
Fish Consumption		NOT ASSESSED				
Primary Contact		SUPPORT				
Secondary Contact		SUPPORT				
Aesthetics		SUPPORT				

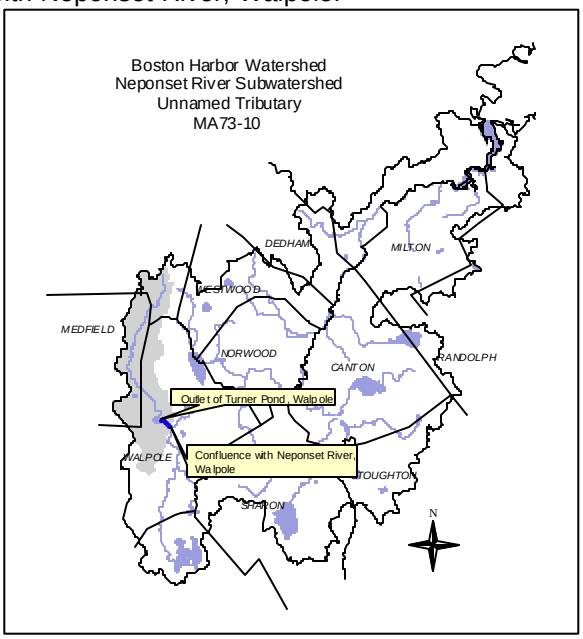
UNNAMED TRIBUTARY (SEGMENT MA73-10)

Location: Outlet Turner Pond in Walpole, to confluence with Neponset River, Walpole.
Segment Area: 1.1 miles.
Classification: Class B.

Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	51%
Residential	32%
Open land	5%

The use assessment for Turner Pond is provided in the Lakes section of this assessment report (Table 11).



WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)	1999 Average Withdrawal (MGD)
Walpole Water Department	3307000	9P31930702	31930701	01G 11G	1.09 (permitted)* 2.25 (registered)*	3.02

* indicates system-wide withdrawal, all sources are not necessarily within this segment

NPDES SURFACE DISCHARGE SUMMARY:

There are no regulated wastewater discharges to this segment. All communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from MA DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

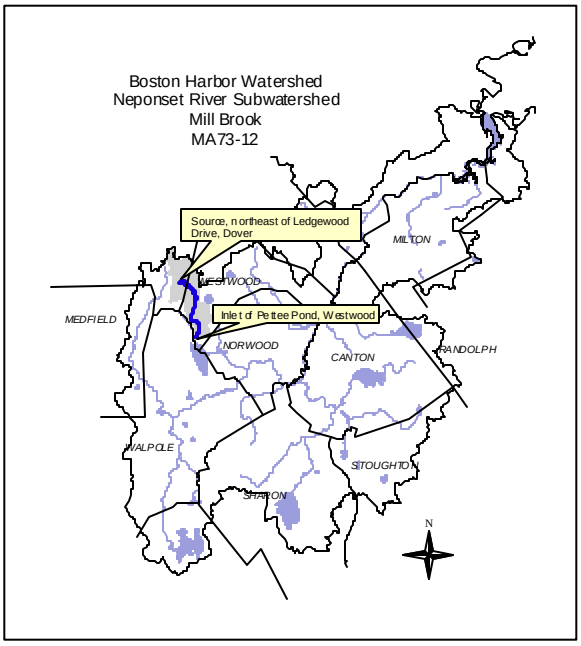
USE ASSESSMENT

Unnamed Tributary (MA73-10) Use Summary Table

Aquatic Life	Fish Consumption	Primary Contact	Secondary Contact	Aesthetics
				
Not Assessed				

MILL BROOK (SEGMENT MA73-12)

Location: Source, northeast of Ledgewood Drive, Dover to inlet of Pettee Pond, Westwood.
Segment Area: 3.1 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	54%
Residential	39%
Agriculture	3%

WMA WATER WITHDRAWAL SUMMARY AND NPDES SURFACE DISCHARGE SUMMARY:

There are no regulated water withdrawals or wastewater discharges in this segment. All communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from MA DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Chemistry – water

NepRWA conducted water quality monitoring at the inlet to Pettee Pond (MLB024) in 2000 and 2001. Water quality samples were analyzed for temperature and pH (NepRWA 2001b).

Temperature

All temperature measurements were below the SWQS (n=2) for a Class B waterbody.

pH

pH measured on 24 May was 7.6 SU and on 26 July was 6.6 SU.

Although there were no obvious signs of water quality degradation, too little instream data (temporal and spatial coverage, no biological indicators) were available to assess the *Aquatic Life Use*: it is currently not assessed.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

Fecal coliform bacteria sampling in Mill Brook was conducted by NepRWA in conjunction with water quality monitoring. Fecal coliform concentrations measured 24 cfu/100mL and 36 cfu/100mL on the two sampling dates (NepRWA 2001b).

Too little instream bacteria (temporal and spatial coverage) were available to assess the recreational uses: they are currently not assessed.

Mill Brook (MA73-12) Use Summary Table

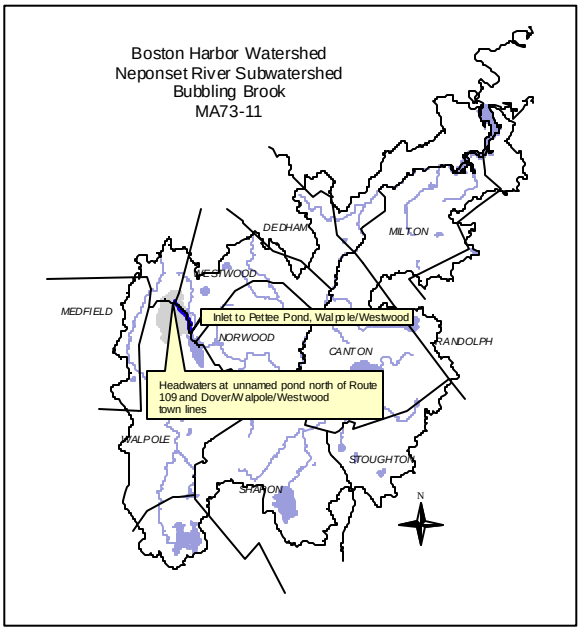
Aquatic Life	Fish Consumption	Primary Contact	Secondary Contact	Aesthetics
				
Not Assessed				

RECOMMENDATIONS MILL BROOK (MA73-12)

- Work with NepRWA, DFWELE, and concerned parties (e.g., North Walpole Fish and Game Club) to determine if Mill Brook supports a cold water fishery.

BUBBLING BROOK (SEGMENT MA73-11)

Location: Headwaters, at a small, unnamed pond north of Route 109 and Dover/Walpole/Westwood town lines, to inlet Pettee Pond, Walpole/Westwood town lines.
Segment Area: 1.1 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	83%
Residential	23%
Agriculture	14%

WMA WATER WITHDRAWAL AND SURFACE NPDES DISCHARGE SUMMARY:

There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from MA DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

Bubbling Brook (MA73-11) Use Summary Table

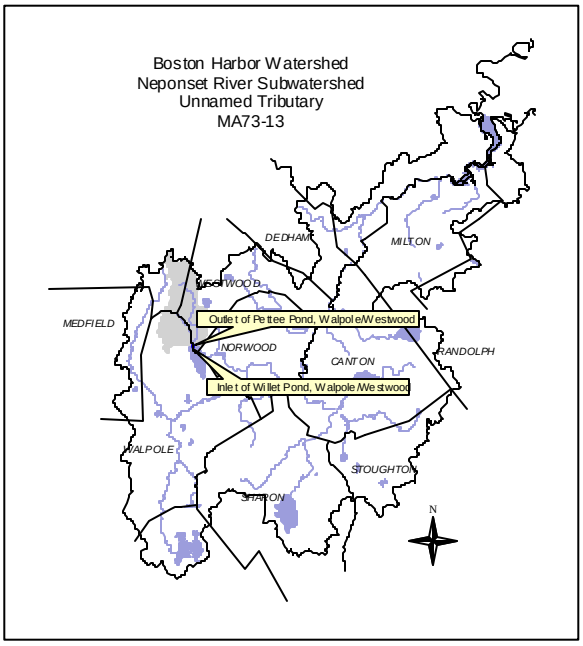
Aquatic Life	Fish Consumption	Primary Contact	Secondary Contact	Aesthetics
				
Not Assessed				

RECOMMENDATIONS BUBBLING BROOK (MA73-11)

- Work with NepRWA, DFWELE, and concerned parties to determine if Bubbling Brook supports a cold water fishery.

UNNAMED TRIBUTARY (SEGMENT MA73-13)

Location: Outlet Pettee Pond Walpole/Westwood to inlet Willet Pond, Walpole/Westwood
Segment Area: 0.03 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	54%
Residential	34%
Agriculture	7%

WMA WATER WITHDRAWAL AND SURFACE NPDES DISCHARGE SUMMARY:

There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from MA DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

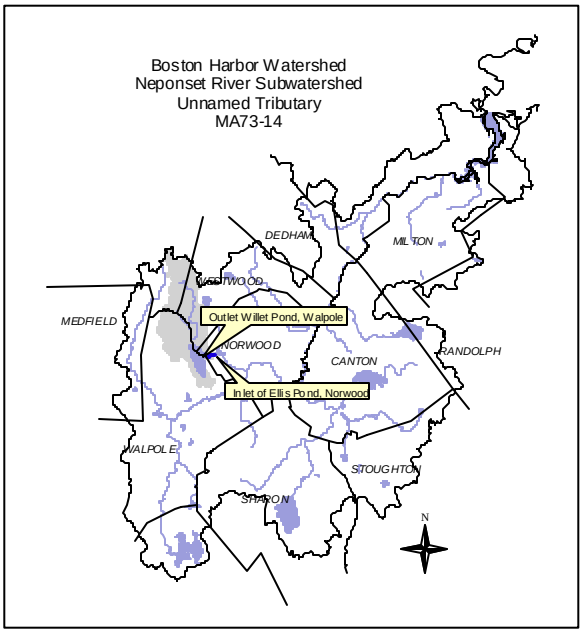
USE ASSESSMENT

Unnamed Tributary (MA73-13) Use Summary Table

Aquatic Life	Fish Consumption	Primary Contact	Secondary Contact	Aesthetics
				
Not Assessed				

UNNAMED TRIBUTARY (SEGMENT MA73-14)

Location: Outlet Willet Pond, Walpole, to inlet Ellis Pond, Norwood
Segment Area: 0.36 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	46 %
Residential	37%
Agriculture	7%

There is one small (four to five foot) dam located along this segment, maintained by the Norwood Fishing Club (NepRWA 2002).

WMA WATER WITHDRAWAL AND SURFACE NPDES DISCHARGE SUMMARY:

There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from MA DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

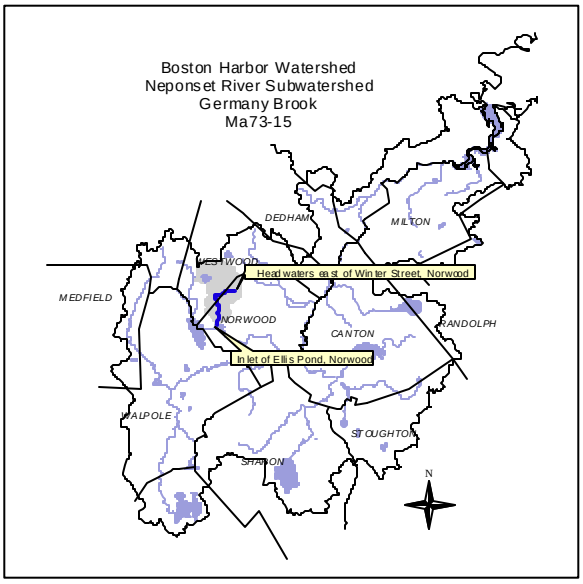
USE ASSESSMENT

Unnamed Tributary (MA73-14) Use Summary Table

Aquatic Life	Fish Consumption	Primary Contact	Secondary Contact	Aesthetics
				
Not Assessed				

GERMANY BROOK (SEGMENT MA73-15)

Location: Headwaters, east of Winter Street, Norwood, to inlet of Ellis Pond, Norwood.
Segment Area: 2.0 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Residential	58%
Forest	30%
Open Land	10%

This segment is on the 1998 303(d) list of impaired waters for pathogens (MA DEP 1999a).
The use assessment for Buckmaster Pond is provided in the Lakes section of this assessment report (Table 11).

WMA WATER WITHDRAWAL SUMMARY AND NPDES DISCHARGE SUMMARY:

There are no regulated water withdrawals or wastewater discharges in this segment. All communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from MA DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

Information on former landfills in the Boston Harbor Watershed is provided in Appendix F. The Norwood Landfill, located in this subwatershed, was partially capped and is currently inactive.

USE ASSESSMENT

AQUATIC LIFE

Chemistry – water

NepRWA conducted bimonthly water quality monitoring in Germany Brook at Sycamore Drive (GEB008) and at the inlet of Ellis Pond (GEB020) from 1997 to 2001. Water quality samples were analyzed for, dissolved oxygen, temperature, pH, total suspended solids, ammonia, and total phosphorus (NepRWA 1998, 1999, 2001a and b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature

All temperature measurements (n=24) were below the SWQS for a Class B waterbody.

pH

pH ranged between 6.4 and 8.6 SU (n=22) with one less than 6.5 SU and three samples greater than 8.3.

Total suspended solids

TSS concentrations ranged between BDL and 21.0 mg/L (n=24).

Ammonia-Nitrogen (as N)

Ammonia concentrations ranged between 0.003 and 0.423 mg/L (n=21). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged between 0.028 and 0.112 mg/L (n=21) with two concentrations above 0.10 mg/L.

The *Aquatic Life Use* is assessed as partial support in Germany Brook due to the frequency of pH violations and elevated nutrients.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

Fecal coliform bacteria sampling in Germany Brook was conducted by NepRWA in conjunction with water quality monitoring (NepRWA 1998, 1999, 2001a and b). Samples were collected during wet and dry weather conditions. Fecal coliform bacteria counts ranged from 0 to 29,000 cfu/100mL (n=27). The highest count was recorded during wet weather. During the primary contact recreation season, seven of the 15 samples were greater than 400 cfu/100mL. Additionally, four wet weather samples throughout the years were greater than 4,000 cfu/100mL. Since 1999 there have been no fecal coliform bacteria counts above the dry or wet weather guidance.

Based on the percentage of elevated fecal coliform bacteria counts (33%) during the primary recreation season the *Primary Contact Recreational Use* is assessed as non-support. Bacteria counts exceeded 4,000 cfu/100mL during wet weather conditions therefore the *Secondary Contact Recreational Use* is assessed as partial support.

AESTHETICS

During their bimonthly water quality monitoring in Germany Brook at the inlet of Ellis Pond NepRWA identified a distinct reddish tone to the water (NepRWA 2001b). Additionally, yard waste is being dumped into this brook by local residents (NepRWA 2002). NepRWA's water quality sampling indicated relatively low instream turbidity (NepRWA 1998, 1999, 2000, 2001a and b).

Due to the degraded aesthetic quality and the objectionable color the Aesthetics Use is assessed as partial support.

Germany Brook (MA73-15) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		PARTIAL SUPPORT	pH, nutrients		Unknown	Illicit/faulty sewer connections
Fish Consumption		NOT ASSESSED				
Primary Contact		NON-SUPPORT	Pathogens		Urban runoff/ storm sewers	Illicit/faulty sewer connections
Secondary Contact		PARTIAL SUPPORT	Pathogens		Urban runoff/ storm sewers	Illicit/faulty sewer connections
Aesthetics		PARTIAL SUPPORT	Color, trash and debris		Urban runoff/ storm sewers	Landfill

RECOMMENDATIONS GERMANY BROOK (MA73-15)

- Determine if the Norwood Landfill is leaching into the ground water or surface water of Germany Brook, thereby, contributing to the low pH and reddish floc/water color.

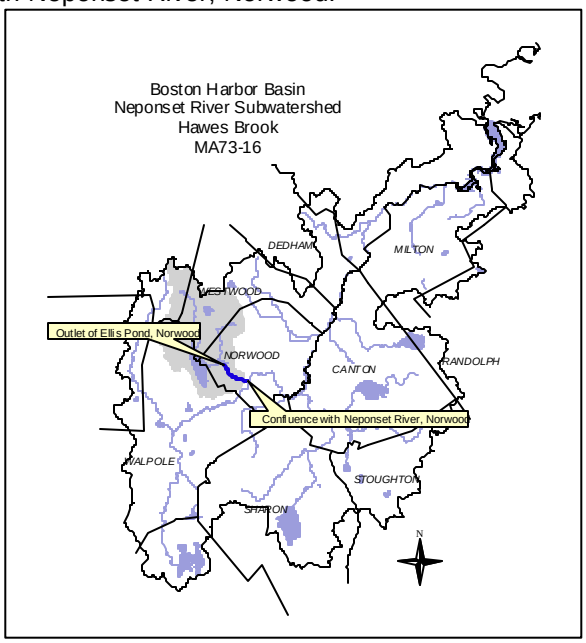
- Investigate sources of elevated nutrients in the Germany Brook subwatershed (e.g., illicit/faulty sewer connections).

- Determine possible sources of elevated levels of fecal coliform bacteria during dry weather including the reduction/elimination of illegal cross connections.

- Implement an outreach program to educate citizens as to proper yard waste disposal practices and the negative impact of excessive nutrients and organic matter on streams.

HAWES BROOK (SEGMENT MA73-16)

Location: Outlet of Ellis Pond, Norwood to confluence with Neponset River, Norwood.
Segment Area: 1.1 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Residential	45%
Forest	37%
Open Land	7%

This segment is on the 1998 303(d) list of impaired waters for pathogens (MA DEP 1999a).

The use assessments for Willis and Ellis ponds are provided in the Lakes section of this assessment report (Table 11).

Ellis Pond Dam is located at the outlet of Ellis Pond in the headwaters of this segment. This dam, rebuilt in 1998, is maintained by the Town of Norwood. The Soap Mill Pond Dam at the Commerce Center (located along this segment) is maintained by the Town of Norwood (NepRWA 2002).

WMA WATER WITHDRAWAL AND SURFACE NPDES DISCHARGE SUMMARY:

There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from MA DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

During extreme rainfall events the Town of Norwood sewer system overflows raw sewage through two known sanitary sewer overflow (SSO) locations along this segment of Hawes Brook (NepRWA 2002).

USE ASSESSMENT

AQUATIC LIFE

Biology

During July 1999, DEP DWM conducted a benthic macroinvertebrate survey at the downstream end of this segment, downstream from Washington Street, Norwood (NE09). This station was the warm-water reference station for DWM's 1999 Boston Harbor benthic macroinvertebrate surveys. This station had high habitat quality and was indicative of clean water and "least-impacted" conditions (Appendix C).

Fallfish (*Semotilus corporalis*), American eel (*Anguilla rostrata*), bluegill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), and white sucker (*Catostomus commersoni*) were identified on DWM's 1999 fish population survey (NE09). This fish assemblage was dominated by pond species, which are most likely emigrating from the many upstream impoundments (Appendix C).

Additionally, MassWildlife Northeast District conducted fish population work on this segment in 2000. The seven species collected, in order of dominance, were: fallfish, bluegills, pumpkinseeds, white suckers, American eels, largemouth bass, and yellow bullhead. DFWELE determined that this segment did not support a cold water fishery (Richards 2001).

Habitat

Although the stream was channelized with riprap and concrete block walls, habitat quality was considered good during the July 1999 DEP DWM benthic macroinvertebrate survey. Additionally, some substrate embeddedness (gravel, cobble, and boulder substrates surrounded by fine sediment) and green algae were noted (Appendix C). At the upstream end of this segment, during a DWM fall 2001 field reconnaissance sand deposition was noted in the stream channel.

Chemistry – water

NepRWA collected bimonthly water quality samples at three locations on Hawes Brook between 1997 and 2001: Washington Street (HAB010), Walpole Street (HAB002), and Endean Park, railroad bridge (HAB006). Parameters measured included DO, temperature, total suspended solids, total phosphorus, and ammonia (NepRWA 1998, 1999, 2001a and b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature

All temperature measurements (n=44) were below the SWQS for a Class B waterbody.

Total Suspended Solids

TSS concentrations ranged between BDL and 64 mg/L (n=59) with only three samples greater than 25 mg/L.

Ammonia-Nitrogen (as N)

Ammonia concentrations ranged between 0.002 and 0.574 mg/L (n=44). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus levels ranged between 0.021 and 0.87 mg/L (n=46) with fourteen greater than 0.05 mg/L.

The *Aquatic Life Use* is assessed as support based on the high habitat quality associated with the benthic macroinvertebrate reference station (located on this segment). However, Hawes Brook is on "Alert Status" due to the potential negative effects of instream sediment deposition on aquatic life and elevated nutrients.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

NepRWA conducted fecal coliform bacteria sampling (n=78) at their three water quality locations on Hawes Brook (NepRWA 1998, 1999, 2001a and b). Sampling was conducted during wet and dry weather conditions. Fecal coliform levels ranged between 0 and 4,200 cfu/100mL with two counts elevated above 4,000 cfu/100mL (collected during wet weather). During the primary contact recreation season 14 of the 40 samples were above 400 cfu/100mL. Additionally, during extreme rainfall events the Town of Norwood sewer system overflows via two SSOs to this segment of Hawes Brook (NepRWA 2002). It should be noted that the Town of Norwood initiated a Hawes Brook I/I study in Feb. 2001.

Based on the frequency of elevated fecal coliform bacteria counts during the primary contact recreation season, the *Primary Contact Recreational Use* is assessed as non-support. No counts were elevated above 4,000 cfu/100mL during dry weather conditions and the frequency of elevated counts during wet weather was low. Therefore, the *Secondary Contact Recreational Use* is assessed as support.

AESTHETICS

DWM field observations from the fall of 2001 revealed overall high aesthetic quality with good stream cover and a relatively large buffer zone. Localized areas of sedimentation and some trash and debris associated with road runoff were also noted. During their bimonthly water quality monitoring in Hawes Brook, NepRWA identified pipes discharging from the Shaw's plaza, and a strong bitter

chemical smell (NepRWA 2001). Additionally, trash and debris have been identified in the streambed near the Commerce Center and the Shaw's Plaza.

Based on the evidence of trash and debris associated with storm water runoff and objectionable odors, Hawes Brook is assessed as partial support for the *Aesthetics Use*.

Hawes Brook (MA73-16) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life*		SUPPORT*				
Fish Consumption		NOT ASSESSED				
Primary Contact*		NON-SUPPORT	Pathogens		Municipal point source (SSO)	
Secondary Contact		SUPPORT				
Aesthetics		PARTIAL SUPPORT	Trash and debris, odors		Urban runoff/storm sewers	

* "Alert Status" issues identified; see *Aquatic Life Use* assessment

RECOMMENDATIONS HAWES BROOK (MA73-16)

- Conduct a shoreline clean up of Hawes Brook and work with local property owners (industrial, state and private), school groups, local citizens and stream teams to reduce future trash inputs.

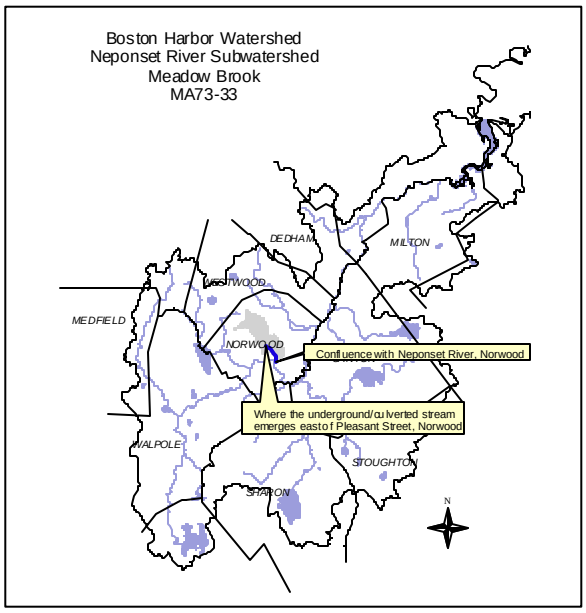
- Implement an outreach program to educate citizens as to proper yard waste disposal practices and the negative impact of excessive nutrients on streams.

- Work with the Town of Norwood to eliminate the discharge of raw sewage through sanitary sewer overflow (SSO) locations and to minimize the immediate impacts of these current overflows. When available review the CDM report on the Town of Norwood's SSO problems.

- Work with NepRWA to implement their CWMN recommendations for Hawes Brook.

UNNAMED TRIBUTARY (SEGMENT MA73-33)

Location: From where the underground/culverted stream emerges east of Pleasant Street, Norwood to confluence with Neponset River, Norwood. (Locally known as Meadow Brook)
Segment Area: 0.7 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Residential	70%
Commercial	14%
Open Land	8%

Meadow Brook begins at the Norwood/Westwood town line near Nahatan Street and is culverted under the Town of Norwood for almost its entire length before it emerges from a box culvert southeast of Pleasant Street. It is above ground for 0.7 miles before it confluences with the Neponset River south of Dean Street and west of Rte 1. Fecal coliform bacteria contamination in Meadow Brook has been traced to deteriorating sewer system pipes discharging into underdrains. Norwood has been actively addressing this problem. In the fall of 2000 Norwood completed a 3-year $150,000 flow-monitoring program of the wastewater collection system using flow meters. During the summer of 2001, through its consultant, Norwood attempted to identify direct connections to the underdrain system using smoke testing. Norwood is also currently using MWRA I/I financial assistance to fund a $198,000 project to account for all active sanitary connections that have underdrains in the Meadow Brook watershed by televising all service connections from the main line sewer back towards the building. Additionally, potential sources of exfiltration to the storm drains will be noted. Connections to the sanitary sewer will be confirmed using dye testing. This work will commence in March 2002 (Storrs 2002).

WMA WATER WITHDRAWAL AND SURFACE NPDES DISCHARGE SUMMARY:
There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Chemistry – water
NepRWA collected bimonthly water quality samples at two stations on Meadow Brook between 1997 and 1998: Sunnyside Road (MEB001) and Dean Street (MEB006). During 1999 and 2000, NepRWA collected water quality samples only at Sunnyside Road (MEB001). Parameters measured included DO, temperature, total suspended solids, total phosphorus (as P), and ammonia (NepRWA 1998, 1999, 2001a and 2001b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature
All temperature measurements (n=34) were below the SWQS for a Class B waterbody.

pH

pH ranged between 6 and 8.0 SU with only two less than 6.5 SU (n=35).

Total Suspended Solids

TSS concentrations ranged between BDL and 81 mg/L (n=38) with only three samples greater than 25 mg/L during wet weather conditions.

Ammonia-Nitrogen (as N)

Ammonia concentrations ranged between 0.082 and 4.746 mg/L (n=37). All measurements were below the acute and chronic criterion for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus levels ranged between 0.05 and 1.15 mg/L (n=35) with 31 greater than 0.1 mg/L.

The *Aquatic Life Use* is assessed as partial support due to elevated nutrients.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

NepRWA conducted fecal coliform bacteria sampling (n=78) at their water quality locations on Meadow Brook (NepRWA 1998, 1999, 2001). Sampling was conducted during wet and dry weather conditions. Fecal coliform levels ranged between 84 and 86,000 cfu/100mL. During the primary contact recreation season counts ranged between 84 and 86,000 cfu/100mL with 25 of the 27 samples above 400 cfu/100mL. Fifteen of the 25 counts above 400 cfu/100mL were collected during dry weather conditions.

Fecal coliform contamination in Meadow Brook has been traced to deteriorating sewer drains discharging into underdrains. Norwood has been actively addressing this problem. In the fall of 2000 Norwood completed a 3-year $150,000 flow-monitoring program of the wastewater collection system using flow meters. During the summer of 2001, through its consultant, Norwood attempted to identify direct connections to the underdrain system using smoke testing. Norwood is also currently using MWRA I/I financial assistance to fund a $198,000 project to account for all active sanitary connections that have underdrains in the Meadow Brook watershed by televising all service connections from the main line sewer back towards the building. Additionally, potential sources of exfiltration to the storm drains will be noted. Connections to the sanitary sewer will be confirmed using dye testing. This work commenced in March 2002 (Storrs 2002).

Based on the frequency of elevated fecal coliform bacteria counts during both wet and dry weather conditions, the *Primary* and *Secondary Contact Recreational* uses are assessed as non-support.

AESTHETICS

During DWM fall 2001 reconnaissance, objectionable colors (grey water) and odors (sewage and chlorine) were noted on Meadow Brook. Additionally, a warning sign posted adjacent to Meadow Brook noted that, “water may be contaminated at times”.

Based on the evidence of objectionable odors and color, Meadow Brook is assessed as non-support for the *Aesthetics Use*.

Meadow Brook (MA73-33) Use Summary Table

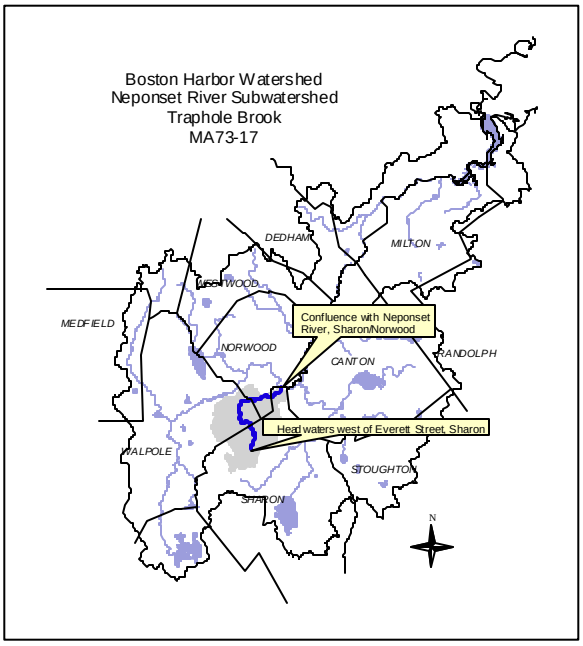
Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		PARTIAL SUPPORT	Nutrients		Municipal point source (Illicit connections/ underdrains)	
Fish Consumption		NOT ASSESSED				
Primary Contact		NON-SUPPORT	Pathogens		Municipal point source (Illicit connections/ underdrains)	
Secondary Contact		NON-SUPPORT	Pathogens		Municipal point source (Illicit connections/ underdrains)	
Aesthetics		NON-SUPPORT	Taste, odor, and color		Municipal point source (Illicit connections/ underdrains)	

RECOMMENDATIONS MEADOW BROOK (MA73-33)

- Continue to work with the Town of Norwood to identify and eliminate leaking sewers/illicit connections to underdrains.

TRAPHOLE BROOK (SEGMENT MA73-17)

Location: Headwaters west of Everett Street, Sharon, to confluence with Neponset River, Sharon/Norwood.
Segment Area: 3.5 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	42%
Residential	32%
Open Land	10%

This segment is on the 1998 303(d) list of impaired waters for pathogens (MA DEP 1999a).

This segment of Traphole Brook is within the Fowl Meadow and Ponkapoag Bog ACEC (MA DEM August 2000).

In 2001, DFWELE stocked trout in Traphole Brook for the purpose of recreational fishing (DFWELE 15 March 2001).

WMA WATER WITHDRAWAL AND SURFACE NPDES DISCHARGE SUMMARY:

There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Biology

During July 1999, DEP DWM sampled the benthic macroinvertebrate community downstream from Coney Street, Walpole at station 5B01 (Appendix C). This station was the cold water reference station for DWM's 1999 Boston Harbor benthic macroinvertebrate surveys. The Traphole Brook benthos assemblage was dominated by highly pollution-sensitive taxa. The balanced trophic structure and optimum community structure further define this as a good reference station.

During DWM's fish population survey, a total of 76 fish were collected in the 5B01 sampling reach. The sample included 29 brown trout (*Salmo trutta*) and 47 brook trout (*Salvelinus fontinalis*).

Additionally, MassWildlife Northeast District conducted fish population work on this segment in 1979, 1986, 1995, and 2000. In 2000, 201 fish were collected; 86 white suckers, 44 redfin pickerel, 37 brown trout, 14 banded sunfish, seven brook trout, and two swamp darters (Richards 2001). These data indicate that this brook supports a cold water fishery.

Habitat

The benthic macroinvertebrate sampling reach was dominated by clear cool riffles with rocky substrates and no signs of sediment deposition noted during sampling. The streambanks were well vegetated with a minimally disturbed riparian zone. Interstate 95 and Route 1 are potential sources or non-point source (NPS) pollution (Appendix C). Sand bars and sedimentation problems have been

identified in Traphole Brook by NepRWA and DFWELE. Between January and April 2001, DFWELE interns conducted a habitat assessment of Traphole Brook. They found that storm drains are depositing sand and sediments at various locations throughout the brook (DFWELE 2001b).

Chemistry – water

NepRWA conducted bimonthly water quality monitoring in Traphole Brook at three stations in 1997 (THB008, THB020 and THB026) and Coney Street (THB020) from 1999 to 2001. Water quality samples were analyzed for dissolved oxygen, temperature, pH, total suspended solids, ammonia, and total phosphorus (as P) (NepRWA 1998, 2001a and b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature

All temperature measurements (n=20) were below the SWQS for a Class B waterbody.

pH

pH ranged between 6.4 and 8.2 SU (n=18) with one below 6.5 SU.

Total suspended solids

TSS concentrations ranged between BDL and 126 mg/L (n=20). The only sample greater than 25 mg/L was collected during wet weather conditions.

Ammonia-Nitrogen (as N)

Ammonia concentrations ranged between 0.004 and 0.04 mg/L (n=20). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged between 0.003 and 0.146 mg/L (n=19) with three measurements greater than 0.1 mg/L (16%).

Based on the healthy benthic macroinvertebrate community (pollution intolerant) and water chemistry data the *Aquatic Life Use* is assessed as support. Traphole Brook is, however, on "Alert Status" based on the possible negative effects from high levels of phosphorus and sediment deposition.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

DEP OWM's 1994 assessment of Traphole Brook identified elevated levels of fecal coliform bacteria and chlorides that may be indicative of failing septic systems (Kennedy et al 1995). NepRWA collected fecal coliform bacteria samples at three stations on Traphole Brook in 1997 (THB008, THB020, and THB026) and at one station (THB020) in 1999, 2000 /2001 (NepRWA 1998, 2001a, and 2001b). Samples were collected during both wet and dry weather conditions. Fecal coliform bacteria counts (n=15) during the primary recreation season ranged between 36 and 1,500 cfu/100mL with three counts greater than 400 cfu/100mL, all collected during dry weather on 25 June 1997 at stations THB008, THB020 and THB026.

Since 1997 no fecal coliform bacteria counts have been elevated, therefore the *Primary* and *Secondary Contact Recreational* uses are assessed as support.

AESTHETICS

Minimal nonpoint sources of pollution were identified during the July 1999 DWM biomonitoring survey (Appendix C). There was no evidence of objectionable conditions (i.e., odors, trash and debris, oils). NepRWA's water quality sampling indicated relatively low instream turbidity with good water clarity (NepRWA 1999, 2000, 2001). However, as part of their habitat assessment of Traphole Brook in 2001, DFWELE interns identified multiple storm drains discharging milky white substances and orange substances, some with rotten egg odors, in the Coney Street, Union Street, and Sumner Street sections of Traphole Brook (DFWELE 2001b).

Due to good water clarity and the localization and infrequency of trash and debris/objectionable discharges associated with storm events, it is best professional judgment that the *Aesthetics Use* be assessed as support. Traphole Brook is, however, on "Alert Status" due to trash and debris and discharges associated with storm events.

Traphole Brook (MA73-17) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life*		SUPPORT*				
Fish Consumption		NOT ASSESSED				
Primary Contact		SUPPORT				
Secondary Contact		SUPPORT				
Aesthetics*		SUPPORT*				

* "Alert Status" issues identified — See *Aquatic Life* and *Aesthetics* use assessments

RECOMMENDATIONS TRAP HOLE BROOK (MA73-17)

- In the next review of the SWQS, recommend that the designation of Traphole Brook be changed to Class B, Cold Water Fishery.

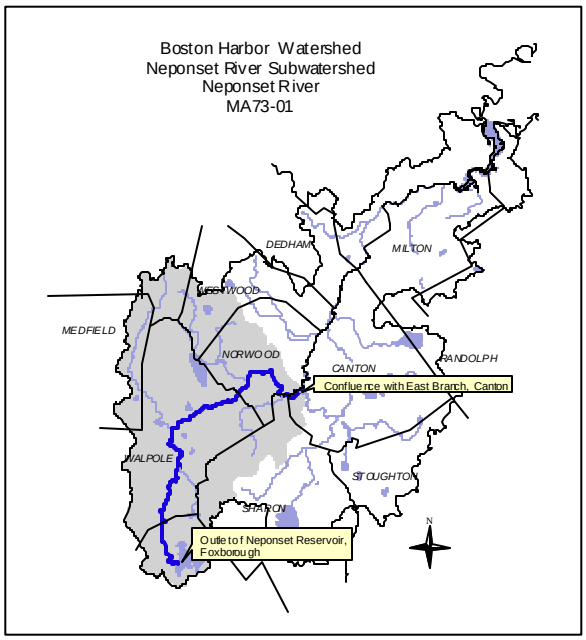
- Work with MassHighways, to reduce road runoff from I95 and Route 1 to Traphole Brook including the implementation of sediment control BMPs.

- Work with NepRWA, DFWELE and MassHighway to identify and eliminate the sources of rotten-egg smelling, colored storm drain discharges to Traphole Brook.

- Continue to track the progress of Norwood's sewer repair projects. Monitor fecal coliform bacteria levels during wet and dry weather conditions to determine the effectiveness of remediation efforts.

NEPONSET RIVER (SEGMENT MA73-01)

Location: Outlet of Neponset Reservoir, Foxborough to confluence with East Branch, Canton.
Segment Area: 13.7 miles.
Classification: Class B Warm Water Fishery.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	40%
Residential	35%
Open land	8%

This segment of the Neponset River is on the 1998 303(d) list of impaired waters for priority organics, metals, nutrients, siltation, organic enrichment/ low DO, pathogens, total suspended solids, noxious aquatic plants, and turbidity (MA DEP 1999a). The use assessments for Neponset Reservoir, Crackrock, Clark, Memorial, and Bird ponds, as well as Plimpton Pond South, are provided in the Lakes section of this assessment report (Table 11). There are five dams on this segment of the Neponset River: Neponset Reservoir Dam, Crackrock Pond Dam, Neponset River Dam, Stetson Pond Dam, and Bird Pond Dam. This segment of the Neponset River is within the Neponset River Estuary ACEC and the Fowl Meadow and Ponkapoag Bog ACEC (MA DEM August 2000).

USGS collected sediment (September 1999 and August 2000) and white sucker (September 1998 and August 2000) from the Neponset River below Pleasant Street in Norwood (gage 01105000) as part of their Toxics Substances Hydrology Program (an extension of the National Mercury Pilot Study), Urban Land Use Gradient Study (part of the NAWQA program) and the DEP Merrimack Valley Fish Study. The sediment was analyzed for total and methyl mercury, trace elements and organic compounds (Chalmers 2001). Seven-eight fillet composites were analyzed for trace elements and 7-8 whole body composites were analyzed for organic compounds. The data from these analyses are not yet available (Chalmers 2001).

WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)*	1999 Average Withdrawal (MGD)
Foxborough Water Department	4099000	9P41909901	41909901	01G 02G 03G 12G 13G	0.73 (permitted)* 0.64 (registered)*	Not available
Walpole Sewer and Water Department	3307000	9P31930702	31930701	12G 13G	1.09 (permitted)* 2.25 (registered)*	3.02
Hollingsworth & Vose Company			31930702	Mill Pond	1.02	0.20
Walpole Country Club		9P31930701		Irrigation Pond	0.1	0.15

* System-wide withdrawal

NPDES SURFACE DISCHARGE SUMMARY:

Baker Process (formerly known as Bird Machine Company) (MA00002300) is permitted to discharge NCCW (Temperature limit = 83°F) and storm water (TSS = 50 mg/L) to this segment of the Neponset River. The permit expired October 30, 2000.

Hollingsworth and Vose (MA0004570) is permitted to discharge NCCW and wastewater to the Neponset River. The facility however, is currently tied into the MWRA sewer system and has never used their NPDES permit.

Certainteed (formerly known as Bird Roofing)- Norwood (MA0003531 expires 30 October 2002) is permitted to discharge via four outfalls to this segment of the Neponset River. The facility is permitted to discharge 40,000 GPD of contact cooling water via outfall 001. This outfall has an average monthly temperature limit of 83^{o}F, a daily maximum of 90 ^{o}F, a TSS average monthly limit of 40 mg/L, and a daily maximum of 70 mg/L. The whole effluent toxicity limit for outfall 1 is $LC_{50} \geq 100\%$. The facility is also permitted to discharge non-contact cooling water via outfall 002 and treated storm water via 003 and 004.

Factory Mutual Engineering- Norwood (MA0003638) is permitted to discharge sprinkler testing water to the Neponset River subwatershed. The permit is currently out for review (2001). The previous facilities permit (expired 1 April 2001) limits for whole effluent toxicity were $LC_{50} \geq 100\%$ and CNOEC = 100% effluent. TRC concentrations in the effluent (n=10) from April 1998 to March 2001 were between BDL and 0.090 mg/L (TOXTD database).

All communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Biology

USGS conducted biomonitoring on the Neponset River at Norwood (150 m reach downstream from Pleasant St bridge) as part of the NAWQA Northeast Coastal Basins study during 1999 and 2000 (Beaulieu 2001). Their sampling included reach delineation and fish community assessment. Fish species collected included American eel (*A. rostrata*), bluegill (*L. macrochirus*), fallfish (*S. corporalis*), largemouth bass (*M. salmoides*), pumpkinseed (*L. gibbosus*), red breasted sunfish (*L. auritus*), spottail (*Notropis hudsonius*), white sucker (*C.* commersoni), and chain pickerel (*E. niger*). Many species present in this assemblage are macrohabitat generalists (able to survive and prosper in a number of habitat types) typically found in ponds, however, the samples are numerically dominated by organisms that spend their entire life cycle in lotic systems (Maietta 2001). Macroinvertebrate/algal sample collection and habitat assessment data are expected to be available in the spring of 2002.

Toxicity

Effluent

Between April 1998 and March 2001, Factory Mutual Engineering conducted ten whole effluent toxicity tests using the water flea, *C. dubia* and the fathead minnow, *P. promelas*. *C. dubia* whole effluent LC_{50}'s ranged between 16.5 to >100% effluent with four of nine tests < 100% effluent. P. *promelas* whole effluent LC_{50}'s ranged between 17.4 to >100% effluent with four of ten tests < 100% effluent.

Between April 1998 and March 2001, Certainteed/Bird Roofing conducted eight whole effluent toxicity tests using the *C. dubia* and nine using *P. promelas*. The effluent was not acutely toxic to *C. dubia* and. P. *promelas* (LC_{50} > 100%).

Ambient

Factory Mutual Engineering collects water from the Neponset River (at Pleasant Street) for use as a diluent control in their whole effluent toxicity tests. Between April 1998 and March 2001, Factory

Mutual conducted ten tests using *C. dubia* and *P. promelas.* Survival of *C. dubia* and *P. promelas* exposed (48 hr) to the river water was good (not less than 95%).

Certainteed/Bird Roofing collects water upstream from their outfall on the Neponset River for use as dilution water in their whole effluent toxicity tests. Between July 1999 and March 2001, Certainteed/Bird Roofing conducted four tests using *C. dubia* and five tests using *P. promelas.* Survival of *C. dubia* and *P. promelas* exposed (48 hr) to the river water was good (100%).

Habitat/Flow

Flow in the Neponset River at Norwood, (gage #01105000) was recorded by USGS as part of the NAWQA program. Discharges ranged from 4.4 to 206 cfs between October 1998 and September 2000 (Socolow *et al.* 1999 and Socolow *et al.* 2000). The sixty-year average discharge at this gage is 56.1cfs. It should be noted that 1999 was a drought year. Average monthly flows in June were lower than have been recorded in decades (USGS 5 June 2001).

Downstream from Crackrock Pond the Neponset River historically flowed under Foxborough Raceway into the raceway infield where it was above ground for approximately ¼ mile. Recently, the River has been day-lighted and rerouted next to the railroad tracks away from the new Gillette Stadium. As of winter 2001 the construction was still underway.

Chemistry – water

NepRWA collected bimonthly water quality samples at six stations on this segment of the Neponset River between 1997 and 2001:

NER002- Neponset River at outlet of Crackrock Pond (1999-2001)
NER021- Neponset River at Summer Street (1998)
NER040- Neponset River at South Street (1999-2001)
NER075- Neponset River at Hollingsworth and Vose Dam (1997-2001)
NER080- Neponset River at Pleasant Street Bridge (1999-2001)
NER095- Neponset River at Neponset Street (1997)

Parameters measured included DO, temperature, pH, TSS, ammonia, and total phosphorus (as P). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

As part of the NAWQA program, USGS sampled the Neponset River at their streamflow gage in Norwood. Monthly samples for DO, temperature, pH, ammonia-nitrogen (as N), and total phosphorus (as P) were collected between October 1999 and September 2000 (Socolow *et al.* 1999 and Socolow *et al.* 2000).

Factory Mutual Engineering collects water from the Neponset River (at Pleasant St) for use as a diluent control in their whole effluent toxicity tests. Ambient chemistry analyses included: pH, TSS, ammonia, and hardness (TOXTD database).

DO

NAWQA dissolved oxygen concentrations ranged from 6.6 to 15.2 mg/L (n=28). No measurements were collected pre-dawn and, therefore, these data do not represent worst-case conditions.

Temperature

All temperature measurements (n=49) were below the SWQS for a Class B waterbody.

pH

At NepRWA's four stations, pH ranged between 6.6 and 8.4 SU (n=53). pH at the USGS gage in Norwood ranged from 6.8 to 7.6 SU (n=26). Measurements of pH in the Neponset River at Pleasant Street reported by Factory Mutual ranged between 6.1 and 7.5 SU (n=10). Measurements of pH in the Neponset River reported by Bird Roofing ranged between 6.5 and 7.8 SU (n=8). Of the 79 total pH measurements, only one was below 6.5 SU.

Total Suspended Solids

NepRWA reported TSS concentrations (n=57) ranging from BDL to 35 mg/L with only one number greater than 25 mg/L (wet weather).

Ammonia-Nitrogen (as N)

Ammonia concentrations reported by NepRWA ranged from BDL to 0.295 mg/L (n=58). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Ammonia-nitrogen (as N) concentrations reported by NAWQA ranged from BDL to 0.184 mg/L (n=28). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Ammonia concentrations reported by Bird Roofing and Factory Mutual were within the ranges reported by NepRWA and NAWQA and below the acute and chronic water quality criteria.

Total Phosphorus (as P)

NepRWA total phosphorus concentrations ranged from 0.01 mg/L to 0.41 mg/L (n=56) with six samples greater than 0.1 mg/L. NAWQA total phosphorus concentrations ranged from 0.014 mg/L to 0.139 mg/L (n=28).

Hardness

Hardness reported by Factory Mutual ranged between 24 and 58 mg/L (n=10).

Chemistry- sediment

As part of the DEP 1994 survey, sediment chemical analyses were conducted at three stations (Crackrock Pond, Bird Pond and at Route 1 in Norwood) on this segment of the Neponset River. At Crackrock Pond several analytes (TP, TKN, Cd, Cr, Cu, Ni and Hg) exceeded the S-EL threshold, while lead exceeded the L-EL. At Bird Pond however, cadmium was not detected nor was it detected in the Neponset River sediments. Concentrations of Cu, As and Pb were greater than the S-ELs, while, Cr, Fe, and Mn were greater than the L-ELs. At the Route 1 station only Cd and Pd were greater than the L-ELs. It should be noted that the MDL for cadmium in 1994 was greater than the L-EL (Kennedy *et al.* 1995).

The headwaters of the Neponset River, Neponset Reservoir, received the treated process wastewater discharge from Foxborough Company for many years. This discharge has lead to the heavy metal contamination of the sediments in the reservoir. The May 1998 Phase I Investigation Report of the Neponset Reservoir found that cadmium and a number of other metals in sediments exceeded the Massachusetts Contingency Plan Stage I screening levels that are used to judge if there is potential for exposure (Menzie-Cura & Associates 2001). Because of these findings a Stage II Risk Characterization was performed. DEP approved the Phase II Comprehensive Site Assessment and environmental risk characterization in May of 1998. Through this work the specific constituents of concern were identified (metals, cyanide and volatile organic chemicals). Through four assessment endpoints and associated measurement endpoints the following conclusions were made:

- There was no physical evidence of a continuing release of oil and/or hazardous material to the surface waters which significantly affects Environmental Receptors
- There is no evidence of biologically significant harm associated with current or future exposure of wildlife, fish, shellfish or other aquatic biota to oil and/or hazardous material at or from the site.
- Concentrations of oil and/or hazardous material at or from the disposal site do not and are not likely to exceed any applicable environmental standards
- There is no indication of the potential for biologically significant harm either currently or in the future to Environmental Receptors considering their potential exposures to oil and/or hazardous material and the toxicity of oil and/or hazardous material

Currently, the Neponset Reservoir (DEP Site #4-0011387) is a Tier 1A, Phase II hazardous waste site.

The *Aquatic Life Use* for this segment of the Neponset River is assessed as support based on water quality, biology and ambient survival data from multiple stations. However, one-mile downstream of the Factory Mutual discharge is threatened due to whole effluent toxicity. This segment of the Neponset River is on "Alert Status" due to the possible negative impacts caused by elevated levels of total phosphorus and the historically high contaminant levels in the sediments of Neponset Reservoir and Crackrock Pond.

FISH CONSUMPTION

MDPH issued a fish consumption advisory for the Neponset River from the Hollingsworth and Vose Dam to the Tilestone Dam due to elevated levels of PCBs in fish tissue (MDPH 2001a). The MDPH advisory recommends the following:

1. Children younger than 12-years, pregnant women, and nursing mothers, should not consume any brown bullhead from the Neponset River.
2. The general public should limit consumption of brown bullhead from the Neponset River to two meals per month.

Based on the MDPH site-specific fish consumption advisory, from the Hollingsworth and Vose Dam downstream 4.70 miles, this segment is assessed as non-support for the *Fish Consumption Use.* The remaining 9.00 miles are currently not assessed.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

Between 1997 and 2001 NepRWA collected 68 fecal coliform bacteria samples at the six water quality stations along this segment of the Neponset River (NepRWA 1998, 1999, and 2001). Counts ranged from 0 to 2,300 cfu/100mL during both wet and dry weather conditions. Thirty samples were collected during the primary contact season (range 6 to 2,300 cfu/100mL) with three elevated above 400 cfu/100mL (one wet and two dry, all prior to 1999).

Since 1998, fecal coliform bacteria levels have not been elevated during dry weather conditions. Based on overall low bacteria counts the *Primary* and *Secondary Contact Recreational* uses are assessed as support.

AESTHETICS

NepRWA's water quality sampling indicated relatively low instream turbidity. Trash and debris, however, from road and storm water runoff were also identified from multiple locations (NepRWA 1998, 1999, and 2001). DWM field observations from the fall of 2001 revealed clumping mats of algae in Crackrock Pond (headwaters of this segment of the Neponset River).

The *Aesthetics Use* is assessed support for this segment of the Neponset River. However, this segment is on "Alert Status" due to trash and debris associated with urban runoff.

Neponset River (MA73-01) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life*		SUPPORT*				
Fish Consumption		NON-SUPPORT 4.7 miles NOT ASSESSED 9.0 miles	PCBs		Unknown	
Primary Contact		SUPPORT				
Secondary Contact		SUPPORT				
Aesthetics*		SUPPORT*				

*"Alert Status" issues identified- See *Aquatic Life* and *Aesthetics* use assessments

RECOMMENDATIONS NEPONSET RIVER (MA73-01)

- Factory Mutual (MA0005304) should continue to collect water from the Neponset River upstream of their discharge to use as dilution water in their whole effluent toxicity tests. If the river water does not meet the control test acceptability criteria (e.g., survival > 80% at 7-day), then Neponset River water must still be utilized as a test control and not as diluent. If toxicity test results continue to violate permit limits (frequency and severity of violations considered), a toxicity identification and reduction evaluation should be conducted.

- The DWM 1994 benthic macroinvertebrate surveys identified a moderately impacted benthic community. Conduct a biological survey on the Neponset River to determine if the improving water quality has made an impact on the biota.

- Continue to review the Neponset Reservoir clean up data and conduct additional sediment analyses (metals and toxicity) to determine if the historical contamination is currently impacting water quality and the biota downstream from the reservoir

- Continue to monitor pathogen levels in the Neponset River (including Norwood) to determine if the ongoing sewer and septic system repair projects are effective in reducing pathogen levels during wet and dry weather conditions.

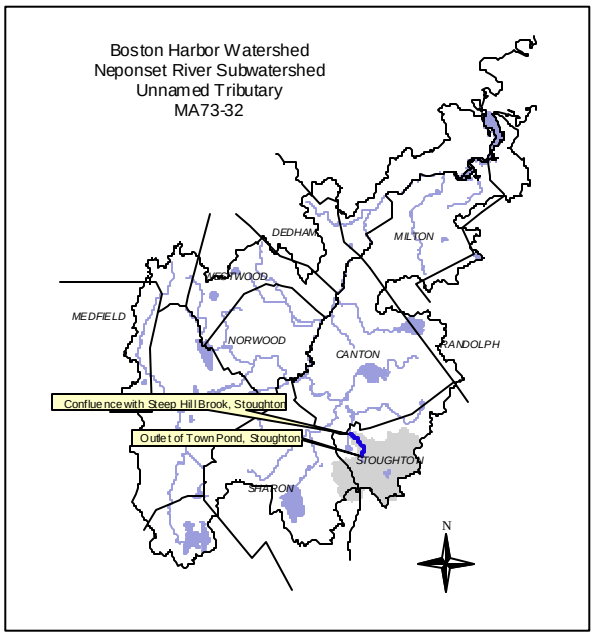
UNNAMED TRIBUTARY (SEGMENT MA73-32)

Location: From the outlet of Town Pond, Stoughton, to the confluence with Steep Hill Brook, Stoughton. (Locally known as Steep Hill Brook)
Segment Area: 1.0 mile.
Classification: Class B.

Land-use estimates for the subwatershed (map inset, gray shaded area):

Residential	55%
Forest	22%
Open Land	8%

The use assessment for Town Pond is provided in the Lakes section of this assessment report (Table 11).



WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)	1999 Average Withdrawal (MGD)
Stoughton DPW-Water Division	4285000	9P41928501	41928502	01G 02G 03G 04G 05G 06G	0.13 (permitted)* 1.08 (registered)*	Not available

***System-wide withdrawal**

NPDES DISCHARGE SUMMARY:

There are no regulated wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Biology

During July 1999 DEP DWM conducted benthic macroinvertebrate and fish population studies at station SB01, downstream from Central Street, Stoughton. SB01 was “slightly impacted” when compared to both the warm (NE09) and cold (5B01) water reference stations. The dominant species were filter-feeding caddisflies, which indicates a large amount of suspended fine particulate organic matter in this portion of the stream (Appendix C).

The fish species present during the 1999 DWM biological survey, in order of abundance, included pumpkinseed (*L. gibbosus*), largemouth bass (*M. salmoides*), white sucker (*C. commersoni*), chain pickerel (*E. niger*), and American eel (*A. rostrata*) (Appendix C).

Habitat

As part of DEP DWM's 1999 benthic macroinvertebrate and fish population studies at station SB01 a habitat survey was conducted (Appendix C). Optimal benthic macroinvertebrate habitat was identified in the sampling reach; however, a small section of the streambank was channelized and some evidence of streambank erosion was noted.

Chemistry – water

NepRWA conducted bimonthly water quality monitoring in an unnamed tributary (locally known as Steep Hill Brook) at Central and West Streets, SHB021 from 1999 to 2001 (NepRWA 1999 and 2001a and b). Water quality samples were analyzed for DO, temperature, pH, total suspended solids, ammonia, and total phosphorus (as P). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature

All temperature measurements (n=6) were below the SWQS for a Class B waterbody.

pH

pH readings ranged between 6.4 and 7.0 SU (n=7) with two measurements less than 6.5 SU.

Total Suspended Solids

TSS concentrations (n=10) ranged between BDL and 26 mg/L with only one sample greater than 25 mg/L.

Ammonia-Nitrogen (as N)

Ammonia concentrations ranged between 0.030 and 0.122 mg/L (n=11). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged between 0.02 and 0.092 mg/L (n=11) with five samples greater than 0.05 mg/L

Based on the slightly degraded water quality (elevated nutrients, and low pH) and a slightly impacted benthic community, the *Aquatic Life Use* is assessed as partial support.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

Fecal coliform bacteria sampling in this unnamed tributary was conducted by NepRWA in conjunction with water quality monitoring (NepRWA 1999 and 2001a and b). Fecal coliform levels ranged between 6 and 310 cfu/100mL (n=11). Samples were collected during both wet and dry weather sampling conditions.

The *Primary* and *Secondary Contact Recreational* uses are assessed as support for this mile long segment based on the low fecal coliform bacteria counts.

AESTHETICS

During the July 1999 DWM biology survey localized trash and debris, probably originating from the adjacent shopping area parking lot, was identified (Appendix C). There was no additional evidence of objectionable conditions (odors, and/or oils). NepRWA's water quality sampling indicated relatively low instream turbidity with good water clarity (NepRWA 1999 and 2001a and b).

Based on the high aesthetic quality of this brook the *Aesthetics Use* is assessed as support.

Unnamed Tributary (MA73-32) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		PARTIAL SUPPORT	Unknown, nutrients, pH		Unknown	
Fish Consumption		NOT ASSESSED				
Primary Contact		SUPPORT				
Secondary Contact		SUPPORT				
Aesthetics		SUPPORT				

RECOMMENDATIONS UNNAMED TRIBUTARY (MA73-32)

- Work with NepRWA and local residents to remove trash and debris and prevent future dumping from the shopping area parking lot.

- Conduct citizen outreach education workshops to educate local residents and landowners about good stream stewardship (i.e., yard waste disposal practices, reduction of impervi ous surfaces, and erosion controls).

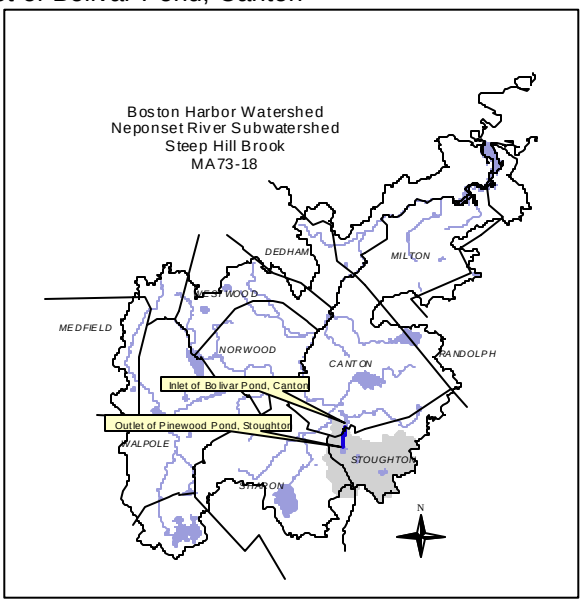
STEEP HILL BROOK (SEGMENT MA73-18)

Location: Outlet of Pinewood Pond, Stoughton, to the inlet of Bolivar Pond, Canton
Segment Area: 1.0 mile.
Classification: Class B.

Land-use estimates for the subwatershed (map inset, gray shaded area):

Residential	56%
Forest	23%
Open Land	8%

The use assessments for Pinewood and Woods ponds are provided in the Lakes section of this assessment report (Table 11).



WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)	1999 Average Withdrawal (MGD)
Stoughton DPW-Water Division	4285000	9P41928501	41928502	08G	0.13 (permitted)* 1.08 (registered)*	Not available

*System-wide withdrawal

NPDES DISCHARGE SUMMARY:

There are no regulated wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

Steep Hill Brook (MA73-18) Use Summary Table

Aquatic Life	Fish Consumption	Primary Contact	Secondary Contact	Aesthetics
				
Not Assessed				

RECOMMENDATIONS STEEP HILL BROOK (MA73-18)

- Work with NepRWA and local residents to remove trash and debris and prevent future dumping in the Steep Hill Brook Subwatershed.

- Conduct citizen outreach education workshops to educate local residents and landowners about good stream stewardship (i.e., yard waste disposal practices, reduction of impervious surfaces, and erosion controls).

BEAVER MEADOW BROOK (SEGMENT MA73-20)

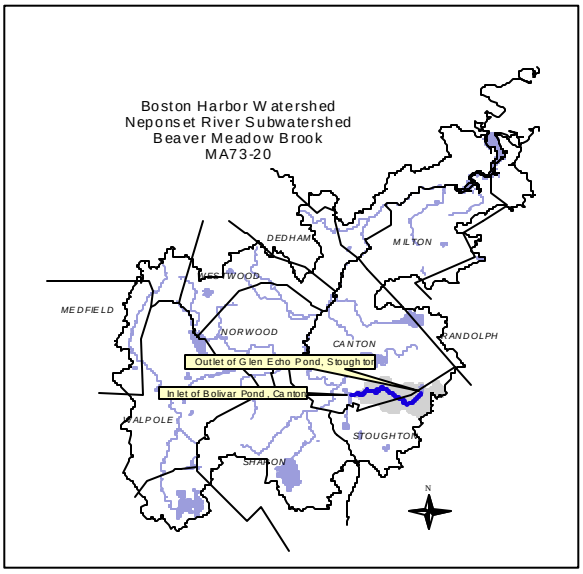
Location: Outlet of Glenn Echo Pond, Stoughton, to the inlet of Bolivar Pond, Canton.
Segment Area: 3.3 miles.
Classification: Class B.

Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	45%
Residential	31%
Industrial	11%

This segment is on the 1998 303(d) list of impaired waters for organic enrichment/ low DO and pathogens (MA DEP 1999a).

The use assessment of Glen Echo and Bolivar ponds are provided in the Lakes section of this assessment report (Table 11).



WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)*	1999 Average Withdrawal (MGD)
Town of Canton	3050000			03G	1.0	0.62

* System-wide withdrawal

NPDES DISCHARGE SUMMARY:

There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Biology

During July 1999 DEP DWM conducted benthic macroinvertebrate and fish population studies at station BM01, downstream from Pine Street, Canton (Appendix C). Station BM01 was 88% comparable to the warm water reference station NE09 (i.e., "non-impacted"). When compared to the cold water reference station, the BM01 benthic community was only 63% comparable (i.e., "slightly impacted"). However, this slight impact was the result of the trophic structure, which was skewed towards filter-feeders.

Fish species present in order of abundance included brown bullhead (*A. nebulosis*), white sucker (*C. commersoni*), largemouth bass (*M. salmoides*), American eel (*A. rostrata*), pumpkinseed (*L. gibbosus*), darter (*E. olmstedi*), yellow perch (*P. flavescens*), redfin pickerel (*E. americanus*), and golden shiner (*N. crysoleucas*).

Habitat/Flow

As part of DEP DWM's 1999 benthic macroinvertebrate and fish population studies at station BM01 a habitat survey was conducted (Appendix C). Reduced baseflow was noted during spring reconnaissance. During the July sampling event baseflow had returned to normal. The increased flows were probably associated with recent rain events. Optimal fish and benthic macroinvertebrate habitat was identified in the sampling reach; however, a very small section of the streambank was channelized.

NepRWA has identified low baseflows in Beaver Meadow Brook and has noted houses and an apartment complex pumping water directly out of the brook to water yards and gardens (NepRWA 2002).

Chemistry – water

NepRWA conducted bimonthly water quality monitoring in Beaver Meadow Brook at Pine Street (BMB026) from 1999 to 2001 (NepRWA 1999 and 2001a and b). Water quality samples were analyzed for DO, temperature, pH, total suspended solids, ammonia, and total phosphorus. Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature

All temperature measurements (n=6) were below the SWQS for a Class B waterbody.

pH

pH ranged between 6.6 and 7.3 SU (n=6).

Total Suspended Solids

TSS concentrations ranged between BDL and 8 mg/L (n=10).

Ammonia-Nitrogen (as N)

Ammonia concentrations ranged between 0.020 and 0.108 mg/L (n=10). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged between 0.031 and 0.07 mg/L (n=10) with four samples greater than 0.05 mg/L.

Based on the overall high water quality (temperature, pH, and TSS), the non- to slightly impacted benthic community and land-use information, the *Aquatic Life Use* is assessed as support for the entire 3.3 miles of Beaver Meadow Brook.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

NepRWA conducted fecal coliform bacteria sampling (n=10) in Beaver Meadow Brook in conjunction with water quality monitoring between 1999 and 2001 (NepRWA 1999 and 2001a and b). Fecal coliform bacteria counts ranged between 3 and 970 cfu/100mL. During the primary contact season (n=6), bacteria counts ranged between 108-950 cfu/100ml, with only one count greater than 400 cfu/100mL. This one high count was collected during wet weather.

Based on the low fecal coliform bacteria counts, the *Primary* and *Secondary Contact Recreational* uses are assessed as support.

AESTHETICS

During the July 1999 DWM biology survey localized trash and debris, probably originating from the adjacent apartment complex, was identified (Appendix C). During the DEP DWM 1999 survey the water column appeared turbid, however, on the day preceding sampling, over half an inch of rain fell across the subwatershed. NepRWA's water quality sampling data indicated relatively low instream turbidity (NepRWA 1999 and 2001a and b). Trash and debris from road and storm water runoff were also identified (NepRWA 2002).

The *Aesthetics Use* is assessed as support. However, this segment is on "Alert Status" due to trash and debris from urban runoff.

Beaver Meadow Brook (MA73-20) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		SUPPORT				
Fish Consumption		NOT ASSESSED				
Primary Contact		SUPPORT				
Secondary Contact		SUPPORT				
Aesthetics*		SUPPORT*				

* "Alert Status" issues identified –See *Aesthetics Use* Assessment

RECOMMENDATIONS BEAVER MEADOW BROOK (MA73-20)

- Work with NepRWA to conduct a stream clean up to remove trash and debris in the Beaver Meadow Brook Subwatershed.

- Work with NepRWA to conduct a citizen outreach education workshop to educate local residents and landowners about good stream stewardship (i.e. yard waste disposal practices, reduction of impervious services, and erosion controls).

- Investigate possible sources of reduced baseflow in Beaver Meadow Brook including the impacts of water supplies, non-permitted withdrawals, and sewer infiltration and inflow.

BEAVER BROOK (SEGMENT MA73-19)

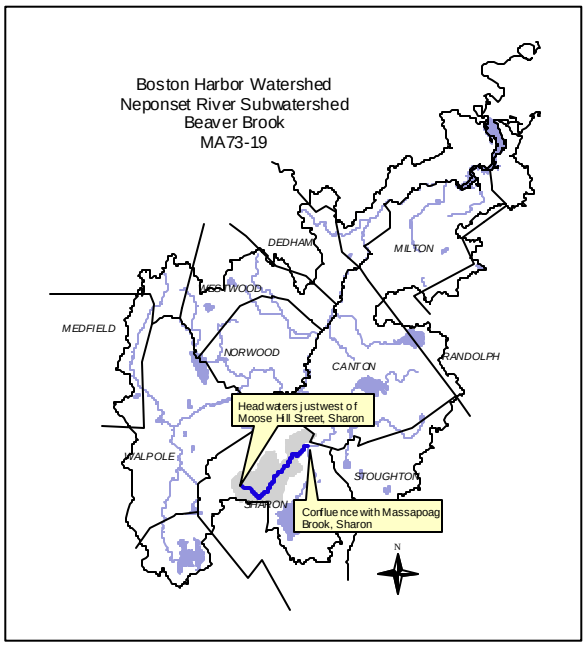
Location: Headwaters just west of Moose Hill Street, Sharon, through Sawmill Pond, to confluence with Massapoag Brook, Sharon.
Segment Area: 3.5 miles.
Classification: Class B.

Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	58 %
Residential	27%
Open Land	7%

This segment is on the 1998 303(d) list of impaired waters for organic enrichment/ low DO (MA DEP 1999a).

In 2001, DFWELE stocked trout in Beaver Brook for the purpose of recreational fishing (DFWELE 15 March 2001).



WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)	1999 Average Withdrawal (MGD)
Sharon Water Department	4266000	9P41926601	41926603	01G 02G 03G	0.42 permitted 0.55 registered	Not available

SURFACE NPDES DISCHARGE SUMMARY:

There are no regulated wastewater discharges to this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Biology

During July 1999, DEP DWM conducted benthic macroinvertebrate sampling at BB01, downstream from Mascwonicut Street, Sharon (Appendix C). The benthos assemblage was 82% comparable to the warm-water reference community at NE09 (i.e., “non/slightly impacted”). The taxa richness was the highest of all the Boston Harbor biomonitoring stations suggesting good diversity and a community dominated by pollution-sensitive species. When compared to the cold water reference station, BB01 was “slightly impacted”. However, several of the benthic macroinvertebrate metrics scored better than, or as good as, the cold water reference station.

The fish community at the Beaver Brook sampling location contained a total of only four fish: brown trout (*S. trutta*), white sucker (*C. commersoni*), largemouth bass (*M. salmoides*), and redfin pickerel (*E. americanus*). It is unclear as to why fish were largely absent from this sampling reach (Appendix C).

Habitat

As part of DEP DWM's 1999 benthic macroinvertebrate and fish population studies at station BB01 a habitat survey was conducted (Appendix C). Optimal benthic macroinvertebrate and fish habitat was identified in the sampling reach. Several midge species in the benthic samples, however, were considered tolerant of low flow conditions. Additionally, it is possible that episodic low flow events may be responsible for the low numbers of fish due to reduced/impaired habitat conditions.

Chemistry – water

NepRWA conducted bimonthly water quality monitoring in Beaver Brook at Upland Street (BEB013) from 1999 to 2001(NepRWA 2001a and b). Water quality samples were analyzed for dissolved oxygen, temperature, pH, total suspended solids, ammonia, and total phosphorus (as P). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature

All temperature measurements were below the SWQS for a Class B waterbody (n=6).

pH

pH ranged between 6.5 and 7.0 SU (n=6).

Total suspended solids

TSS concentrations ranged between BDL and 4 mg/L (n= 10).

Ammonia-Nitrogen (as N)

Ammonia concentrations ranged between 0.005 and 0.032 mg/L (n=10). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged between 0.01 and 0.063 mg/L with two samples greater than 0.05 mg/L (n=10).

Beaver Brook is assessed as partial support based on a slightly impacted benthic community, low fish densities and suspected low flows (despite excellent fish habitat).

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

Fecal coliform bacteria sampling (n=10) in Beaver Brook was conducted by NepRWA in conjunction with water quality monitoring between 1999 and 2001 (NepRWA 2001a and b). Fecal coliform bacteria counts ranged between 3 and 140 cfu/100mL. Samples were collected during both wet and dry weather conditions. During the primary contact season, bacteria counts ranged between 4 and 140cfu/100mL (n=6). It should be noted that the Town of Sharon is served entirely by on-site septic systems.

The *Primary* and *Secondary Contact Recreational* uses are assessed as support based on low fecal coliform bacteria counts during both wet and dry weather.

AESTHETICS

Minimal nonpoint sources of pollution (railroad tracks and road crossings) were identified during the July 1999 DWM biology survey (Appendix C). There was no evidence of objectionable conditions (i.e., odors, trash and debris, oils). NepRWA's water quality sampling indicated relatively low instream turbidity with good water clarity (NepRWA 2001a and b).

Based on the high aesthetic quality of Beaver Brook the *Aesthetics Use* is assessed as support.

Beaver Brook (MA73-19) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		PARTIAL SUPPORT	Unknown	Low flow	Unknown	
Fish Consumption		NOT ASSESSED				
Primary Contact		SUPPORT				
Secondary Contact		SUPPORT				
Aesthetics		SUPPORT				

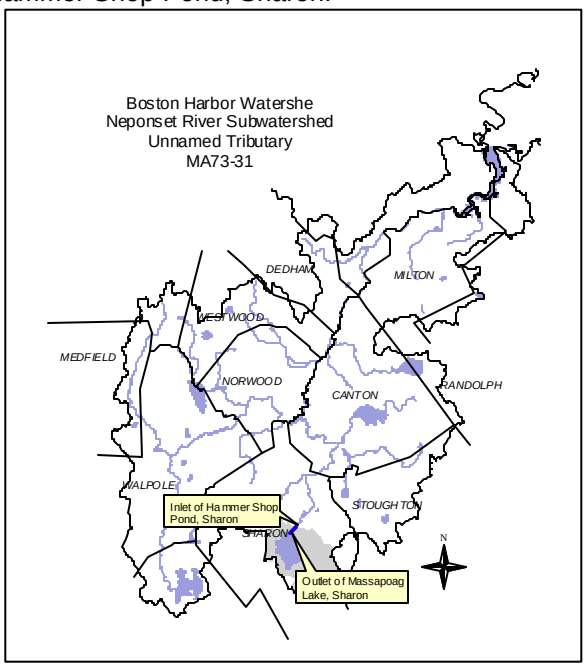
RECOMMENDATIONS BEAVER BROOK (MA73-19)

- Investigate possible sources of reduced baseflow in Beaver Meadow Brook including the impacts of water supplies, private water use, and sewer infiltration and inflow.

- Conduct a fish population survey to investigate the possible reasons for the low densities of fish in this brook.

UNNAMED TRIBUTARY (SEGMENT MA73-31)

Location: Outlet of Massapoag Lake, Sharon to inlet of Hammer Shop Pond, Sharon.
Segment Area: 0.2 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	43%
Residential	33%
Open Land	6%

The use assessment for Lake Massapoag is provided in the Lakes section of this assessment report (Table 11). A lake management strategy, recommended by the Lake Management Committee and adopted by the Sharon Selectmen, is to control the lake's surface water temperature. This thermally stratified lake typically has summer surface temperatures at or below 83°F. The Town determined that blue green algae responsible for swimmers' ear infections begin to thrive at 85ºF. Discharge from the lake is regulated in the summer months to reduce surface temperatures for human health concerns. The Town is required to release 1.7 cfs from the lake for protection of downstream wetlands (ACOE 1998).

WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)	1999 Average Withdrawal (MGD)
Sharon Water Department	4266000	9P41926601	41926603	01G 02G 03G	0.42 permitted 0.55 registered	Not available

SURFACE NPDES DISCHARGE SUMMARY:

There are no wastewater discharges to this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Habitat/Flow

The Town of Sharon has municipal groundwater wells abutting Lake Massapoag. These wells have historically resulted in reduced outflow from the lake which subsequently reduced flows downstream (NepRWA 2001b).

Chemistry – water

NepRWA conducted bimonthly water quality monitoring in this unnamed tributary at one station (the outlet of Lake Massapoag, MPB009) from 1999 to 2001 (NepRWA 2001a and b). Water quality samples were analyzed for pH, temperature total suspended solids, ammonia, and total phosphorus. Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature
All temperature measurements (n=6) were below the SWQS for a Class B waterbody.

pH
pH ranged between 6.6 and 7.6 SU (n=6).

Total Suspended Solids
TSS concentrations ranged between 1 and 10.5 mg/L (n=11).

Ammonia-Nitrogen (as N)
Ammonia concentrations ranged from BDL to 0.03 mg/L (n=11). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)
Total phosphorus concentrations ranged from 0.01 to 0.118 mg/L (n=11) with two samples greater than 0.05 mg/L.

Too little instream data were available to assess the *Aquatic Life Use*; therefore, it is not assessed.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

NepRWA conducted fecal coliform bacteria sampling between 1999 and 2001 in conjunction with water quality monitoring (NepRWA 1999 and 2001a and b). Fecal coliform bacteria counts (n=11) ranged between 3 and 490 cfu/100mL with only one count greater than 400 cfu/100mL (collected during wet weather conditions). Samples were collected during both wet and dry weather conditions. During the primary contact season fecal coliform bacteria counts ranged between 10 and 490 cfu/100mL (n=6). It should be noted that the Town of Sharon is served mainly (approximately 97%) by on-site septic systems.

Based on the low fecal coliform bacteria counts during wet and dry weather conditions, the *Primary* and *Secondary Contact Recreational* uses are assessed as support.

AESTHETICS

NepRWA's water quality sampling indicated relatively low instream turbidity with good water clarity and high aesthetic value (NepRWA 1999 and 2001a and b).

Based on the high aesthetic quality of this brook the *Aesthetics Use* is assessed as support.

Unnamed Tributary (MA73-31) Use Summary Table

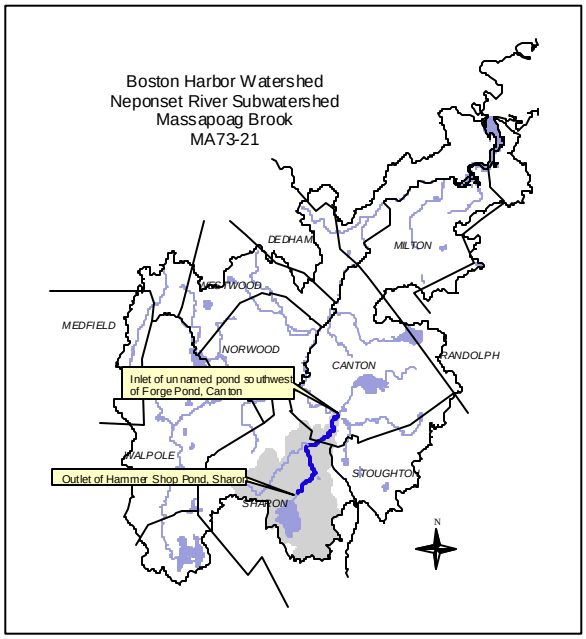
Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		NOT ASSESSED				
Fish Consumption		NOT ASSESSED				
Primary Contact		SUPPORT				
Secondary Contact		SUPPORT				
Aesthetics		SUPPORT				

RECOMMENDATIONS UNNAMED TRIBUTARY (MA73-31)

- Investigate possible causes of reduced baseflow in the Massapoag subwatershed including the impacts of water withdrawal and sewer infiltration and inflow.

MASSAPOAG BROOK (SEGMENT MA73-21)

Location: Outlet Hammer Shop Pond, Sharon, through Manns Pond, Trowel Shop Pond, and Shepard Pond to the inlet of unnamed pond southwest of Forge Pond, Canton.
Segment Area: 4.0 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	44%
Residential	37%
Open Land	7%

This segment is on the 1998 303(d) list of impaired waters for unknown causes (MA DEP 1999a). In 2001, DFWELE stocked trout in Massapoag Brook for the purpose of recreational fishing (DFWELE 15 March 2001). Hammershop Pond Dam, Knifeshop Pond Dam, Manns Pond Dam, Trowel Shop Pond Dam, and Shepard Pond Dam are located along this segment. Additional information on dams in Massachusetts may be obtained from MA DEM at http://www.state.ma.us/dem/ and a MassGIS datalayer showing the location of dams in Massachusetts will soon be available at: http://www.state.ma.us/dem/programs/gis/de%5Fdl.htm. The use assessments for Hammer Shop, Manns, and Billings Street/East ponds are provided in the Lakes section of this assessment report (Table 11).

WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)	1999 Average Withdrawal (MGD)
Sharon Water Department	4266000	9P41926601	41926603	01G 02G 03G	0.42 permitted 0.55 registered	Not available

The Town of Sharon has municipal groundwater wells abutting Lake Massapoag. These wells have historically resulted in reduced outflow from the lake subsequently reducing flows downstream (NepRWA 1998).

SURFACE NPDES DISCHARGE SUMMARY:

There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Biology

During July 1999, DEP DWM conducted benthic macroinvertebrate and fish population sampling at station 9BOB, downstream from Manns Pond, Sharon (Appendix C). Despite the excellent habitat the benthic community was only 59% comparable to the warm-water reference station (i.e., "slightly

impacted"). The community was dominated by relatively few taxa—most notably, the net-spinning caddisflies Hydropsychidae and Philopotamidae--indicating an unbalanced community responding to an overabundance of fine particulate organic matter (FPOM) in the water column.

The 1999 fish population at 9BOB was dominated (80%) by "pond" species including: brown bullhead (*Ameiurus nebulosus*), bluegill (*L. macrochirus*), and pumpkinseed (*L. gibbosus*). Additionally, largemouth bass (*M. salmoides*), golden shiner (*Notemigonus crysoleucas*), white sucker (*C. commersoni*) and American eel (*A. rostrata*) were also collected. The fish community at 9BOB was clearly influenced by upstream impoundments.

NepRWA conducted benthic macroinvertebrate sampling twice (October and November) during their 1999 monitoring efforts in Massapoag Brook (Berasi and Harrahy 2001). The biomonitoring station (MAB5-C) was located downstream from Quincy Street in Sharon—approximately 1.75 km upstream from DWM's 9BOB station. As with the 9BOB station, filter-feeding caddisflies dominated the benthic assemblage on both dates here--hydropsychids being particularly hyperdominant, with mean percent compositions of 94% and 82% respectively. Thus, the same impoundment effects thought to shape benthic community structure at 9BOB occur at MAB5-C as well. Massapoag Lake, located immediately upstream from MAB5-C, clearly provides a major source of FPOM for filter-feeding dominated communities such as MAB5-C and elsewhere in this portion of Massapoag Brook.

Habitat/Flow

Significant deposits of FPOM were observed on much of the instream substrates; however, this benthic sampling site received the highest habitat score of any site in the Boston Harbor Watershed (Appendix C). Immediately upstream of this station is Manns Pond, a eutrophic pond containing dense non-native macrophytes.

ACOE states that during low flow conditions, flows in Massapoag Brook are diverted above Third Pond via a watershed saddle channel to Clay Meadow Brook, which drains to Steep Hill Brook and then into Bolivar Pond (ACOE 1998).

Chemistry – water

NepRWA conducted bimonthly water quality monitoring in Massapoag Brook at Walnut Street (MPB088) from 1999 to 2001. Water quality samples were analyzed for DO, pH, temperature total suspended solids, ammonia, and total phosphorus (NepRWA 2001a and b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature

All temperature measurements were below the SWQS for a Class B waterbody (n=7).

pH

pH ranged between 6.5 and 7.3 SU (n=6).

Total Suspended Solids

TSS concentrations ranged between BDL and 19 mg/L (n=8).

Ammonia-nitrogen (as N)

Ammonia concentrations ranged between 0.005 and 0.052 mg/L (n=8). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged between 0.026 and 0.140mg/L (n=9) with four measurements greater than 0.05 mg/L.

The *Aquatic Life Use* for Massapoag Brook is assessed as partial support based on slightly impacted biological communities (benthic macroinvertebrates dominated by filter-feeders at 9BOB and MAB5-C, and fish assemblage dominated by pond species at 9BOB) and slightly elevated nutrients.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

Fecal coliform bacteria sampling in Massapoag Brook was conducted by NepRWA in conjunction with water quality monitoring at one site (at Walnut Street) (NepRWA 2001a and b). Fecal coliform bacteria counts ranged between 22 and 480 cfu/100mL (n=9). One out of the nine samples had a concentration above 400 cfu/100mL. This sample was collected during wet weather conditions. During the primary contact recreation season five samples were collected (40 to 181 cfu/100mL). It should be noted that the Town of Sharon is served mainly (approximately 97%) by on-site septic systems.

The *Primary* and *Secondary Contact Recreational* uses are assessed as support for Massapoag Brook based on the low levels of fecal coliform bacteria during both wet and dry weather conditions.

AESTHETICS

There was no evidence of objectionable conditions noted during the 1999 DWM biomonitoring survey (i.e., odors, trash and debris, oils) (Appendix C). NepRWA's water quality sampling indicated relatively low instream turbidity with good water clarity (NepRWA 2001a and b).

Based on the high aesthetic quality of Massapoag Brook the *Aesthetics Use* is assessed as support.

Massapoag Brook (MA73-21) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		PARTIAL SUPPORT	Unknown, nutrients	Low flows	Unknown	
Fish Consumption		NOT ASSESSED				
Primary Contact		SUPPORT				
Secondary Contact		SUPPORT				
Aesthetics		SUPPORT				

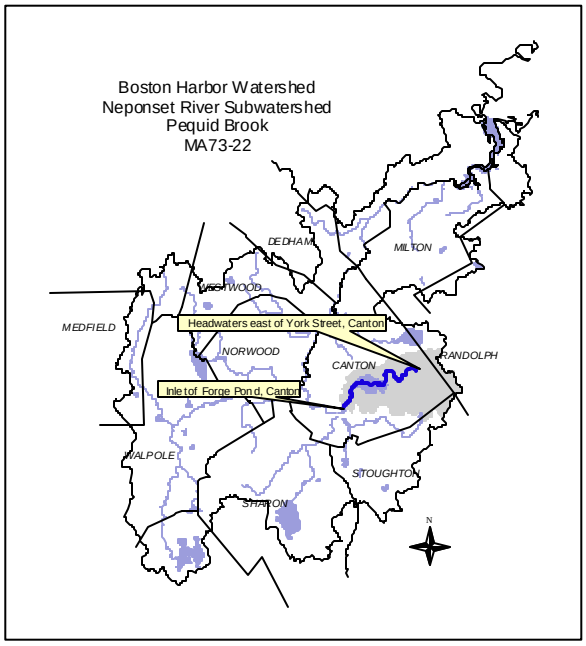
RECOMMENDATIONS MASSAPOAG BROOK (MA73-21)

- Investigate possible sources of reduced baseflow in the Massapoag subwatershed including the impacts of reservoir management practices and sewer infiltration and inflow.

- Work with ACOE, DFWELE, and NepRWA to determine the feasibility of dam removal on man-made impoundments on Massapoag Brook.

PEQUID BROOK (SEGMENT MA73-22)

Location: Headwaters east of York Street, Canton, through Reservoir Pond, to the inlet of Forge Pond, Canton. (Locally known as Pequit Brook)
Segment Area: 3.8 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	42%
Residential	28%
Open Land	9%

This segment is on the 1998 303(d) list of impaired waters for organic enrichment/ low DO, and pathogens (MA DEP 1999a). The Reservoir Pond Dam is located within this segment. It is maintained by the Plymouth Rubber Company (ACOE 1998).

WMA WATER WITHDRAWAL AND SURFACE NPDES DISCHARGE SUMMARY:

There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Biology

During July 1999, DEP DWM conducted benthic macroinvertebrate and fish population studies at station PB01, approximately 0.50 miles upstream from Sherman Street, Canton. This station was 88% comparable (i.e., "non-impacted") to the warm-water reference station at Hawes Brook (Appendix C). Station PB01 displayed optimum benthic community structure and well-balanced trophic structure with some of the highest diversity in the Neponset River subwatershed. However, species (P*arametriocnemus sp.)* often associated with low flows were present in the benthic community. Fish species present in order of abundance included: largemouth bass (*M. salmoides*), black crappie (*Pomoxis nigromaculatus*), brown bullhead (*A. nebulosus*), bluegill (*L. macrochirus*), redfin pickerel (*E. americanus*), white sucker (*C. commersoni*), and American eel (*A. rostrata*). The fish assemblage was influenced by upstream and downstream impoundments and possible periodic low flow events.

As part of the benthic macroinvertebrate sampling phase of BUDGETS, NepRWA conducted biomonitoring at two stations on Pequid Brook in 1999 (PEB5-A and PEB5-B). PEB5-A was located downstream of York Street in Canton—the upper extent of this segment. Overall macroinvertebrate densities were low here. Isopods--generally considered tolerant of organic pollution and low dissolved oxygen levels--dominated the benthos during three rounds of sampling between August 1999 and August 2000. As a result, the PEB5-A macroinvertebrate community was characterized by low overall richness, a high biotic index, and reduced trophic structure. Instream habitat constraints and dissolved oxygen deficiencies associated with the wetland-oriented nature of this low-gradient portion of Pequid Brook, as well as naturally unproductive headwater conditions may account for the low macroinvertebrate density and richness (Berasi and Harrahy 2001).

Habitat/Flow

As part of DEP DWM's 1999 benthic macroinvertebrate and fish population studies at station PB01 a habitat survey was conducted (Appendix C). Optimal benthic macroinvertebrate and fish habitat was identified in the sampling reach.

Pequid Brook discharges to the northern lobe of Lower Forge Pond via a conduit through a commuter rail embankment (ACOE 1998).

Chemistry – water

NepRWA conducted bimonthly water quality monitoring in Pequid Brook at Sherman Street (PQB040) from 1999 to 2001. Water quality samples were analyzed for DO, pH, temperature total suspended solids, ammonia, and total phosphorus (NepRWA 2001a and b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature

All temperature measurements were below the SWQS for a Class B waterbody (n=6).

pH

pH ranged between 6.6 and 7.0 SU (n=7)

Total Suspended Solids

TSS concentrations ranged between BDL and 7 mg/L (n=10)

Ammonia-nitrogen (as N)

Ammonia concentrations ranged between 0.004 and 0.074 mg/L (n=11). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged between 0.028 and 0.07 mg/L (n=11) with only two samples greater than 0.05 mg/L.

Based on healthy benthic and fish communities at PB01, high habitat quality, landuse information and good overall water chemistry the *Aquatic Life Use* for Pequid Brook is assessed as support. Pequid Brook is, however, on "Alert Status" due to periodic low base flow, possibly the result of flow regulation at the various impoundments, and a potentially impaired benthic community at PEB5-A.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

Fecal coliform bacteria sampling in Pequid Brook was conducted by NepRWA in conjunction with water quality monitoring (NepRWA 2001a and b). Fecal coliform levels ranged between 11 and 440 cfu/100mL (n=11) with six samples collected during the primary contact recreation season (range 160 to 440 cfu/100mL). The one count greater than 400 cfu/100mL was collected during mixed/wet weather conditions.

The *Primary* and *Secondary Contact Recreational* uses are assessed as support for Pequid Brook based on the low levels of fecal coliform bacteria during both wet and dry weather conditions.

AESTHETICS

This stream was noted to have high aesthetic quality with no evidence of non-point source pollution and no objectionable conditions (i.e., odors, trash and debris, oils) during the 1999 DWM biology survey (Appendix C). NepRWA's water quality sampling indicated relatively low instream turbidity with good water clarity (NepRWA 2001a and b).

Based on the high aesthetic quality of Pequid Brook the *Aesthetics Use* is assessed as support.

Pequid Brook (MA73-22) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life*		SUPPORT*				
Fish Consumption		NOT ASSESSED				
Primary Contact		SUPPORT				
Secondary Contact		SUPPORT				
Aesthetics		SUPPORT				

* "Alert Status" issues identified – See *Aquatic Life Use* Assessment

RECOMMENDATIONS PEQUID BROOK (MA73-22)

- Continue to monitor and evaluate summer instream water temperatures from Pequid Brook to determine if high water temperatures documented by ACOE in the 1998 Use Attainability Study at the outlet of Reservoir Pond and throughout the East Branch Neponset River subwatershed persist.

- Investigate water release practices in this subwatershed and establish if they may be affecting summer seasonal low flows.

- Water quality (DO, pH, temperature, total suspended solids, ammonia, and total phosphorus) monitoring is recommended upstream from Reservoir Pond to better assess potential impacts to the benthic macroinvertebrate community in this portion of Pequid Brook.

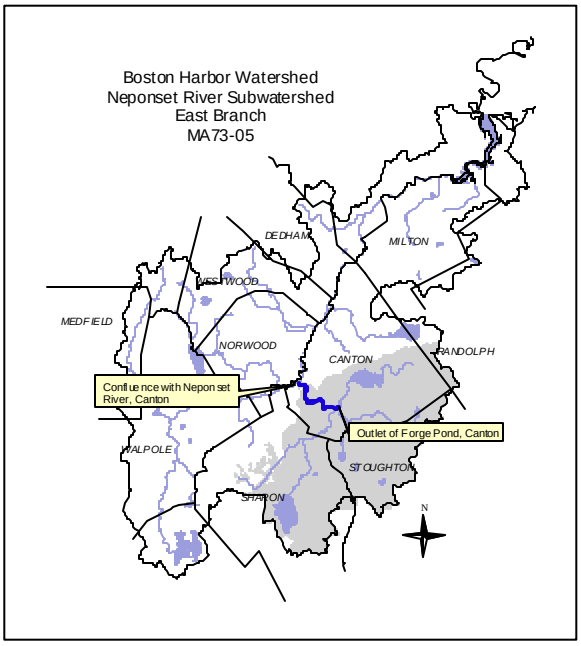
EAST BRANCH NEPONSET RIVER (SEGMENT MA73-05)

Location: Outlet of Forge Pond, Canton, through unnamed pond southwest of Forge Pond and East Branch Pond, to confluence with Neponset River, Canton (locally known as Canton River)
Segment Area: 3.2 miles.
Classification: Class B.

Land-use estimates for the subwatershed (map inset, gray shaded area):

Residential	40%
Forest	37%
Open Land	7%

This segment is on the 1998 303(d) list of impaired waters for cause unknown, metals, thermal modifications, flow alterations, and pathogens (MA DEP 1999a). Forge Pond Dam is located along the East Branch Neponset River (ACOE 1998).



WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)*	1999 Average Withdrawal (MGD)
Canton Water Department	3050000	9P31905001		10G 05G 04G	1.26	0.62
Canton Water Department	3050000	9P31905001		09G	See NOTE below	
Plymouth Rubber Co., Inc.			31905003	River	2.39	0.37
Stoughton DPW-Water Division	4285003			01G 02G 03G	Not available	Not available

NOTE: The Town of Canton WMA permit, newly issued November 2000, includes conditions from the District's Interbasin Transfer Approval to maintain instream flow and provide protection for the aquatic life in the Neponset River. The limits include (LeVangie 2001):

1) withdrawal from Well #9 is limited to the periods and streamflow thresholds as follows: (Nov. 16- March 14) 0.28 cubic feet per second per square mile (cfsm), (March 15- June 15) 0.81 cfsm, (June 16 – Sept. 14) 0.28 cfsm, (Sept. 15 – Nov. 15) 0.45 cfsm;
2) no withdrawals from the Well # 9 between March 15 and June 15 when the flow in the Neponset River is less than one foot in depth or 100 cfs below the Milton Lower Falls Dam;
3) Canton shall install a staff gage near the Dedham-Westwood Fowl Meadow Well to provide information on water depth; and
4) the Water District will submit annual reports detailing gage readings and volumes pumped from the Fowl Meadow Well.

NPDES DISCHARGE SUMMARY:

Plymouth Rubber (MA0000884) is permitted to discharge 2.6 MGD of NCCW via outfalls 002-007 and storm water via outfall 001 to the East Branch Neponset River. The facility's permit includes a TSS limit of 50 mg/L and requires a SWPPP. The permit expired October 2001. The facility has installed cooling

towers and no longer discharges NCCW. EPA is currently evaluating the need for a NPDES permit and may instead require the facility to obtain a general storm water permit (Hogan 2001).

All communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Biology

During July 1999 DEP DWM conducted benthic macroinvertebrate and fish population studies at station: NE12, downstream from Neponset Street, Canton (Appendix C). The benthos assemblage at this station was only 53% comparable to the warm-water reference station. The "slightly/moderately impacted" status was the poorest received by a Neponset River subwatershed biomonitoring station during the 1999 survey (Appendix C). The unbalanced assemblage was dominated by pollution tolerant filter-feeding taxa and indicated high levels of FPOM in the sampling reach.

Fish sampling efficiency at this station was rated poor due to fast, deep, and turbid water (Appendix C). Fish species present in order of abundance included fallfish (*Semotilus corporalis*), redbreasted sunfish (*L. auritus*), American eel (*A. rostrata*), bluegill (*L. macrochirus*), black crappie (*P. nigromaculatus*), yellow bullhead (*Ameiurus natalis*), largemouth bass (*M. salmoides*), and spottail shiner (*Notropis hudsonius*). Overall numbers of fish were very low (n=36) and were consistent with the 1994 DEP fish survey conducted under similar conditions at this station.

Habitat/Flow

As part of DEP DWM's 1999 benthic macroinvertebrate and fish population studies at station PB01 a habitat survey was conducted (Appendix C). Good instream benthic macroinvertebrate and fish habitat was identified in the sampling reach, however much of the sampling reach is channelized and a portion of the "rip-rapped" section was deteriorating, resulting in erosion and bank instability. Additionally, significant deposits of FPOM were observed on much of the instream substrates.

As part of the *Use Attainability Study of the East Branch Neponset River Canton, Stoughton, and Sharon Massachusetts*, ACOE determined that low flows (<10 cfs) during the summer months are common. ACOE notes that about 3% of the homes in Sharon and 70% of the houses in Canton are sewered. The wastewater is processed by the MWRA Deer Island WWTP and is transferred out of the subbasin (ACOE 1998). Additionally, flow in the East Branch Neponset River is regulated by upstream impoundments and may be diverted for the municipal supply of Canton and Stoughton.

The Plymouth Rubber Company operates one dam in the Revere Court impoundment section of the East Branch Neponset River and diverts flow for use as non-contact cooling water. The Corps built a second dam, adjacent to the Plymouth Rubber Company dam, in the early 1960's as part of the Neponset River Basin Flood Control Project. The East Branch Neponset River flows under Plymouth Rubber Company and out the downstream end through three culverts to Factory Pond impoundment. The Canton Local Protection Project can also divert up to 2,100 cfs of water during flood conditions to a 1,600-foot channel that empties to Factory Pond, while leaving 900 cfs in the stream channel.

The average monthly flows measured at USGS gage 0110550 near the Washington Street Bridge during the summer months are presented in Table 7 below (Socolow *et al.* 1998, 1999, 2000, and 2001). From 1997 through 2000, flows in the East Branch Neponset were consistently lowest in July. The seven-day, ten-year low flow for the East Branch Neponset River at USGS gage 0110550 is 3.4 cfs (ACOE 1998).

Table 7. Average Monthly Flows (cfs) on the East Branch Neponset River as Measured at the USGS Gage 0110550 (Socolow *et al* .1998, 1999, 2000, and 2001).

Water Year	June	July	August	September	Summer Average
1997	33.7	17.6	21.8	20.9	23.5
1998	37.0	18.8	22.0	20.9	24.7
1999	36.4	18.8	21.6	22.0	24.7
2000	37.0	18.9	21.5	21.9	24.8
Average per month	36.0	18.5	21.7	21.4	24.4

Chemistry - water

NepRWA conducted bimonthly water quality monitoring on the East Branch Neponset River at Neponset Street (station EAB010) from 1998 to 2001. Water quality samples were analyzed for DO, pH, temperature, total suspended solids, ammonia, and total phosphorus (as P) (NepRWA 1999, 2001a and b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature

All temperature measurements were below the SWQS for a Class B waterbody (n=14). It should be noted that only four of the measurements were collected during the summer months of June, July, August, and September.

The ACOE *Use Attainability Study of the East Branch Neponset River Canton, Stoughton, and Sharon Massachusetts* determined that the East Branch Neponset River subwatershed has many characteristics that would cause excessively warm water temperatures to occur during summer. These include: numerous impoundments, wetlands, and open-canopy, slow moving stream reaches. As part of the study, ACOE collected hourly water temperatures at the outlet of Lake Massapoag, at the outlet of Reservoir Pond, at Upper Factory Pond at Revere Court, and at Lower Factory Pond above the Neponset Street dam. These data showed important information on the thermal behavior of the watershed; the smaller impoundment temperatures were dependent on water temperatures in Massapoag Lake and Reservoir Pond and also on air temperatures. The ACOE identified the basic problem causing high water temperatures in this subwatershed as low flow through large, open areas during warm weather. Although the ACOE presented multiple solutions, only the removal of unused dams was deemed possible for further consideration. Dams that could be considered for removal include Hammer Shop, Manns, and Trowel Shop dams, thereby reducing the subsequent impoundments (ACOE 1998).

pH

pH ranged from 7.5 to 10.4 SU (n=13) with only one measurement above 8.5 SU.

Total Suspended Solids

TSS concentrations ranged between 1 and 34 mg/L (n=17) with only one greater than 25 mg/L.

Ammonia-nitrogen (as N)

Ammonia concentrations ranged between 0.015 and 0.112 mg/L (n=18). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus (as P) concentrations ranged between 0.03 and 0.124 mg/L (n=17) with two measurements greater than 0.1 mg/L.

Chemistry- sediment

As part of the DEP 1994 survey, sediment chemical analyses were conducted on the East Branch Neponset River. Several analytes (TKN, Cd, Cr, Cu, and Pb) exceeded the S-EL threshold, while the remainder fell into the intermediate category (Kennedy et al. 1995).

The *Aquatic Life Use* for the East Branch Neponset River is assessed as non-support due to an impaired benthic community (unbalanced assemblage dominated by pollution tolerant filter-feeding taxa), increased levels of both suspended and deposited FPOM, flow alteration, and contaminated sediments.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

NepRWA conducted fecal coliform bacteria sampling in the East Branch Neponset River in conjunction with their water quality monitoring (NepRWA 1999, 2000, and 2001a and b). Samples were collected during wet and dry weather conditions. Fecal coliform bacteria counts (n=18) ranged between 8 and 17,000 cfu/100mL with six samples greater than 400 cfu/100mL and three samples greater than 2,000 cfu/100mL. Eight samples were collected during the primary contact recreation season (range 30 to 17,000 cfu/100mL) with four counts greater than 400 cfu/100mL (50%) and two counts greater than 2,000 cfu/100mL. The highest count was collected during dry weather conditions.

Based on elevated fecal coliform bacteria counts during dry weather conditions, the *Primary Contact Recreation Use* is assessed as non-support. The *Secondary Contact Recreation Use* is assessed as partial support based on the low frequency of elevated bacteria counts.

AESTHETICS

There were visual observations of instream turbidity with no evidence of trash and debris noted during the 1999 DWM biomonitoring survey. Potential non-point source pollution may originate from road runoff, lawns, and parking lots (Appendix C). However, NepRWA's water quality sampling (TSS data) indicated relatively low instream turbidity with good water clarity (NepRWA 1999, 2001a and b).

Based on overall good aesthetic quality (i.e., no evidence of trash and debris, odors), in the East Branch Neponset River, the *Aesthetics Use* is assessed as support. The East Branch Neponset River is, however, on "Alert Status" due to visual observations of high instream turbidity.

East Branch Neponset River (MA73-05) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		NON-SUPPORT	Flow alteration, Unknown, metals, organic enrichment		Hydromodification (upstream impoundments), unknown, industrial point source, contaminated sediments	
Fish Consumption		NOT ASSESSED				
Primary Contact		NON-SUPPORT	Pathogens		Urban runoff/ storm sewers	
Secondary Contact		PARTIAL SUPPORT	Pathogens		Urban runoff/ storm sewers	
Aesthetics*		SUPPORT*				

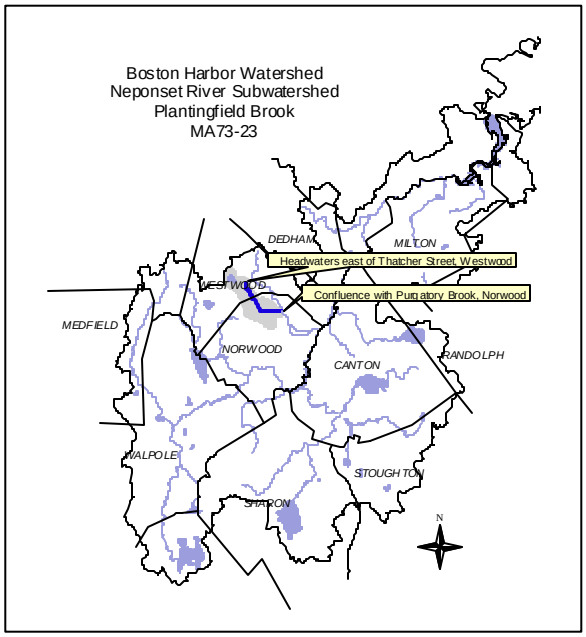
* "Alert Status" issues identified – See *Aesthetics Use* Assessment

RECOMMENDATIONS EAST BRANCH NEPONSET RIVER (MA73-05)

- Work with ACOE, DFWELE, and NepRWA to determine the feasibility of dam removal on man-made impoundments on the East Branch Neponset River.
- Work with NepRWA to determine the dry weather sources of fecal coliform bacteria contamination in the East Branch Neponset River.
- Conduct additional sediment analyses to determine if contamination is localized.

PLANTINGFIELD BROOK (SEGMENT MA73-23)

Location: Headwaters east of Thatcher Street, Westwood, to the confluence with Purgatory Brook, Norwood.
Segment Area: 2.0 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Residential	42%
Forest	31%
Open Land	10%

This segment is on the 1998 303(d) list of impaired waters for flow alteration (MA DEP 1999a).

This segment is located within the Fowl Meadow/Ponkapoag Bog ACEC (MA DEM August 2000). The use assessment for Lymans Pond is presented in the Lakes section of this assessment report (Table 11).

WMA WATER WITHDRAWAL SUMMARY AND NPDES DISCHARGE SUMMARY:

There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

During extreme rainfall events the Town of Norwood sewer system overflows raw sewage through a known SSO location along this segment of Plantingfield Brook (NepRWA 2002).

USE ASSESSMENT

Plantingfield Brook (MA73-23) Use Summary Table

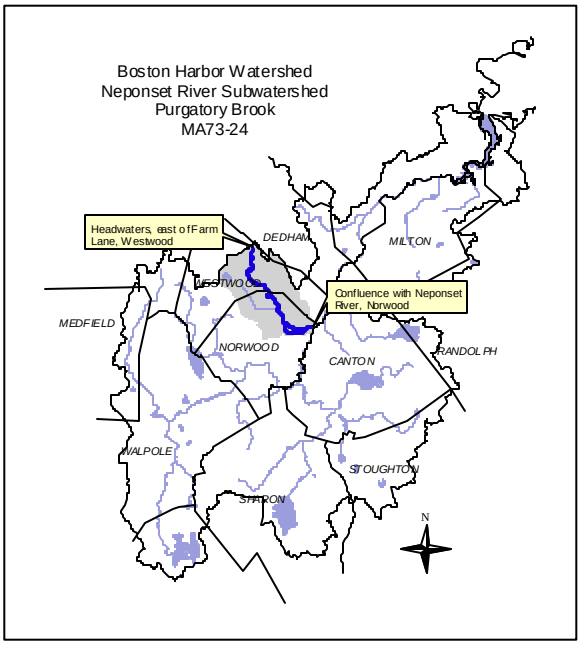
Aquatic Life	Fish Consumption	Primary Contact	Secondary Contact	Aesthetics
				
Not Assessed				

RECOMMENDATIONS PLANTINGFIELD BROOK (MA73-23)

- Work with the Town of Norwood to eliminate the discharge of raw sewage through sanitary sewer overflow (SSO) locations and to minimize the immediate impacts of these current overflows.

PURGATORY BROOK (SEGMENT MA73-24)

Location: Headwaters, east of Farm Lane, Westwood, to confluence with Neponset River, Norwood
Segment Area: 4.9 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	35%
Residential	33%
Industrial	11%

This segment is on the 1998 303(d) list of impaired waters for pathogens (MA DEP 1999a).

This segment is located within the Fowl Meadow/Ponkapoag Bog ACEC (MA DEM August 2000).

WMA *WATER WITHDRAWAL SUMMARY AND* SURFACE NPDES DISCHARGE SUMMARY:
There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE
Chemistry – water
NepRWA conducted bimonthly water quality monitoring in Purgatory Brook at Route 1A, near Everett Street (PUB022) from 1999 to 2001. Water quality samples were analyzed for DO, pH, temperature, total suspended solids, ammonia, and total phosphorus (NepRWA 1999 and 2001a and b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature
All temperature measurements were below the SWQS for a Class B waterbody (n=7).

pH
pH ranged between 6.9 and 7.7 SU (n=6).

Total Suspended Solids
TSS concentrations (n=11) ranged between BDL and 120 mg/L with only one measurement greater than 25 mg/L (wet weather).

Ammonia-Nitrogen (as N)
Ammonia concentrations ranged between BDL and 0.048 mg/L (n=11). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged between 0.034 and 0.260 mg/L with three measurements greater than 0.05 mg/L and one measurement greater than 0.1 mg/L (n=10).

Too little instream biological and chemical data (spatial and temporal coverage) were available; therefore Purgatory Brook is not assessed for the *Aquatic Life Use*. Prugatory Brook is, however, on "Alert Status" due to elevated total phosphorus concentrations.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

NepRWA conducted fecal coliform bacteria sampling in Purgatory Brook (PUB022) in conjunction with their water quality monitoring between 1999 and 2001(NepRWA 1999 and 2001a and b). Fecal coliform bacteria counts ranged between 17 and 450 cfu/100mL (n=11) with only one sample above 400 cfu/100mL. Sampling was conducted during both wet and dry weather conditions.

While one bacteria count was elevated above the *Primary Contact Recreational Use* guidance, too little data were available to assess this use; it is not assessed. However, since no bacteria counts during wet or dry weather conditions were elevated above the *Secondary Contact Recreational Use* guidance it is assessed as support.

AESTHETICS

NepRWA's water quality sampling indicated relatively low instream turbidity with good water clarity and high aesthetic quality (NepRWA 1999, 2000, 2001a and b). Just downstream from Route 1A are the remnants of a Brick and Block factory along the stream bank (NepRWA 2002).

Although there was good water clarity, too little current instream data/information were available to assess this use (i.e., not assessed).

Purgatory Brook (MA73-24) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life*		NOT ASSESSED*				
Fish Consumption		NOT ASSESSED				
Primary Contact		NOT ASSESSED				
Secondary Contact		SUPPORT				
Aesthetics		NOT ASSESSED				

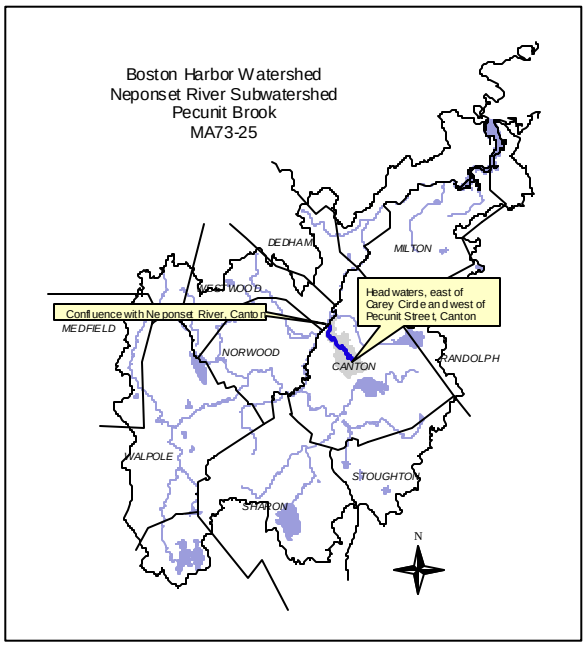
* "Alert Status" issues identified – See *Aquatic Life Use* Assessment

RECOMMENDATIONS PURGATORY BROOK (MA73-24)

- Work with the EOEA Watershed Team and NepRWA to collect additional quality assured data to assess the designated uses of Purgatory Brook.

PECUNIT BROOK (SEGMENT MA73-25)

Location: Headwaters, east of Carey Circle and west of Pecunit Street, Canton to the confluence with Neponset River, Canton.
Segment Area: 1.7 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	37%
Residential	23%
Industrial	20%

This segment of Pecunit Brook is within the Fowl Meadow and Ponkapoag Bog ACECs (MA DEM August 2000).

WMA WATER WITHDRAWAL SUMMARY AND SURFACE NPDES DISCHARGE SUMMARY:
There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Chemistry – water

NepRWA conducted bimonthly water quality monitoring in Pecunit Brook at Elm Street (PEB008) from 1999 to 2001. Water quality samples were analyzed for DO, temperature, pH, TSS, ammonia, and total phosphorus (NepRWA 1999, 2000, and 2001). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature

All temperature measurements were below the SWQS for a Class B waterbody (n=5).

pH

pH ranged between 6.9 and 7.4 SU (n=3).

Total Suspended Solids

TSS concentrations ranged between BDL and 11 mg/L (n=10).

Ammonia-Nitrogen (as N)

Ammonia concentrations ranged between 0.009 and 0.081 mg/L (n=9). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged between 0.04 and 0.129 mg/L with two out of the nine measurements greater than 0.1 mg/L.

Too little instream data were available to assess the *Aquatic Life Use* (not assessed). Pecunit Brook is, however, on "Alert Status" due to elevated total phosphorus concentrations.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

NepRWA conducted fecal coliform bacteria sampling in Pecunit Brook in conjunction with their water quality monitoring between 1999 and 2001 (NepRWA 2001 a and b). Fecal coliform bacteria counts ranged between <4 and 320 cfu/100mL (n=9). Sampling was conducted during both wet and dry weather conditions.

Fecal coliform bacteria counts were low both historically and during the 1999 through 2001 wet and dry weather sampling events. Therefore the *Primary* and *Secondary Contact Recreational* uses are assessed as support.

AESTHETICS

NepRWA's water quality sampling indicated low instream turbidity with good water clarity and high aesthetic value (NepRWA 2001a and b).

Based on the high aesthetic quality of Pecunit Brook the *Aesthetics Use* is assessed as support.

Pecunit Brook (MA73-25) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life*		NOT ASSESSED*				
Fish Consumption		NOT ASSESSED				
Primary Contact		SUPPORT				
Secondary Contact		SUPPORT				
Aesthetics		SUPPORT				

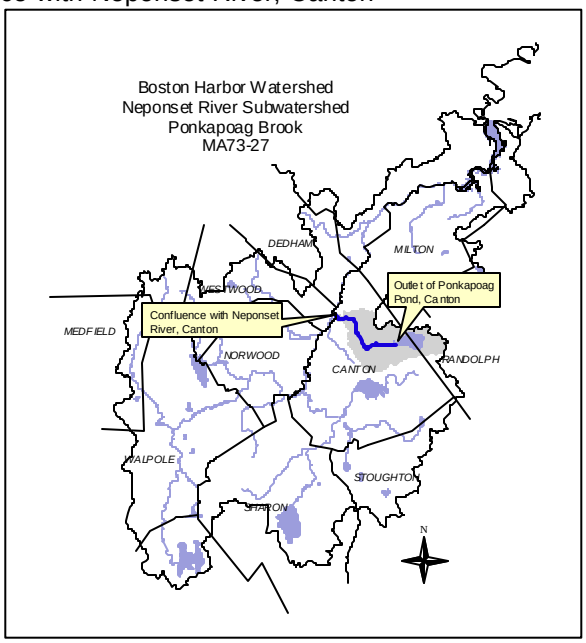
* "Alert Status" issues identified—See *Aquatic Life Use* Assessment

RECOMMENDATIONS PECUNIT BROOK (MA73-25)

- Work with local area golf courses to reduce water use and nutrient inputs to the Pecunit Brook Subwatershed.

PONKAPOAG BROOK (SEGMENT MA73-27)

Location: Outlet of Ponkapoag Pond, Canton to confluence with Neponset River, Canton
Segment Area: 3.2 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	34%
Residential	25%
Open Land	17%

This segment is on the 1998 303(d) list of impaired waters for pathogens (MA DEP 1999a). In 2001, DFWELE stocked trout in Ponkapoag Brook for the purpose of recreational fishing (DFWELE 15 March 2001). This segment is located within the Fowl Meadow/Ponkapoag Bog ACEC (MA DEM August 2000). The central resource features of the Fowl Meadow and Ponkapoag Bog ACEC are the Neponset River and the Ponkapoag Pond and Bog. Ponkapoag Bog and Pond and the natural communities and wildlife habitats form the core resources of the Ponkapoag Bog area. The use assessment for Ponkapoag Pond is provided in the Lakes section of this assessment report (Table 11).

WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source	Authorized Withdrawal (MGD)	1999 Average Withdrawal (MGD)
Blue Hill Country Club			31905001	Irrigation Well	0.37	0.19
Lost Brook Golf Club			31922001	Irrigation Pond	0.22	0.01

SURFACE NPDES DISCHARGE SUMMARY:

There are no wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Chemistry – water

NepRWA conducted bimonthly water quality monitoring in Ponkapoag Brook at Washington Street (POB024) from 1999 to 2001. Water quality samples were analyzed for DO, temperature, pH, TSS, ammonia, and total phosphorus (NepRWA 2001a and b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature

All temperature readings were below the SWQS for a Class B waterbody (n=5).

pH

pH ranged between 6.2 and 6.7 SU with three samples less than 6.5 SU (n=5).

Total Suspended Solids

TSS concentrations ranged between BDL and 41 mg/L (n=10) with two samples greater than 25 mg/L (collected during wet weather conditions).

Ammonia-Nitrogen (as N)

Ammonia concentrations ranged from 0.012 to 0.160 mg/L. All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged from 0.032 to 0.142 mg/L (n=9) with two measurements greater than 0.1 mg/L, both collected during wet weather.

Although pH was slightly low and total phosphorus concentrations were somewhat elevated, too little instream data (i.e., biological and dissolved oxygen) were available to assess the *Aquatic Life Use* (not assessed). The segment, however, is on "Alert Status" due to the possible negative impacts of elevated nutrients and low pH.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

NepRWA conducted fecal coliform bacteria sampling in Ponkapoag Brook in conjunction with their water quality monitoring between 1999 and 2001 (NepRWA 2001a and b). Fecal coliform bacteria counts ranged between 3 and 332 cfu/100mL (n=10). Sampling was conducted during both wet and dry weather conditions.

Fecal coliform bacteria counts were low both historically and during the 1999 through 2001 wet and dry weather sampling events, therefore, the *Primary* and *Secondary Contact Recreational* uses are assessed as support.

AESTHETICS

NepRWA's water quality sampling indicated low instream turbidity with good water clarity and high aesthetic value (NepRWA 2001a and b).

Based on the high aesthetic quality of Ponkapoag Brook the *Aesthetics Use* is assessed as support.

Ponkapoag Brook (MA73-27) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life*		NOT ASSESSED*				
Fish Consumption		NOT ASSESSED				
Primary Contact		SUPPORT				
Secondary Contact		SUPPORT				
Aesthetics		SUPPORT				

* "Alert Status" issues identified – see *Aquatic Life Use* Assessment

RECOMMENDATIONS PONKAPOAG BROOK (MA73-27)

- Investigate and eliminate possible sources of elevated phosphorus to Ponkapoag Brook.

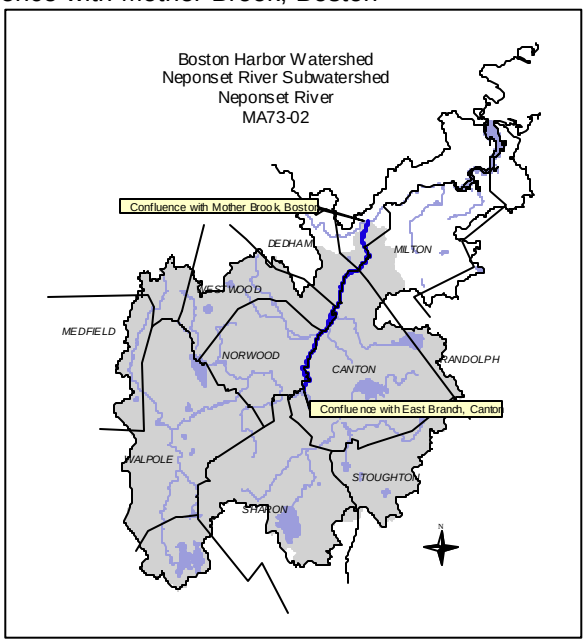
- Collect additional quality assured water quality data to assess the *Aquatic Life Use* and determine if low pH is a problem.

- Work with NepRWA to conduct a citizen outreach education workshop to educate local residents and landowners about good stream stewardship (i.e. yard waste disposal practices, reduction of impervious services, and road runoff). Additionally work with local area golf courses to reduce water use and to develop green care practices that will reduce nutrient inputs to the Ponkapoag Brook Subwatershed.

- Total suspended solids concentrations were elevated during wet weather conditions. Investigate sources of solids in the brook including road runoff and erosion.

NEPONSET RIVER (SEGMENT MA73-02)

Location: Confluence with East Branch, Canton to confluence with Mother Brook, Boston
Segment Area: 7.9 miles.
Classification: Class B Warm Water Fishery.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	37%
Residential	35%
Open Land	8%

This segment is on the 1998 303(d) list of impaired waters for priority organics, metals, organic enrichment/ low DO, pathogens, oil and grease, and turbidity (MA DEP 1999a). This segment is located within the Fowl Meadow/Ponkapoag Bog ACEC (MA DEM August 2000). The use assessment for Sprague Pond is provided in the Lakes section of this assessment report (Table 11).

WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)*	1999 Average Withdrawal (MGD)
Dedham/ Westwood Water Department	3073000	9P31907301	31907301	06G 07G 08G 09G 13G	2.62 registered 0.49 permitted	2.96

* System-wide withdrawal

The Dedham-Westwood Water District WMA permit includes conditions from the Dedham-Westwood Water District's Interbasin Transfer Approval. The limits include:

1) no withdrawal from 13G (Fowl Meadow Well) when streamflow in the Neponset River is less than 0.15 cfsm;
2) no withdrawals from the Fowl Meadow Well during the months of March, April, or May when the flow in the Neponset River is less than one foot in depth or 95 cfs below the Milton Lower Falls Dam;
3) the Water District shall install a staff gage at the Milton Lower Falls Dam to provide information on water depth; and the Water District will submit annual reports detailing gage readings and volumes pumped from the Fowl Meadow Well (LeVangie, 2001).

NPDES DISCHARGE SUMMARY:

There are no regulated wastewater discharges to this segment, however, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Chemistry - water

NepRWA collected bimonthly water quality samples from 1997 to 2001 at three stations (upstream to downstream) along this segment of the Neponset River:

NER 125- Neponset River at Dedham Street Bridge, Canton (1999-2001)
NER 130- Neponset River at Green Lodge Street, Canton (1997, 1998)
NER 150- Neponset River at Paul's Bridge, Milton (1997-2001)

Parameters measured included DO, temperature, pH, TSS, ammonia, and total phosphorus (NepRWA 1998, 1999, 2001a and 2001b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature

All temperatures were below the SWQS for a Class B waterbody (n=42).

pH

pH ranged from 6.3 to 8.5 SU with only three less than 6.5 SU (n=40).

Total Suspended Solids

TSS concentrations ranged between BDL to 12 mg/L (n=45).

Ammonia-Nitrogen (as N)

Ammonia concentrations ranged between 0.007 and 0.135 mg/L (n=45). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged between 0.036 and 0.100mg/L (n=42) with 27 greater than 0.05mg/L.

Chemistry- sediment

As part of the DEP 1994 survey, sediment chemical analyses were conducted at three stations (Fowl Meadow, Green Lodge St, and downstream Fowl Meadow) on this segment of the Neponset River (Kennedy et al. 1995). Several analytes in the sediments from multiple sampling locations (e.g., TP, TKN, Hg, and Cu) exceeded the S-EL threshold.

Too little current data/information were available to assess the *Aquatic Life Use* (i.e., not assessed) for this segment of the Neponset River. However, this segment of the Neponset River is on "Alert Status" due to the possible negative impacts caused by elevated levels of total phosphorus and the historically high contaminant levels in the sediments.

FISH CONSUMPTION

MDPH issued a fish consumption advisory for the Neponset River from the Hollingsworth and Vose Dam to the Tilestone Dam due to elevated levels of PCBs in fish tissue (MDPH 2001a). The MDPH advisory recommends the following:

1. Children younger than 12-years, pregnant women, and nursing mothers, should not consume any brown bullhead from the Neponset River.
2. The general public should limit consumption of brown bullhead from the Neponset River to two meals per month.

Based on the MDPH site-specific fish consumption advisory, this segment is assessed as non-support for the *Fish Consumption Use.*

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

NepRWA collected fecal coliform bacteria samples on this segment of the Neponset River between 1997-2001 as part of their water quality monitoring program (NepRWA 1998, 1999, 2001a, and 2001b). Samples were collected during both wet and dry weather conditions. Fecal coliform bacteria counts ranged between 8 and 32,000 cfu/100mL (n=48). Fecal coliform bacteria counts collected during the primary contact season ranged between 12 and 32,000 cfu/100mL (n=28) with three dry weather counts above 400 cfu/100mL (11%) and two wet weather counts greater than 2,000 cfu/100mL. There were three counts greater than 4,000 cfu/100mL with only one collected during wet weather conditions.

Due to intermittent elevated levels of pathogens during wet and dry weather conditions the *Primary* and *Secondary Contact Recreational* uses are assessed as partial support.

AESTHETICS

NepRWA's water quality sampling indicated relatively low instream turbidity (NepRWA 1999, 2000, 2001). This segment of the Neponset River is subject to large rafts of storm water debris after rainfall events. Additionally, trash and debris enter the river at the road crossings and from abutting properties.

Due to trash and debris following storm events the *Aesthetics Use* is assessed as partial support.

Neponset River (MA73-02) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life*		NOT ASSESSED*				
Fish Consumption		NON-SUPPORT	PCBs		Unknown	
Primary Contact		PARTIAL SUPPORT	Pathogens		Urban runoff/ storm sewers	
Secondary Contact		PARTIAL SUPPORT	Pathogens		Urban runoff/ storm sewers	
Aesthetics		PARTIAL SUPPORT	Trash and debris		Urban runoff/ storm sewers	

* "Alert Status" Issues identified – see *Aquatic Life Use* Assessment

RECOMMENDATIONS NEPONSET RIVER (MA73-02)

- Investigate possible sources of total phosphorus to the Neponset River including point and nonpoint sources of pollution.

- The DWM 1994 benthic macroinvertebrate surveys identified a moderately impacted benthic community. Conduct a biological survey on the Neponset River to determine if water quality has improved and the benthic community recovered.

- Conduct additional sediment analyses (metals and toxicity) to determine if the historical contamination is currently impacting water quality and the biota.

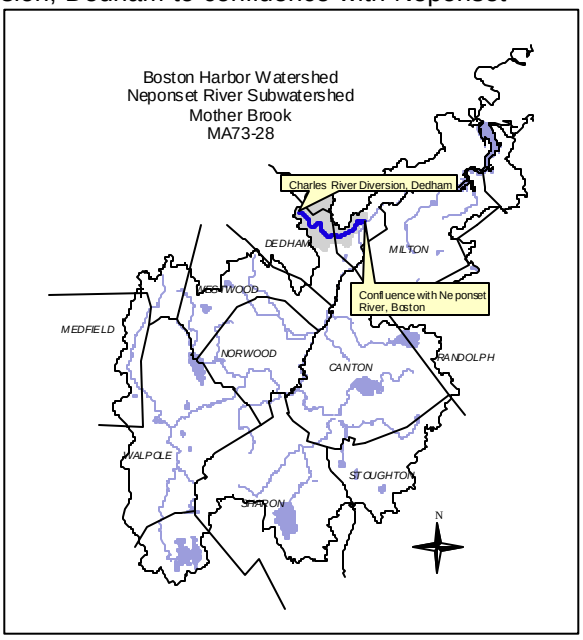
- Continue to monitor pathogen levels in the Neponset River.

- Work with NepRWA to conduct a citizen outreach education workshop to educate local residents and landowners about good stream stewardship (i.e., yard waste disposal practices, reduction of impervious services, and road runoff). Additionally, conduct a stream cleanup along this segment of the Neponset River.

- Work with local highway departments to implement BMPs to reduce sediment inputs and trash and debris from road crossings.

MOTHER BROOK (SEGMENT MA73-28)

Location: From its headwaters at the Charles River Diversion, Dedham to confluence with Neponset River, Boston
Segment Area: 3.1 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Residential	59%
Open Land	14%
Commercial	12%

This segment (as MA72-13) is on the 1998 303(d) list of impaired waters for nutrient, organic enrichment/ low DO, and pathogens (MA DEP 1999a). As of May 2000, this segment's WBID has changed to MA73-28 in the Neponset River Subwatershed.

There are three dams within this segment: Mother Brook Dam at Charles River, Mother Brook Dam at Maverick St., and Colburn Street Dam. They are all maintained by the MDC. Additional information on dams in Massachusetts may be obtained from MA DEM at http://www.state.ma.us/dem/ and a MassGIS datalayer showing the location of dams in Massachusetts will soon be available at: http://www.state.ma.us/dem/programs/gis/de%5Fdl.htm. The Charles River Diversion is capable of diverting up to one-third of the flow of the Charles River through Mother Brook and into the Neponset River. The MDC regulates the flow twice per year in the spring and fall. The channel of Mother Brook has been altered to contain the large flows associated with this diversion.

WMA WATER WITHDRAWAL AND SURFACE NPDES DISCHARGE SUMMARY:

There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Habitat/Flow

The channel of Mother Brook has been modified to handle the increased flows from the diversion of Charles River water during spring and fall. During dry periods when no water is being diverted the brook flows through a wide flat channel (NepRWA 2002).

Chemistry – water

NepRWA conducted bimonthly water quality monitoring in Mother Brook at the Route 1 Dam, Bussey Street, and River Street (MOB001 from 1997 to 2001; MOB010 and MOB020 in 1997). Water quality samples were analyzed for DO, temperature, pH, TSS, ammonia, and total phosphorus (NepRWA 1999, 2000, and 2001). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

DO

In 1994, DWM surveyed Mother Brook as part of the Neponset River Watershed Project. Dissolved oxygen concentrations (n=8) measured during the survey ranged between 3.8 and 8.5 mg/L with two measurements less than 5.0 mg/L. Additionally, three of the eight percent saturations (range: 41.0-72.9) were less than 60% (Kennedy et al. 1995). Samples were not collected pre-dawn, and therefore, these data do not represent worst-case conditions.

Temperature

All temperature readings were below the SWQS for a Class B waterbody (n=16).

pH

pH ranged between 6.6 and 8.0 SU (n=16).

Total Suspended Solids

TSS concentrations ranged between BDL and 17 mg/L (n=18).

Ammonia-Nitrogen (as N)

Ammonia concentrations ranged from 0.013 to 0.253 mg/L (n=11). During 2000 and 2001, ammonia-nitrogen concentrations were slightly elevated, however, temperature and pH data were not available to determine the CCC. Based on the conservative watershed CCC of 0.237 mg/L, two of the eleven measurements exceeded the chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged from 0.055 to 0.157 mg/L (n=10) with three samples greater than 0.1 mg/L.

Based on elevated total phosphorus concentrations, flow alteration, and historically low dissolved oxygen concentrations, the *Aquatic Life Use* for Mother Brook is assessed as partial support.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

NepRWA conducted fecal coliform bacteria sampling in Mother Brook as part of their water quality monitoring between 1997 and 2001 (NepRWA 1998, 1999, 2001a and b). Samples were collected during both wet and dry weather. Fecal coliform bacteria counts ranged between 25 and 2,880 cfu/100mL (n=24) with seven counts greater than 400cfu/100mL and two greater than 2,000cfu/100mL. During the primary contact season, fecal coliform bacteria counts (n=15) ranged between 60 and 2,880 cfu/100mL with six counts greater than 400cfu/100mL (40%).

Based on elevated fecal coliform bacteria counts during dry weather conditions (three in 1997 and one in 2000), the *Primary Contact Recreation Use* is assessed as partial support. The *Secondary Contact Recreation Use* is assessed as support since no counts were elevated above the dry or wet weather guidance.

AESTHETICS

NepRWA's water quality sampling indicated relatively low instream turbidity (NepRWA 1998, 1999, 2001a and b). Objectionable odors and trash and debris have been identified in Mother Brook (NepRWA 2002).

It is best professional judgment that the *Aesthetics Use* for Mother Brook be assessed as support based on water quality data. Mother Brook is, however, on "Alert Status" due to localized areas of trash and debris.

Mother Brook (MA73-28) Use Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		PARTIAL SUPPORT	Low DO, nutrients, flow alteration		Unknown, hydromodification	Urban runoff/storm sewers
Fish Consumption		NOT ASSESSED				
Primary Contact		PARTIAL SUPPORT	Pathogens		Urban runoff/storm sewers	
Secondary Contact		SUPPORT				
Aesthetics*		SUPPORT*				

* “Alert Status” Issues identified—See *Aesthetics Use* Assessment

RECOMMENDATIONS MOTHER BROOK (MA73-28)

- Identify and reduce possible sources of total phosphorus to Mother Brook including point and nonpoint sources of pollution.

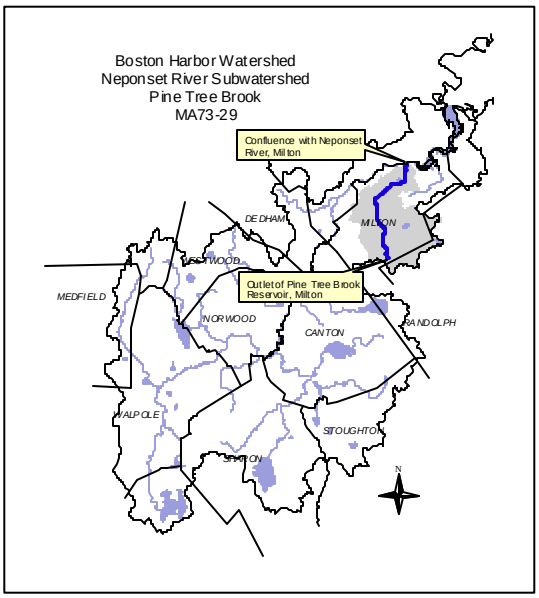
- The MDC regulates the flow to Mother Brook twice per year during spring and fall (Kennedy *et al.* 1995). Work with MDC to manage the release of water during low flows through the Charles River Diversion to increase the habitat quality in Mother Brook.

- Work with the MDC, ACOE, DFWELE, and NepRWA to determine the feasibility of dam removal on man-made impoundments on Mother Brook as a means to increase habitat quality and restore natural stream velocity-depth combinations. If it is determined that removal is unfeasible, consider establishing a plan to address the lack of fish passage at the three dams on this segment.

- In conjunction with the Town of Dedham and the City of Boston, identify and eliminate sources of fecal coliform bacteria contamination to Mother Brook including sewer cross connections.

PINE TREE BROOK (SEGMENT MA73-29)

Location: Outlet of Hillside Pond, Milton through Pope's Pond to confluence Neponset River, Milton.
Segment Area: 4.7 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Forest	47%
Residential	41%
Open Land	8%

This segment is on the 1998 303(d) list of impaired waters for organic enrichment/ low DO, other habitat alterations, and pathogens (MA DEP 1999a). The use assessment for Popes and Turners ponds are provided in the Lakes section of this assessment report (Table 11). In 2001, DFWELE stocked trout in Pine Tree Brook for the purpose of recreational fishing (DFWELE 15 March 2001). There are three dams located along this segment: Pine Tree Brook Reservoir Dam, Pine Tree Brook Dam, and Harland Street Detention. All three dams are maintained by the Town of Milton (Ryan 2001). Additional information on dams in Massachusetts may be obtained from MA DEM at http://www.state.ma.us/dem/ and a MassGIS datalayer showing the location of dams in Massachusetts will soon be available at: http://www.state.ma.us/dem/programs/gis/de%5Fdl.htm.

Since 1997, Central Artery Tunnel project dirt has been trucked to the former West Quincy landfills and the town of Milton's 56-acre landfill. The solid waste is being covered with 20 to 30 feet of historic fill, which is graded, shaped, and then topped with an 18-inch Boston Blue Clay cap (Big Dig 2000).

WMA WATER WITHDRAWAL SUMMARY AND SURFACE NPDES DISCHARGE SUMMARY:
There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

During extreme rainfall events the Town of Milton sewer system overflows raw sewage through SSO locations along this segment of Pine Tree Brook (NepRWA 2002).

USE ASSESSMENT

AQUATIC LIFE
Chemistry – water
NepRWA conducted bimonthly water quality monitoring on Pine Tree Brook between 1997 and 2001:

PTB012- Pine Tree Brook at Unquity Road (1997)
PTB022- Pine Tree Brook at Canton Avenue (1997-2001)
PTB028- Pine Tree Brook at Blue Hills Parkway (1998-2001)
PTB035- Pine Tree Brook at Brook Road (1997-2001)
PTB047- Pine Tree Brook at Central Avenue (1997-2001)

Samples were analyzed for DO, temperature, pH, TSS, ammonia, and total phosphorus (NepRWA 1998, 1999, 2001a, and 2001b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature

All temperature measurements were below the SWQS for a Class B waterbody (n=67).

pH

pH ranged between 6.0 and 8.6 SU (n=59) with four less than 6.5 SU and two greater than 8.5 SU.

Total Suspended Solids

TSS concentrations ranged between BDL and 140 mg/L (n=72) with only four greater than 25 mg/L (three occurred on 22 March 2000 during wet weather conditions).

Ammonia-Nitrogen (as N)

Ammonia concentrations ranged from 0.003 to 0.09 mg/L (n=70). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged from 0.004 to 0.274 mg/L (n=67) with 38 greater than 0.05 mg/L and 12 greater than 0.1 mg/L (18%).

Although total phosphorus concentrations were elevated, the data were too limited (i.e., no biological, dissolved oxygen) and therefore the *Aquatic Life Use* for Pine Tree Brook is not assessed. This brook however, is on "Alert Status" due to the possible negative impacts of elevated nutrient concentrations.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

NepRWA conducted fecal coliform bacteria monitoring of Pine Tree Brook as part of their water quality monitoring program between 1997 and 2001 (NepRWA 1998, 1999, 2001a, and 2001b). Samples were collected during both wet and dry weather conditions. Fecal coliform bacteria counts ranged between <4 and 3,900 cfu/100mL (n=80) with six counts greater than 2000 cfu/100mL (50% during dry weather). During the primary contact season (n=51) 22 counts were greater than 400 cfu/100mL (50% during dry weather).

Based on the elevated pathogen counts collected during dry weather conditions, the *Primary* and *Secondary Contact Recreational* uses are assessed as non-support.

Pine Tree Brook (MA73-29) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life*		NOT ASSESSED*				
Fish Consumption		NOT ASSESSED				
Primary Contact		NON-SUPPORT	Pathogens		Unknown	Illicit sewer connections, municipal point source (SSO)
Secondary Contact		NON-SUPPORT	Pathogens		Unknown	Illicit sew er connections, municipal point source (SSO)
Aesthetics		NOT ASSESSED				

* "Alert Status" issues identified – See *Aquatic Life Use* assessment

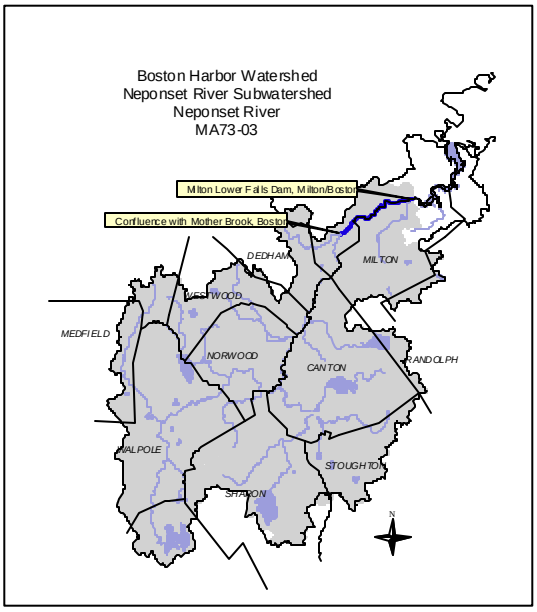
RECOMMENDATIONS PINE TREE BROOK (MA73-29)

- In conjunction with ACOE, DFWELE, and NepRWA determine the feasibility/importance of dam removal on man-made impoundments on Pine Tree Brook.

- Work with the Town of Milton to eliminate the discharge of raw sewage through sanitary sewer overflow (SSO) locations and to minimize the immediate impacts of these current overflows.

NEPONSET RIVER (SEGMENT MA73-03)

Location: Confluence with Mother Brook, Boston to Milton Lower Falls Dam, Milton/Boston
Segment Area: 3.7 miles.
Classification: Class B, Warm Water Fishery, CSO*.
(*In the updated 2002 SWQS, the CSO designation will be removed from the Neponset River. See classification section.)



Land-use estimates for the subwatershed (map inset, gray shaded area):

Residential	37%
Forest	36%
Open Land	9%

This segment is on the 1998 303(d) list of impaired waters for priority organics, metals, organic enrichment/ low DO, pathogens, and oil and grease (MA DEP 1999a). This segment is located within the Neponset River Estuary ACEC (MA DEM August 2000). There are two dams located along this segment of the Neponset River: the Neponset River Dam- Hyde Park and the Lower Mills Dam. A feasibility study for dam removal of the Milton Lower Falls Dam and the second obstruction, Tilestone is underway. In anticipation of improved access to this system DMF has been stocking both American shad and blueback herring into the Neponset system. Since 1996, over 16,000 blueback herring and almost 1000 American shad have been transported from other source systems and released into the upper Neponset River in Canton. The Neponset herring are managed under state regulations (Brady 2001).

WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)	1999 Average Withdrawal (MGD)
Bay State Paper Company			31903501	Neponset River	2.06	0.46

SURFACE NPDES DISCHARGE SUMMARY:

There are no wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

Chemistry - water

NepRWA collected bimonthly water quality samples at six stations on this segment of the Neponset River between 1997 and 2001:

NER165- Neponset River at Fairmount railroad station (1997-2001)
NER175- Neponset River at Truman parkway (1997)
NER178- Neponset River at Monposet Street (1998)
NER185- Neponset River at Ryan Playground (1997-2001)
NER200- Neponset River at Adams Street Bridge (1997-2001)

NER215- Neponset River at Granite Ave (1998)

Samples were analyzed for DO, temperature, pH, TSS, ammonia, and total phosphorus (as P) (NepRWA 1998, 1999, 2001a, and 2001b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

MWRA collected water quality samples at one station, 055 (above the dam in Milton at Baker Circle) at the downstream end of this segment of the Neponset River between 1996 and 2000 as part of their ongoing receiving water monitoring program. Parameters measured included DO, percent saturation, temperature, turbidity, and chlorophyll *a* (Coughlin 2002).

DO

MWRA dissolved oxygen concentrations ranged from 2.03 to 17.68 mg/L with only 15 of the 397 samples less than 5.0 mg/L. Percent saturation ranged between 23.8 and 196.4% with 16 less than 60% and three greater than 115% (n=397). No samples were collected pre-dawn and, therefore, do not represent a worst-case scenario. It should be noted that the 15 low dissolved oxygen concentrations were recorded during the summer months of June, July and August, in both the surface and bottom waters.

Temperature

All temperature measurements (both NepRWA's and MWRA's) were below the SWQS for a Class B waterbody (n=481).

pH

NepRWA pH measurements ranged from 5.9 to 8.6 SU (n=64) with four less than 6.3 SU and one greater than 8.5 SU.

Turbidity

MWRA turbidity readings ranged between 0 and 37 NTU with an average of 5.81 NTU (n=265).

Total Suspended Solids

NepRWA TSS concentrations ranged between 1 and 64 mg/L (n=91) with five concentrations greater than 25 mg/L (two during dry weather and three, all on the same day, during wet weather).

Ammonia-Nitrogen (as N)

NepRWA ammonia concentrations ranged between 0.011 and 0.333 mg/L (n=84). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged between 0.003 and 0.262 mg/L (n=81) with 65 concentrations greater than 0.05 mg/L and 13 greater than 0.1 mg/L (16%).

Chlorophyll a

MWRA chlorophyll *a* concentrations ranged from 0.5 to 312 µg/L (n=178).

Chemistry- sediment

As part of the DEP 1994 survey, sediment chemical analyses were conducted at one station (upstream, Baker Dam) on this segment of the Neponset River (Kennedy *et al.* 1995). Several analytes (e.g., Pb, Hg, and Cu) exceeded the S-EL threshold, while TP, TKN, As, Cd, Cr, Ni and Zn exceeded the L-EL. Oil deposits were also noted during this sediment sampling.

Although total phosphorus concentrations were somewhat elevated and dissolved oxygen concentrations were occasionally low during the summer months, the *Aquatic Life Use* for this segment of the Neponset River is currently not assessed. Historical sediment data indicates that the *Aquatic Life Use* was impaired. Recent sediment data and biological data for this segment are needed to determine if contaminated sediments continue to negatively impact the aquatic life. Due to the probability of negative

impacts associated with historically high contaminant levels in sediments and the possible negative impacts caused by elevated levels of total phosphorus and low dissolved oxygen concentrations, this segment of the Neponset River is on “Alert Status”.

FISH CONSUMPTION

MDPH issued a fish consumption advisory for the Neponset River from the Hollingsworth and Vose Dam to the Tilestone Dam due to elevated levels of PCBs in fish tissue (MDPH 2001a). The MDPH advisory recommends the following:

3. Children younger than 12-years, pregnant women, and nursing mothers, should not consume any brown bullhead from the Neponset River.
4. The general public should limit consumption of brown bullhead from the Neponset River to two meals per month.

Based on the MDPH site-specific fish consumption advisory, 0.9 miles of this segment of the Neponset River are assessed as non-support for the *Fish Consumption Use.*

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

NepRWA also conducted fecal coliform bacteria monitoring on this segment of the Neponset River as part of their water quality monitoring program between 1997 and 2001 (NepRWA 1998, 1999, 2001a, and 2001b). Samples were collected during both wet and dry weather conditions. Fecal coliform bacteria counts (n=91) ranged between 25 and 250,000 cfu/100mL (dry weather). Overall, fecal coliform bacteria counts were greater than 2,000 cfu/100mL on ten occasions (five dry and five wet). During the primary contact season (n=56) 29 counts were greater than 400 cfu/100mL (approximately 50% during dry weather).

MWRA collected fecal coliform bacteria samples as part of their ongoing receiving water monitoring program at one station (055) at the downstream end of this segment of the Neponset River (Coughlin 2002). Samples were collected during both wet and dry weather conditions. Fecal coliform bacteria counts ranged from 70 to 20,800 cfu/100mL (n=251) with 13 counts greater than 4,000 cfu/100mL. The highest count was during dry weather conditions. During the primary contact recreation season, fecal coliform bacteria counts ranged between 120 and 20,800 cfu/100mL with 121 of the 159 samples greater than 400 cfu/100mL (76%).

Based on the elevated pathogen counts collected during dry weather conditions, the *Primary* and *Secondary Contact Recreational* uses are assessed as non-support.

AESTHETICS

NepRWA’s water quality sampling indicated relatively low instream turbidity (NepRWA 1998, 1999, 2000, 2001). Large quantities of trash and debris have been identified throughout this segment of the Neponset River (NepRWA 2002). Secchi disk depth readings recorded by MWRA at station 055, at the lower impounded section of this segment, ranged from 6 to 9 m (n=88).

Based on the prevalence of trash and debris, the *Aesthetics Use* for this segment the Neponset River is assessed as non-support.

Neponset River (MA73-03) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life*		NOT ASSESSED *				
Fish Consumption		NON-SUPPORT 0.9 miles NOT ASSESSED 2.8 miles	PCBs		Unknown	
Primary Contact		NON-SUPPORT	Pathogens		Unknown	Urban Runoff/ storm sewers
Secondary Contact		NON-SUPPORT	Pathogens		Unknown	Urban Runoff/ storm sewers
Aesthetics		NON-SUPPORT	Trash and debris		Urban Runoff/ storm sewers	

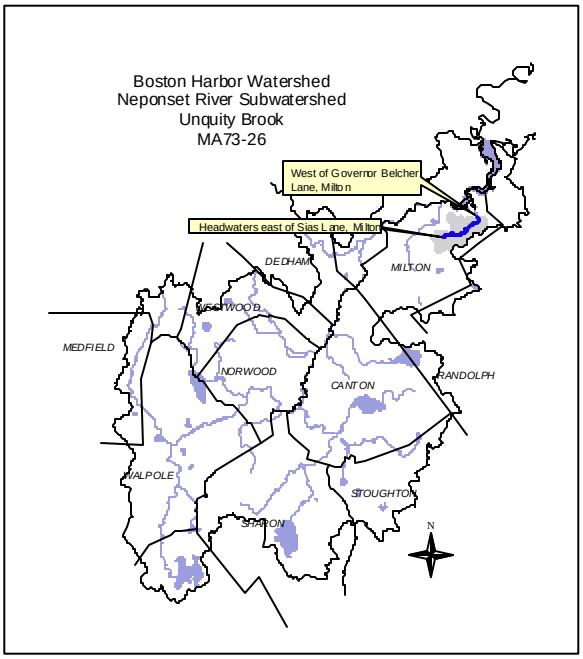
* "Alert Status" issues identified – see *Aquatic Life Use* Assessment

RECOMMENDATIONS NEPONSET RIVER (MA73-03)

- Investigate possible sources of total phosphorus to the Neponset River including point and nonpoint sources of pollution.
- The DWM 1994 benthic macroinvertebrate surveys identified a moderately impacted benthic community. Conduct a biological survey on the Neponset River to determine if water quality has improved and the biota has recovered.
- Conduct additional sediment analyses (metals and toxicity) to determine if the historical contamination is currently impacting water quality and the biota.
- Investigate possible additional sources and continue to monitor pathogen levels in the Neponset River to determine if the ongoing sewer repair projects are effective.
- Work with NepRWA to conduct a citizen outreach education workshop to educate local residents and landowners about good stream stewardship (i.e., yard waste disposal practices, reduction of impervious services, and road runoff).
- Conduct a stream cleanup along this segment of the Neponset River.
- Work with the highway departments to implement BMPs to reduce sediment inputs and trash and debris from road crossings.

UNQUITY BROOK (SEGMENT MA73-26)

Location: Isolated (urban): Headwaters east of Sias Lane, west of Randolph Avenue to east of Otis Street, west of Governor Belcher Lane, Milton.
Segment Area: 1.4 miles.
Classification: Class B.



Land-use estimates for the subwatershed (map inset, gray shaded area):

Residential	62%
Open Land	15%
Forest	14%

This segment is on the 1998 303(d) list of impaired waters for organic enrichment/ low DO and pathogens (MA DEP 1999a). This segment of Unquity Brook is located within the Fowl Meadow/ Ponkapoag Bog ACEC. In addition, the downstream/tidal portion of Unquity Brook from Adams St. to the confluence with the Neponset River is located within the Neponset River Estuary ACEC (MA DEM August 2000).

WMA WATER WITHDRAWAL AND SURFACE NPDES DISCHARGE SUMMARY:

There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II general NPDES storm water permits for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water permit will be issued by December 2002. Permit applications from the towns must be submitted to EPA by March 2003 and coverage begins with the permit application (Scarlet 2001).

During extreme rainfall events the Town of Milton sewer system overflows raw sewage through SSO locations along this segment of Unquity Brook (NepRWA 2002).

USE ASSESSMENT

AQUATIC LIFE

Habitat/Flow

Unquity Brook is an urban interrupted stream that flows from its headwaters under a cemetery, then above ground, to a reach that is entirely dewatered (i.e., streambed is completely drained/dry). The Brook is then culverted and routed underground. When the Brook reappears above ground the streamflow is restricted to a three-foot stone and concrete channel, with no riparian buffer zone. The Brook is again culverted under a street before it then comes above ground to its end.

Chemistry – water

NepRWA conducted bimonthly water quality monitoring in Unquity Brook at three stations, at Randolph Avenue, at Adams Street, and at Squantum Street/Christopher Road, from 1997 to 2001. Samples were analyzed for DO, temperature, pH, TSS, ammonia, and total phosphorus (as P) (NepRWA 1998, 1999, 2001a and b). Based on the field collection techniques (i.e., bucket sampling) the accuracy of these dissolved oxygen data is suspect and therefore are not presented in this assessment report.

Temperature

All temperature measurements were below the SWQS for a Class B waterbody (n=63).

pH

pH ranged between 5.9 and 8.7 SU (n= 59) with eight samples less than 6.5 SU and five greater than 8.5 SU.

Total Suspended Solids

TSS concentrations ranged between BDL and 377 mg/L (n=84) with ten samples above 25 mg/L (nine during wet weather conditions).

Ammonia-Nitrogen (as N)

Ammonia concentrations ranged between 0.002 and 1.61 mg/L (n=76). All measurements were below the acute and chronic water quality criteria for ammonia-nitrogen.

Total Phosphorus (as P)

Total phosphorus concentrations ranged between 0.003 and 0.92 mg/L (n=70) with 21 samples greater than 0.1 mg/L.

The *Aquatic Life Use* for Unquity Brook is assessed as partial support based on loss of habitat due to channelization, pH measurement outside the SWQS for a Class B waterbody, and elevated nutrients.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

NepRWA also conducted fecal coliform bacteria sampling in Unquity Brook in conjunction with water quality monitoring (NepRWA 1998, 1999, 2001a and b). Samples were collected during both wet and dry weather conditions. Fecal coliform bacteria counts (n=86) ranged between 0 and 158,000 cfu/100mL (wet weather). During the primary contact season (n=38) 24 counts were greater than 400 cfu/100mL (9 during dry weather). Throughout the year, counts were greater than 4,000 cfu/100mLs on nine occasions with four during dry weather conditions.

Based on the elevated pathogen counts collected during dry weather conditions, the *Primary* and *Secondary Contact Recreational* uses are assessed as non-support.

AESTHETICS

NepRWA's water quality sampling indicated instream turbidity during wet weather conditions (NepRWA 1998, 1999, 2001a and b). Large quantities of trash and debris and sedimentation have been identified throughout Unquity Brook (NepRWA 2002).

Based on the prevalence of trash and debris the *Aesthetics Use* for Unquity Brook is assessed as non-support.

Unquity Brook (MA73-26) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		PARTIAL SUPPORT	Nutrients, flow alteration, habitat alteration, low pH		Hydromodification, unknown	Urban runoff/storm sewers
Fish Consumption		NOT ASSESSED				
Primary Contact		NON-SUPPORT	Pathogens		Municipal point source (SSO), urban runoff/storm sewers	
Secondary Contact		NON-SUPPORT	Pathogens		Municipal point source (SSO), urban runoff/storm sewers	
Aesthetics		NON-SUPPORT	Trash and debris, siltation		Urban runoff/storm sewers	

RECOMMENDATIONS UNQUITY BROOK (MA73-26)

- Investigate possible sources of total phosphorus to Unquity Brook including point and nonpoint sources of pollution.

- Continue to monitor pathogen levels in Unquity Brook to determine if the ongoing sewer and septic repair projects are effective (e.g., Milton Academy) in reducing fecal coliform levels in Unquity Brook.

- Work with the Town of Milton to continue to eliminate the discharge of raw sewage through sanitary sewer overflow (SSO) locations and to minimize the immediate impacts of these current overflows.

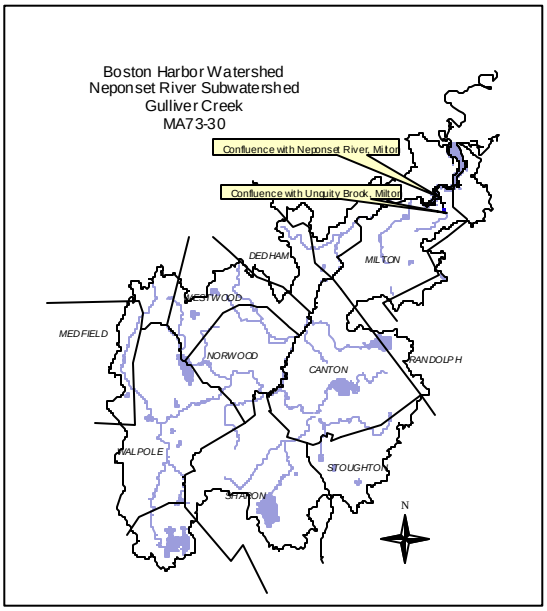
- Work with NepRWA to conduct a citizen outreach education workshop to educate local residents and landowners about good stream stewardship (i.e., yard waste disposal practices, reduction of impervious services, and road runoff).

- Conduct a stream cleanup along this segment of the Unquity Brook.

- Work with the municipal highway departments to implement BMPs to reduce sediment inputs and trash and debris from road crossings.

GULLIVER CREEK (SEGMENT MA73-30)

Location: From confluence Unquity Brook to confluence Neponset River, Milton.
Segment Area: 0.02 square miles.
Classification: Class SB.



This segment is on the 1998 303(d) list of impaired waters for pathogens (MA DEP 1999a). This segment is located within the Neponset River ACEC (MA DEM August 2000).

The Neponset River once supported substantial American shad and river herring fisheries but obstructions and pollution basically eradicated them. Remnant populations of shad, river herring and rainbow smelt return each spring to the base of the first obstruction, the Baker Chocolate Dam (Milton Lower Falls Dam) in Milton Lower Falls (Brady, 2001). During 1989 and 1990, DMF monitored anadromous rainbow smelt spawning habitat in the Neponset River and Gulliver Creek. Spawning occurred below the Lower Mills Dam and habitat covered approximately 9,495 m^2 (Chase 1996). "The Neponset River contains one of the largest smelt runs in Massachusetts Bay and supports a viable fall and winter recreational fishery along Boston Harbor" (Chase 1996). Chase listed excessive algal growth on substrates, most probably due to nutrient loadings in the river, storm water and NPS discharges leading to sedimentation, and reduced water flow due to withdrawals, as factors affecting smelt spawning in the Neponset River and Gulliver Creek. A feasibility study for dam removal of the Milton Lower Falls Dam and the second obstruction, Tilestone and Hollingsworth Dam is underway. In anticipation of improved access to this system the Division [of Marine Fisheries] has been stocking both American shad and Blueback herring into the Neponset system. Since 1996, over 16,000 Blueback herring and almost 1000 American shad have been transported from other source systems and released into the upper Neponset River in Canton. The Neponset herring fishery is managed under state regulations (Brady, 2001).

WMA WATER WITHDRAWAL AND SURFACE NPDES DISCHARGE SUMMARY:

There are no regulated water withdrawals or wastewater discharges in this segment. However, all communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

SHELLFISHING

The DMF Shellfish Status Report of October 2000 indicates that shellfish growing area GBH3.0 is prohibited (DFWELE 2000b).

Based on this information the *Shellfishing Use* is assessed as non-support for the entire 0.02 mi^2 of Gulliver Creek.

Gulliver Creek (MA73-30) Use Summary Table

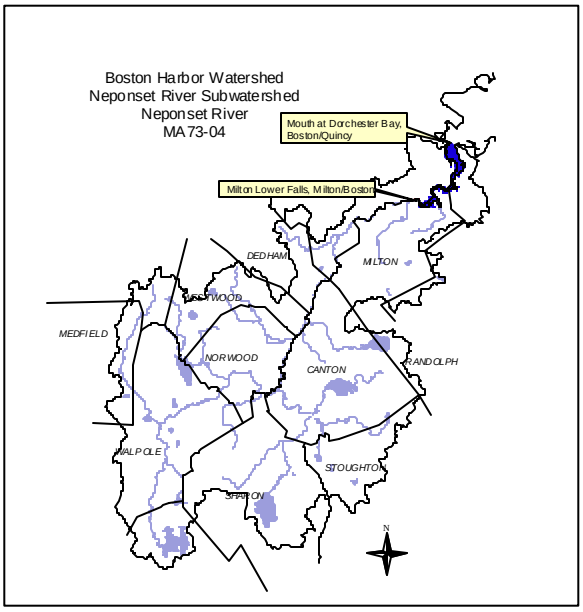
Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		NOT ASSESSED				
Fish Consumption		NOT ASSESSED				
Shellfishing		NON-SUPPORT 0.02 mi^2 For watershed-wide shellfish growing area data see Appendix E.				
Primary Contact		NOT ASSESSED				
Secondary Contact		NOT ASSESSED				
Aesthetics		NOT ASSESSED				

RECOMMENDATIONS GULLIVER CREEK (MA73-30)

- Continue to monitor pathogen levels in Unquity Brook to determine if the ongoing sewer and septic repair projects are effective (e.g., Milton Academy) in reducing fecal coliform levels in Unquity Brook and therefore downstream in Gulliver Creek.

NEPONSET RIVER (SEGMENT MA73-04)

Location: Milton Lower Falls Dam, Milton/Boston to mouth at Dorchester Bay, Boston/Quincy
Segment Area: 1.0 square miles.
Classification: Class SB, Shellfishing (Restricted), CSO*
(*In the updated 2002 SWQS, the CSO designation will be removed from the Neponset River. See Classification section.)



This segment is on the 1998 303(d) list of impaired waters for organic enrichment/ low DO, pathogens, turbidity (MA DEP 1999a). This segment of the Neponset River is located within the Neponset River Estuary ACEC (MA DEM August 2000). There is a large (~55 acre) landfill adjacent to the Neponset River on the north west side by Route 93 that has been capped, closed, and turned into Pope John Paul Park (Appendix F).

The Neponset River once supported substantial American shad and river herring fisheries but obstructions and pollution basically eradicated them. Remnant populations of shad, river herring and rainbow smelt return each spring to the base of the first obstruction, the Baker Chocolate Dam (Milton Lower Falls Dam) in Milton Lower Falls (Brady, 2001). During 1989 and 1990, DMF monitored anadromous rainbow smelt spawning habitat in the Neponset River and Gulliver Creek. Spawning occurred below the Lower Mills Dam and habitat covered approximately 9,495 m^2 (Chase 1996). "The Neponset River contains one of the largest smelt runs in Massachusetts Bay and supports a viable fall and winter recreational fishery along Boston Harbor" (Chase 1996). Chase listed excessive algal growth on substrates, most probably due to nutrient loadings in the river, storm water and NPS discharges leading to sedimentation, and reduced water flow due to withdrawals, as factors affecting smelt spawning in the Neponset River and Gulliver Creek. A feasibility study for dam removal of the Milton Lower Falls Dam and the second obstruction, Tilestone and Hollingsworth Dam is underway. Preliminary results indicate that approximately 8,000 cubic yards of contaminated sediments are impounded behind the two dams (ACOE October 31 2001). Discussion of alternate analysis and completion of the feasibility study is ongoing. In anticipation of improved access to this system the Division of Marine Fisheries has been stocking both American shad and blueback herring into the Neponset system. Since 1996, over 16,000 blueback herring and almost 1,000 American shad have been transported from other source systems and released into the upper Neponset River in Canton. The Neponset herring are managed under state Regulations (Brady, 2001).

WMA WATER WITHDRAWAL SUMMARY (APPENDIX G, TABLE G1):

Facility	PWS ID#	WMA Permit #	WMA Registration #	Source G = ground	Authorized Withdrawal (MGD)	1999 Average Withdrawal (MGD)
Wollaston Recreational Facility			31924302	Irrigation Pond and well	0.16	0.06

SURFACE NPDES DISCHARGE SUMMARY:

There were formerly two Boston Water & Sewer CSO outfalls discharging to the Neponset River. Sewer separation work has been completed in these areas and the outfalls have been eliminated as of February 2001.

All communities in the Boston Harbor Watershed (excluding Boston) are required to obtain Phase II NPDES storm water general permit coverage for their municipal drainage systems. EPA is currently writing this general permit (with input from DEP) and a preliminary draft is currently available for internal

review. The draft for public comment should be available by the end of June 2002. The final version of the Phase II storm water general permit for regulated small municipal separate storm sewer systems (MS4) will be issued by December 9, 2002. The towns must submit applications for coverage under the permit to EPA by March 10, 2003 (Scarlet 2002).

USE ASSESSMENT

AQUATIC LIFE

MWRA collected water quality samples at six stations between 1996 and 2000 as part of their ongoing receiving water monitoring program (Coughlin 2002):

054- Neponset River at Granite Ave Bridge
042- Neponset River between Neponset and T-Bridge
110- Neponset River, Pine Neck Creek (off Tenean Beach)
122- Neponset River at Port Norfolk Yacht Club Pier
089- Neponset River at Commercial Point (Victory Rd footbridge)
041- Dorchester, Old Colony Yacht Club)

Parameters measured included DO, percent saturation, temperature, and turbidity (Coughlin 2002).

DO

MWRA dissolved oxygen concentrations ranged from 1.02 to 12.54 mg/L with only 41 of the 609 samples less than 0.5 mg/L. Percent saturations ranged between 10.5 and 124.9% with 31 less than 60% and 19 greater than 115% (n=615). Samples were not collected pre-dawn and, therefore, these data do not represent worst-case conditions.

Temperature

All temperature measurements were below the SWQS for a Class B waterbody (n=620).

Turbidity

MWRA turbidity readings ranged between 0 and 34 NTU with an average of 5.65 NTU (n=412).

Historically this segment of the Neponset River has been assessed as non-support for the *Aquatic Life Use* due organic enrichment/low DO, elevated levels of metals in the water column and sediments, and other organics in sediments which were largely attributed to CSO discharges. More recent water quality data suggest improvements in oxygen concentrations, although, low DO levels near the Commercial Point CSO are still detected somewhat frequently (approximately 19% of the samples collected). While water quality conditions appear to be improving with the MWRA CSO elimination program, sediment quality remains a concern; therefore, the *Aquatic Life Use* is unassessed at this time.

FISH CONSUMPTION

In 1998, MDPH issued an advisory concerning consumption of seafood from Boston Harbor, including Quincy Bay (Celona 2001):

> "Lobster tomalley—all persons should eliminate consumption of the lobster tomalley (liver). This recommendation applies to tomalley from lobsters from any source due to the finding of abnormally high chemical contaminant levels…
>
> Boston Harbor Fishery Products—Pregnant and breast –feeding women, women who intend to become pregnant, children under the age of 12, and individuals with lowered immunity should avoid consuming certain fishery products from Boston Harbor. This applies to lobster, flounder, soft-shell clams and other bivalves…"

Based on the MDPH seafood fish consumption advisory, the *Fish Consumption Use* is assessed as non-support for this segment of the Neponset River.

SHELLFISHING

The DMF Shellfish Status Report of October 2000 indicates that shellfish growing areas GBH3.0 and GBH3.4 are prohibited (DFWELE 2000b).

Based on this prohibited status of the growing areas, the *Shellfishing Use* is assessed non-support for this entire segment of the Neponset River.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION

MWRA collected fecal coliform bacteria samples at their six water quality monitoring stations as part of their ongoing receiving water monitoring program on this segment of the Neponset River (Coughlin 2002). Samples were collected during both wet and dry weather conditions. Fecal coliform bacteria counts ranged from <5 to 1,070,000 cfu/100mL (n=629) with 92 counts greater than 2,000cfu/100mL, 82 greater than 4,000cfu/100mL and 67 counts greater than 10,000cfu/100mL. The highest count was recorded at station 089 (Commercial Point) and was collected during August 1996 in dry weather conditions. During the primary contact season, fecal coliform bacteria counts ranged between <5 to 1,070,000 cfu/100mL with 211 counts greater than 400cfu/100mL (43%). Of the six stations sampled, the highest counts were from station 089 with 68 of the 131 samples greater than 4,000 cfu/100mL (52%).

MWRA collected weekly fecal coliform bacteria samples between 12 June 1996 and 21 September 2000 at three stations at Tenean Beach: MDC26, North; MDC27, Middle; MDC28, South. At these three stations, bacteria counts ranged from <5 to 9,400 cfu/100mL (Coughlin 2001b). Percentages of counts above the *Primary* and *Secondary Recreational Use* guidance are presented below in Table 8.

Table 8. Percentages Of Bacteria Count Above The *Recreational Use* Guidance Collected By MWRA From Three Stations At Tenean Beach

Station	Percent greater than 400 cfu/100mL	Percent greater than 2000 cfu/100mL	Percent greater than 4000 cfu/100mL
MDC26 (n=325)	13%	4%	2%
MDC27 (n=307)	17%	3%	1%
MDC28 (n=315)	17%	5%	2%

Additionally, between 1996 and 2000, MDC issued 100 bathing advisories for Tenean Beach. These advisories were based upon the average fecal coliform bacteria and Enterococcus colony enumerations from three stations along the beach (Coughlin and Stanley 2001).

Based on elevated fecal coliform bacteria counts during wet and dry weather conditions and multiple bathing beach advisories, the *Primary* and *Secondary Contact Recreational uses* are assessed as non-support.

AESTHETICS

Trash and debris have been identified in this segment of the Neponset River including old sunken barges (NepRWA 2002). MWRA collected Secchi disk transparencies from five of their receiving water monitoring stations between 1996 and 2000. Secchi disk depths (n=330) ranged from 0.2 to 6 m with 112 readings less than 1.2m. The disk could be seen all the way to the bottom on 15 occasions.

Based on the evidence of trash and debris and poor water clarity, the *Aesthetics Use* for this segment of the Neponset River is assessed as partial support.

Neponset River (MA73-04) Use Summary Table

Designated Uses		Status	Causes		Sources	
			Known	Suspected	Known	Suspected
Aquatic Life		NOT ASSESSED				
Fish Consumption		NON-SUPPORT	Unknown		Unknown	
Shellfishing		For watershed-wide shellfish growing area data see Appendix E.				
Primary Contact		NON-SUPPORT	Pathogens		Urban runoff/ storm sewers, CSOs	
Secondary Contact		NON-SUPPORT	Pathogens		Urban runoff/ storm sewers, CSOs	
Aesthetics		PARTIAL SUPPORT	Trash and debris		Urban runoff/ storm sewers	

RECOMMENDATIONS NEPONSET RIVER (MA73-04)

- Work with NepRWA to conduct a citizen outreach education workshop to educate local residents and landowners about good stream stewardship (i.e., yard waste disposal practices, reduction of impervious services, and road runoff).

- Conduct a stream cleanup along this segment of the Neponset River.

- Work with the highway departments to implement BMPs to reduce sediment inputs and trash and debris from road crossings.

- Work with MWRA to continue to monitor pathogen levels in this segment of the Neponset River to determine if the elimination of the Boston Water & Sewer CSO outfalls and sewer separation projects are effective in reducing fecal coliform bacteria counts.

- Review results of the MWRA's *Final 1998 CSO Sediment Synthesis Report*.

NEPONSET RIVER SUBWATERSHED - LAKE ASSESSMENTS

A total of 65 lakes, ponds or impoundments (the term "lakes" will hereafter be used to include all) have been identified and assigned PALIS code numbers in the Neponset River Subwatershed (Ackerman 1989 and MA DEP 2001b). These lakes represent a total surface area for the Neponset River Subwatershed lakes of 1,922 acres. They range in size from one to 397 acres; 57 lakes are less than 50 acres and five are greater than 200 acres. Information on 33 of the lakes are reported here and stored in the WBS database. The other 32 lakes, which total 184 acres, are unassessed, and they are not currently included as segments in the WBS database.

Lake assessments are based on information gathered during DWM surveys (recent and historic) as well as pertinent information from other reliable sources (e.g., abutters, herbicide applicators, diagnostic/feasibility studies, MDPH, etc.). The 33 lakes assessed in this report represent 1,738 of the 1,922 or 90% of the acreage in the Neponset River Subwatershed (Figure 17).

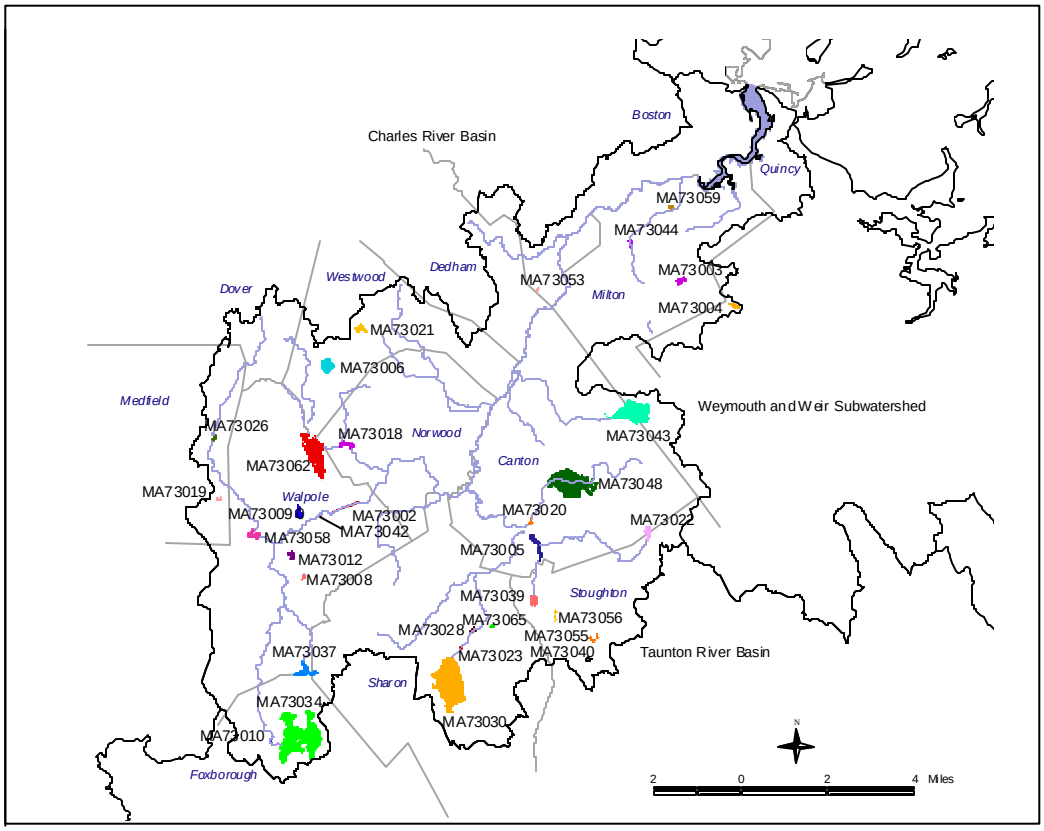


Figure 17. Lake Segments in the Neponset River Subwatershed

The 1994 DWM synoptic surveys focused on visual observations of water quality and quantity (e.g., water level, sedimentation, etc.), the presence of native and non-native aquatic plants (both distribution and areal cover) and presence/severity of algal blooms (Appendix B, Table B2 and B9). During 1999, more intensive in-lake sampling was conducted by DWM in three lakes in the Neponset River basin as part of the TMDL program. This sampling included in-lake measurements of dissolved oxygen, pH, temperature, Secchi disk transparency, nutrients, and chlorophyll *a*, as well as detailed macrophyte mapping (Appendix B, Tables B4 and B6). While these surveys provided additional information to assess the status of the designated uses, fecal coliform bacteria data were unavailable and, therefore, the *Primary Contact Recreational* Use was usually not assessed. In the case of the *Fish Consumption Use*, fish consumption advisory information was obtained from the MDPH (MDPH 2001a).

During the June 1994 DWM synoptic survey it was noted that Plimpton Pond South had been drained. As no new information is available, the use assessments of Plimpton Pond South are not attainable.

The use assessments and supporting information were entered into the EPA WBS database. Data on the presence of non-native plants were entered into an informal DWM non-native plant tracking database.

TROPHIC STATUS EVALUATION

Lakes are dynamic ecosystems that over time undergo a process of succession from one trophic state to another. Under natural conditions most lakes move from a nutrient poor (oligotrophic) condition through an intermediate (mesotrophic) stage of nutrient availability and biological productivity to a nutrient-rich or highly productive (eutrophic) state. For the purposes of this report trophic status was estimated primarily using visual observations of macrophyte cover and phytoplankton populations observed in 1994 by DEP DWM. Occasionally, older data from more detailed diagnostic studies were utilized. A more definitive assessment of trophic status would require more extensive collection of water quality and biological data.

The trophic status estimates for the lakes assessed (total acreage 1,738) in the Neponset River Subwatershed are presented in Table 9. Two lakes were mesotrophic, 14 lakes (13% of the assessed lake acreage) were eutrophic, and one lake was hypereutrophic. The trophic status was undetermined in 17 of the 33 lakes representing 51% of the assessed lake acreage.

Table 9. Neponset River Basin Lake Trophic Status Evaluation (**Bold indicates 1998 303(d) listed**).

Lake	Waterbody Identification Code (WBID)	Class	Size (Acres)	Trophic Status Estimate
Billings Street / East Street Pond, Sharon	MA73065	B	3.0	Eutrophic
Russell Pond (Pine Tree Pond), Milton	MA73003	B	6.0	Eutrophic
Bolivar Pond, Canton	MA73005	B	22.0	Eutrophic
Clark Pond, Walpole	MA73008	B	6.0	Eutrophic
Cobbs Pond, Walpole	MA73009	B	24.0	Eutrophic
Ellis Pond, Norwood	MA73018	B	19.0	Eutrophic
Ganawatte Farm Pond, Walpole / Sharon / Foxborough	MA73037	B	55.0	Eutrophic
Lymans Pond, Westwood	MA73021	B	26.0	Eutrophic
Manns Pond, Sharon	MA73028	B	11.0	Eutrophic
Neponset Reservoir, Foxborough	MA73034	B, WW	268.0	Hypereutrophic
Pinewood Pond, Stoughton	MA73039	B	21.0	Eutrophic
Farrington Pond (Plain Street Pond), Stoughton	MA73040	B	5.0	Eutrophic
Sprague Pond, Boston / Dedham	MA73053	B	13.0	Mesotrophic
Woods Pond (Stoughton Pond), Stoughton	MA73055	B	21.0	Eutrophic
Town Pond, Stoughton	MA73056	B	6.0	Eutrophic
Turner Pond, Walpole	MA73058	B	17.0	Mesotrophic
Turners Pond, Milton	MA73059	B	11.0	Eutrophic

AQUATIC LIFE

The Foxborough Company, a former metal plating and manufacturing company that currently is involved in light manufacturing and electronic assembly, historically discharged process wastewater and sanitary wastewater to the inlet stream of the Neponset Reservoir. The process discharge was connected to the Mansfield WWTP in 1987 and the sanitary discharge was connected in 1989. In 1994, the facility went to a closed-loop system, eliminating its Non-Contact Cooling Water (NCCW) discharge. Neponset Reservoir, headwaters of the Neponset River, received the treated process wastewater discharge from Foxborough Company for many years. This discharge has led to the contamination of the sediments in the reservoir with heavy metals. The reservoir is currently classified by MA DEP as a (4-0011387) Tier 1A, Phase II hazardous waste site.

The May 1998 Phase I investigation Report of the Neponset Reservoir found that cadmium and a number of other metals in the sediments exceeded the Massachusetts Contingency Plan Stage I screening levels that are used to judge if there is potential for exposure (Menzie-Cura & Associates 2001). Because of these findings a Stage II Risk Characterization was performed. DEP approved the Phase II Comprehensive Site Assessment and environmental risk characterization in May of 1998. Through this work the specific constituents of concern were identified (metals, cyanide and volatile organic chemicals). Through four assessment endpoints and associated measurement endpoints the following conclusions were made:

- There was no physical evidence of a continuing release of oil and/or hazardous material to the surface waters which significantly affects Environmental Receptors
- There is no evidence of biologically significant harm associated with current or future exposure of wildlife, fish, shellfish or other aquatic biota to oil and/or hazardous material at or from the site.
- Concentrations of oil and/or hazardous material at or from the disposal site do not and are not likely to exceed any applicable environmental standards
- There is no indication of the potential for biologically significant harm either currently or in the future to Environmental Receptors considering their potential exposures to oil and/or hazardous material and the toxicity of oil and/or hazardous material

A lake management strategy, recommended by the Lake Management Committee and adopted by the Sharon Selectmen, is to control the lake's surface water temperature. This thermally stratified lake typically has summer surface temperatures at or below 83°F. The Town determined that blue green algae responsible for swimmers' ear infections begin to thrive at 85ºF. Discharge from the lake is regulated in the summer months to reduce surface temperatures for human health concerns. The Town is required to release 1.7 cfs from the lake for protection of downstream wetlands (ACOE 1998).

Non-native (exotic) aquatic macrophytes were observed in 15 of the 33 lakes surveyed by DWM in 1994 (Appendix B, Table B9). Non-native aquatic macrophyton species observed in the Neponset River Subwatershed lakes included: *Myriophyllum heterophyllum* (variable water milfoil), *Cabomba caroliniana* (fanwort), *Myriophyllum spicatum* (Eurasian water milfoil), *Marsilea quadrifolia* (Pepperwort), *Potamogeton crispus* (curly pond weed), and *Trapa natans (water chestnut).* These species have high potential for spreading and are likely to have established themselves in downstream lake and river segments in the Neponset River Subwatershed, which may not have been surveyed. Table 10 indicates where these non-native aquatic species were observed (in bold) during the DWM 1994 and/or 1999 surveys and the likely, or potential, avenues of downstream spreading. The *Aquatic Life Use* for these 15 lakes is impaired (partial or non-support) based on the presence of non-native (exotic) aquatic macrophytes.

Two non-native wetland species, *Lythrum salicaria* (purple loosestrife) and *Phragmites australis* (reed grass), were identified at 17 (51%) of the 33 lakes surveyed by DWM in 1994 and/or 1999 (Appendix B, Tables B2 and B9). Although the presence of these species is not generally a cause of impairment to lakes, their invasive growth habit can result in the impairment of wetland habitat associated with lakes.

During the 1999 DWM baseline lakes survey of Ganawatte Farm Pond (MA73037) dissolved oxygen concentrations were below two mg/L on all three sampling events (Appendix B, Table B4). Additionally, during the weed mapping survey, dense aquatic plants covered 100% of the water's surface. Ganawatte Farm Pond is assessed as non-support for the *Aquatic Life Use* as a result of organic enrichment/low dissolved oxygen and noxious aquatic plants.

During the DWM 1999 surveys dissolved oxygen concentrations at the bottom of Turners Pond (MA73059) were less than 0.2 mg/L and surface waters were supersaturated (>115% saturation). In six of the eight samples analyzed for total phosphorus (as P) the levels were greater than 0.5 mg/L. The *Aquatic Life Use* for Turners Pond is assessed as non-support due to organic enrichment/low dissolved oxygen, high levels of nutrients, and high turbidity.

Water quality sampling in Cobbs Pond in 1999 indicated elevated nutrient concentrations and evidence of organic enrichment including dense cover of aquatic plants (Appendix B, Tables B6 and B9). The *Aquatic Life Use* was, therefore, assessed as non-support for the entire 24 acres of Cobbs Pond.

Although the causes of impairment to the above three ponds are unknown, urban runoff /storm water is suspected.

Table 10. Non-Native (Exotic) Aquatic Plant Species Locations (**In Bold**) In The Neponset River Subwatershed And Their Possible Paths Of Downstream Spreading (Appendix B, Table B9).

Cabomba caroliniana **(Fanwort)**

Bolivar Pond (Canton) ⇒ Forge Pond (Canton) ⇒ East Branch ⇒ Neponset River (through the Neponset River Reservation, Milton/Canton/Dedham)

Ellis Pond (Norwood) ⇒ Hawes Brook (through a small unnamed pond) ⇒ Neponset River (through the Neponset River Reservation, Milton/Canton/Dedham)

Manns Pond (Sharon) ⇒ Massapoag Brook (through Trowel Shop Pond, Sharon, Shepard Pond, Canton, and a small unnamed pond, Canton) ⇒ Forge Pond (Canton) ⇒ East Branch ⇒ Neponset River (through the Neponset River Reservation, Milton/ Canton/Dedham)

Town Pond (Stoughton) ⇒ unnamed tributary (through an unnamed pond, Stoughton) ⇒ Steep Hill Brook ⇒ Bolivar Pond (Canton) ⇒ Forge Pond (Canton) ⇒ East Branch ⇒ Neponset River (through the Neponset River Reservation, Milton/ Canton/Dedham)

Turner Pond (Walpole) ⇒ unnamed tributary ⇒ Neponset River (through Stetson Pond, Plimpton Pond, and Bird Pond, Walpole, and the Neponset River Reservation, Milton/Canton/Dedham)

Myriophyllum heterophyllum **(Variable water milfoil)**

Billings St./East St. Pond (Sharon) ⇒ unnamed tributary ⇒ Massapoag Brook (through Trowel Shop Pond, Sharon, Shepard Pond, Canton, and a small unnamed pond, Canton) ⇒ Forge Pond (Canton) ⇒ East Branch ⇒ Neponset River (through the Neponset River Reservation, Milton/ Canton/Dedham)

Clark Pond (Walpole) ⇒ unnamed tributary ⇒ Diamond Pond (Walpole) ⇒ unnamed tributary ⇒ Memorial Pond (Walpole) ⇒ unnamed tributary ⇒ Neponset River (through Stetson Pond, Plimpton Pond, and Bird Pond, Walpole, and the Neponset River Reservation, Milton/Canton/Dedham)

Farrington Pond (Stoughton) ⇒ unnamed tributary ⇒ another unnamed tributary (through an unnamed pond, Stoughton) ⇒ Town Pond (Stoughton) ⇒ unnamed tributary (through an unnamed pond, Stoughton) ⇒ Steep Hill Brook ⇒ Bolivar Pond (Canton) ⇒ Forge Pond (Canton) ⇒ East Branch ⇒ Neponset River (through the Neponset River Reservation, Milton/ Canton/Dedham)

Neponset Reservoir (Foxborough) ⇒ unnamed tributary ⇒ Crackrock Pond (Foxborough) ⇒ Neponset River (through several small unnamed ponds; Stetson Pond, Plimpton Pond, and Bird Pond, Walpole; and the Neponset River Reservation, Milton/Canton/Dedham)

Ponkapoag Pond (Canton) ⇒ unnamed tributary (through a small unnamed pond) ⇒ Neponset River (through the Neponset River Reservation, Milton/Canton/Dedham)

Myriophyllum spicatum **(Eurasian water milfoil)**

Ponkapoag Pond (Canton) ⇒ unnamed tributary (through a small unnamed pond) ⇒ Neponset River (through the Neponset River Reservation, Milton/Canton/Dedham)

Marsilea quadrifolia **(Pepperwort)**

Manns Pond (Sharon) ⇒ Massapoag Brook (through Trowel Shop Pond, Sharon, Shepard Pond, Canton, and a small unnamed pond, Canton) ⇒ Forge Pond (Canton) ⇒ East Branch ⇒ Neponset River (through the Neponset River Reservation, Milton/ Canton/Dedham)

Trapa natans **(Water chestnut)**

Clark Pond (Walpole) ⇒ unnamed tributary ⇒ Diamond Pond (Walpole) ⇒ unnamed tributary ⇒ Memorial Pond (Walpole) ⇒ unnamed tributary ⇒ Neponset River (through Stetson Pond, Plimpton Pond, and Bird Pond, Walpole, and the Neponset River Reservation, Milton/Canton/Dedham)

FISH CONSUMPTION

The MDPH fish consumption advisory list contains the status of each waterbody for which an advisory has been issued. If a water body is not on the list, it may be because either an advisory was not warranted or the water body has not been sampled. MDPH's most current Fish Consumption Advisory list is available online at http://www.state.ma.us/dph/beha/fishlist.htm.

The MDPH Fish Consumption List includes three ponds in the Neponset River Subwatershed: Bird, Plimpton, and Willet ponds.

Bird and Plimpton ponds are impoundments of the Neponset River between the Hollingsworth & Vose Dam in Walpole and the Tilestone Dam in Boston (Hyde Park). The advisories, issued due to elevated levels of PCBs in fish tissue, recommend the following (MDPH 2001a):

1. Children younger than 12 years, pregnant women, and nursing mothers should not eat any brown bullhead from the Neponset River.
2. The general public should limit consumption of brown bullhead from Neponset River to two meals per month.

The *Fish Consumption Use* for Bird Pond is assessed as non-support due to elevated levels of PCBs in fish tissue.

In July and August 1994 fish toxics monitoring (metals, PCB, and organochlorine pesticide in edible fillets) was conducted by DWM in Willet Pond. These data are presented in *The Neponset River Watershed 1994 Resource Assessment Report* (Kennedy *et al.* 1995). Because of elevated mercury concentrations, MDPH issued a fish consumption advisory for Willet Pond recommending the following (MDPH 2001a):

1. Children younger than 12 years, pregnant women, and nursing mothers should not eat any largemouth bass from Willet Pond.
2. The general public should limit consumption of largemouth bass from Willet Pond to two meals per month.

Willet Pond in Walpole/Norwood/Westwood, and Bird Pond in Walpole are impaired (non-support) for the *Fish Consumption Use* (Table 11).

In July 2001, MDPH issued new consumer advisories on fish consumption and mercury contamination. The MDPH "…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, MDPH 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" (MDPH 2001b).

Additionally, MDPH "…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" (MDPH 2001b).

MDPH's statewide advisory does not include fish stocked by the state Division of Fisheries and Wildlife or farm-raised fish sold commercially. The advisory encompasses all freshwaters in Massachusetts and, therefore, the *Fish Consumption Use* for lakes in the Neponset River Basin cannot be assessed as support or partial support.

PRIMARY AND SECONDARY CONTACT RECREATION AND AESTHETICS

All three lakes surveyed by DWM in the Neponset River Subwatershed in 1999 exceeded the Secchi disk depth bathing beach criterion (Appendix B, Table B6). In the absence of fecal coliform bacteria and Secchi disk depth data in other lakes the assessment of the recreational uses was based primarily on the synoptic survey information described above. Depending upon the severity of these conditions the recreational and aesthetics uses were assessed as either partial or non-support. Where no objectionable conditions were noted the *Primary Contact Recreational Use* was not assessed due to the lack of fecal coliform bacteria data.

No lakes in the Neponset River Basin were assessed as supporting the *Primary Contact Recreational Use*. The *Primary Contact Recreational Use* was impaired (partial or non-support) for the seven lakes (408 acres; 23% of the total acreage) assessed in the Neponset River Subwatershed (Table 11). Causes of impairment included noxious/overabundant plant growth (native and/or non-native {exotic} vegetation) and turbidity. Due to the lack of current available data (i.e., plant surveys and fecal coliform bacteria data), the *Primary Contact Recreational Use* was not assessed for the remaining 26 lakes (a total of 1,330 acres).

The *Secondary Contact Recreational* and *Aesthetics* uses were assessed as support in only one pond in the Neponset River Subwatershed (Turners Pond, Milton). Six of the assessed lakes (Table 11) had a high degree/density of macrophyte or algae cover that resulted in the *Secondary Contact Recreational* and *Aesthetic* uses being impaired (partial or non-support). These uses were not assessed for 25 lakes (1,303 acres).

SUMMARY

A total of 21 of the 33 lakes (63%) assessed in the Neponset River Subwatershed were impaired for one or more uses (Table 11). Causes of impairment included noxious (overabundant) plant growth (including both native and non-native {exotic} vegetation), mercury contamination, PCB contamination, organic enrichment/low dissolved oxygen, and turbidity. No lakes supported all uses nor were any assessed as support for either the *Aquatic Life* or *Primary Contact Recreational* uses. Nine lakes are currently not assessed for any use (Table 11).

With the exception of mercury and PCBs, these causes may reflect symptoms of lake eutrophication, a process of enrichment from excessive plant nutrients. Site-specific sources of impairment to the lakes in the Neponset River Subwatershed are largely unknown. However, nutrient enrichment from storm water runoff and failing/substandard sewage disposal systems are likely to have increased the macrophyte productivity resulting in impairments to the *Aquatic Life*, *Recreational,* and *Aesthetics* uses.

RECOMMENDATIONS – LAKES

- Coordinate with DEM and/or other groups conducting lake surveys to generate quality assured lakes data. Conduct more intensive lake surveys to better determine the lake trophic and use support status and identify causes and sources of impairment. As sources are identified within lake watersheds, they should be eliminated or, at least minimized through the application of appropriate point or non-point source control techniques.

- For non-native aquatic or wetland plant species that are isolated to one or a few location(s), quick action is advisable to manage these populations in order to alleviate the need for costly and potentially fruitless efforts to do so in the future. Two courses of action should be pursued concurrently. More extensive surveys need to be conducted, particularly downstream from these recorded locations (Table 5 and/or Table 10), to determine the extent of the infestation. Also, "spot" treatments (refer to the draft Generic Environmental Impact Report for Eutrophication and Aquatic Plant Management in Massachusetts [Mattson et al, 1998] for advantages and disadvantages) should be undertaken to control populations at these sites before they spread further. These treatments may be in the form of carefully hand-pulling individual plants in small areas. In larger areas, other techniques such as selective herbicide application may be necessary. In either case, the treatments should be undertaken prior to fruit formation and with a minimum of fragmentation of the individual plants. These cautions will minimize the spreading of the populations. This draft aquatic plant report (Mattson et al, 1998) should be consulted prior to the development of any lake management plan to control non-native aquatic or wetland plant species.

- As with the isolated cases, a program to manage the more extensive plant infestations should include additional monitoring efforts to determine the extent of the problem. The draft Generic Environmental Impact Report for Eutrophication and Aquatic Plant Management in Massachusetts (Mattson et al, 1998) should be consulted prior to the development of any lake management plan to control non-native aquatic plant species. Plant control options can be selected from several techniques (e.g., bottom barriers, drawdown, herbicides, etc.) each of which has advantages and disadvantages that need to be addressed for the specific site. However, methods that result in fragmentation (such as cutting or raking) should be discouraged because of the propensity for these plants to reproduce and spread vegetatively (from cuttings).

- Another important component of a management plan is prevention of further spreading of these plants. Once the extent of the problem is determined and control practices are exercised, vigilant monitoring needs to be practiced to guard against infestations occurring in unaffected areas and to ensure that managed areas stay in check. A key portion of the prevention program should be posting of boat

access points with signs to educate and alert lake-users to the problem and responsibility of spreading these species.

- Implement recommendations identified in the TMDLs and lake Diagnostic/Feasibility studies, including lake watershed surveys to identify sources of impairment.

- Investigate the downstream spread of the non-native *Myriophyllum heterophyllum* (variable water milfoil) in the following lakes: **Billings St./East St. Pond, Clark Pond, Neponset Reservoir, Ponkapoag Pond**

- Review data from "Beaches Bill" required water quality testing (bacteria sampling from all formal bathing beaches) to assess the status of the recreational uses; e.g., Blue Hills Pond (Milton), Massapoag Pond (Sharon), and Billings Street Pond (Sharon).

- The Memorial Pond Section 319 Phase I Restoration Project is part of a larger project to rehabilitate Memorial Pond in Walpole. This project will construct storm water BMPs at Stone Street and East and Diamond Streets which were identified in *Memorial Pond Investigation and Management Plan (1999)* as major sources of sediments and nutrients. A planned dredging project will remove sediments and nuisance aquatic vegetation and the outlet to the pond will be rebuilt to allow future drawdowns to control nuisance aquatic vegetation. Track progress of the Memorial Pond 319 Phase I Restoration Project.

Table 11. Neponset River Subwatershed Lake Assessments (**Bold indicates 1998 303(d) listed**).

LAKE	Waterbody Identification Code WBID	SIZE Acres	Aquatic Life *Causes*	Fish Consumption *Causes*	Primary Contact *Causes*	Secondary Contact *Causes*	Aesthetics *Causes*
Bird Pond, Walpole	MA73002	25.0	Not Assessed	NON-SUPPORT *PCBs*	Not Assessed	Not Assessed	Not Assessed
Russell Pond (Pine Tree Pond), Milton	MA73003	6.0	PARTIAL SUPPORT *Exotic Species*	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Blue Hills Reservoir, Quincy	MA73004	14.0	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Bolivar Pond, Canton	MA73005	22.0	PARTIAL SUPPORT *Exotic Species*	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Buckmaster Pond, Westwood	MA73006	27.0	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Clark Pond, Walpole	MA73008	6.0	NON-SUPPORT *Exotic Species*	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Cobbs Pond, Walpole	MA73009	24.0	NON-SUPPORT *Organic Enrichment Low D.O. Nutrients*	Not Assessed	NON-SUPPORT *Noxious Aquatic Plants Turbidity*	NON-SUPPORT *Noxious Aquatic Plants*	NON-SUPPORT *Noxious Aquatic Plants*
Crackrock Pond, Walpole	MA73010	14.0	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Memorial Pond (Diamond Pond), Walpole	MA73012	7.0	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Ellis Pond, Norwood	MA73018	19.0	PARTIAL SUPPORT *Exotic Species*	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Flynns Pond, Medfield	MA73019	8.0	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Forge Po nd, Canton	MA73020	25.0	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Lymans Pond, Westwood	MA73021	26.0	Not Assessed	Not Assessed	NON-SUPPORT *Noxious Aquatic Plants*	NON-SUPPORT *Noxious Aquatic Plants*	NON-SUPPORT *Noxious Aquatic Plants*
Glen Echo Pond, Canton/Stoughton	MA73022	16.0	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Hammer Shop Pond, Sharon	MA73023	4.0	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Jewells Pond, Medfield	MA73026	3.0	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed

Table 11. (Continued) Neponset River Subwatershed Lake Assessments (**Bold indicates 1998 303(d) listed**).

LAKE	Waterbody Identification Code WBID	SIZE Acres	Aquatic Life *Causes*	Fish Consumption *Causes*	Primary Contact *Causes*	Secondary Contact *Causes*	Aesthetics *Causes*
Manns Pond, Sharon	MA73028	11.0	PARTIAL SUPPORT *Exotic Species*	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Massapoag Pond, Sharon	MA73030	397.0	PARTIAL SUPPORT *Exotic Species*	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Neponset Reservoir, Foxborough	MA73034	268.0	PARTIAL SUPPORT *Exotic Species*	Not Assessed	NON-SUPPORT *Exotic Species Turbidity*	NON-SUPPORT *Exotic Species*	NON-SUPPORT *Exotic Species Turbidity*
Ganawatte Farm Pond, Walpole/Sharon/ Foxborough	MA73037	55.0	NON-SUPPORT *Organic Enrichment Low D.O. Noxious Aquatic Plants*	Not Assessed	Non-Support *Noxious Aquatic Plants Turbidity*	Non-Support *Noxious Aquatic Plants*	Non-Support *Noxious Aquatic Plants Turbidity*
Pinewood Pond, Stoughton	MA73039	21.0	NON-SUPPORT *Exotic Species*	Not Assessed	NON-SUPPORT *Exotic Species*	NON-SUPPORT *Exotic Species*	NON-SUPPORT *Exotic Species*
Plain Street Pond, (Farrington Pond) Stoughton	MA73040	5.0	PARTIAL SUPPORT *Exotic Species*	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Plimpton Pond South, Walpole	MA73042	5.0	Not Attainable	Not Attainable	Not Attainable	Not Attainable	Not Attainable
Ponkapoag Pond, Canton	MA73043	203.0	PARTIAL SUPPORT *Exotic Species*	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Popes Pond, Milton	MA73044	13.0	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Reservoir Pond, Canton	MA73048	243.0	PARTIAL SUPPORT *Exotic Species*	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Sprague Pond, Boston/Dedham	MA73053	13.0	Not Assessed	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Stoughton Pond, (Woods Pond) Stoughton	MA73055	21.0	PARTIAL SUPPORT *Exotic Species*	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Town Pond, Stoughton	MA73056	6.0	PARTIAL SUPPORT *Exotic Species*	Not Assessed	Not Assessed	Not Assessed	Not Assessed

Table 11. (Continued) Neponset River Subwatershed Lake Assessments (**Bold indicates 1998 303(d) listed**).

LAKE	Waterbody Identification Code WBID	SIZE Acres	Aquatic Life *Causes*	Fish Consumption *Causes*	Primary Contact *Causes*	Secondary Contact *Causes*	Aesthetics *Causes*
Turner Pond, Walpole	MA73058	17.0	PARTIAL SUPPORT *Noxious Aquatic Plants* *Exotic Species*	Not Assessed	Not Assessed	Not Assessed	Not Assessed
Turners Pond, Milton	MA73059	11.0	NON-SUPPORT *Organic Enrichment* *Low DO* *Nutrients*	Not assessed	PARTIAL SUPPORT *Turbidity*	SUPPORT	SUPPORT
Willet Pond, Walpole/Westwood/ Norwood	MA73062	200.0	Not Assessed	NON-SUPPORT *Mercury*	Not Assessed	Not Assessed	Not Assessed
Billings Street/ East Street Pond, Sharon	MA73065	3.0	NON-SUPPORT *Exotic Species*	Not Assessed	NON-SUPPORT *Exotic Species*	NON-SUPPORT *Exotic Species*	NON-SUPPORT *Exotic Species*