

**SuAsCo WATERSHED
2001 WATER QUALITY ASSESSMENT REPORT**

Prepared by:

**Katie A. O'Brien-Clayton
With assistance from Laurie E. Kennedy and Robert J. Maietta
Department of Environmental Protection
Division of Watershed Management**

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EXHIBIT 9

SUDBURY RIVER WATERSHED

The Sudbury River originates in Cedar Swamp as the outlet of Cedar Swamp Pond. Cedar Swamp was the first Area of Critical Environmental Concern designated in Massachusetts (July 1975). The approximately 1650 acres are primarily vegetated wetlands, providing critical floodwater storage capacity for the Sudbury River basin. The area overlays the medium- and high-yield aquifers that supply two public wells for Westborough, as well as public drinking water reservoirs downstream in Framingham. State-listed rare species occur in the area, as well as the uncommon Atlantic White Cedar swamp for which the area is named. From its headwaters the Sudbury flows east. It is joined by Whitehall Brook, which is the outlet stream of Whitehall Reservoir, a public water supply for the Town of Hopkinton. The Sudbury River flows through Ashland into Framingham. Indian Brook flows through Hopkinton Reservoir, a water supply for Ashland, and into the Sudbury. In Framingham the river flows through Reservoir #1 and 2 (back up water supplies) and into the Saxonville Impoundment. The river continues in a northerly direction toward its confluence with the Assabet River. Hop Brook, Wash Brook, and Pantry Brook in the Town of Sudbury and Pine Brook in Wayland contribute freshwater to the Sudbury River system. The only direct wastewater discharge to the main stem Sudbury River is the Wayland Waste Water Management District. However, there are several wastewater and storm water discharges to the tributaries, including the Marlborough Easterly Waste Water Treatment Plant that discharges to Hop Brook.

The Wild and Scenic Rivers Act provides for three possible classifications of eligible river segments: wild, scenic, and recreational. Based on ecology, history, literature, and scenery 14.9 miles of the Sudbury River, from the Danforth Street bridge in Framingham to the Route 2 bridge in Concord, have been designated as scenic by the National Park Service. The remaining 1.7 miles of the Sudbury River (Rt. 2 to confluence with the Assabet River at Egg Rock in Concord) have been classified as recreational (NPS 1996).

ISSUES

The towns of Ashland, Framingham, and Natick discharge sewage to the MWRA sewer system. Approximately 65% of the Town of Ashland is sewered, while 45% uses on-site septic systems (ENSR 2004a). Wastewater (about 2.2 MGD) is pumped to the Arthur Street pump station in Framingham and then on to the MWRA Deer Island WWTP in the Boston Harbor Watershed. Approximately 85% of Ashland uses public water (Unger 2004). Framingham is approximately 89% sewered while Natick is 80-85% sewered.

The Town of Wayland, with the exception of the area east of the former Raytheon plant down to Route 20 and across Route 27, is served by on-site septic systems. The Wayland Business Center WWTP treats wastewater from some homes and small businesses and discharges it to the Sudbury River (Segment MA82A-04).

The City of Marlborough, as discussed in the Assabet River Watershed section, is approximately 92% sewered. Wastewater is discharged from the Westerly Treatment Plant to the Assabet River and the Easterly Plant discharges to the Hop Brook system (Segment MA82A-15).

The communities of Westborough, Hopkinton, Holliston, Southborough, Ashland, Sherborn, Framingham, Sudbury, Wayland, Weston, Lincoln, and Concord are all partially regulated Phase II storm water communities. Marlborough is an entirely regulated community. Each community was issued a storm water general permit from EPA and MA DEP in 2003/2004 and is authorized to discharge storm water from their municipal drainage system. Over the five-year permit term the communities will develop, implement, and enforce a storm water management program to reduce the discharge of pollutants from the storm sewer system to protect water quality (Domizio 2004).

There are two National Priorities List (Superfund) sites within the Sudbury River Watershed: the Nyanza Superfund in Ashland and the Natick Labs site in Natick.

In the Sudbury River Watershed, the towns of Hopkinton and Southborough have participated in the Comprehensive Community Septic Management Program (Kasper-Dunne 2004).

There are 120 21E Tier Classified Sites in the Sudbury River Watershed (Appendix J).

USGS is currently conducting a habitat project at selected sites in the Sudbury River Watershed. As part of this project temperature loggers were deployed at 11 sites (5 tributaries, 4 mainstem) from May through November 2004 and MDFW conducted fish population sampling at five sites. USGS plans to leave the temperature loggers in place for the entire 2005 season.

RECOMMENDATIONS

- Throughout the Sudbury River Watershed bacteria monitoring should be conducted to document the effectiveness of bacteria source reduction activities associated with the Phase II community storm water management program and to assess the status of the *Primary* and *Secondary Contact Recreational* uses.
- Work with the Sudbury River Watershed Organization to collect quality-assured water quality data, to form stream teams throughout the watershed, and conduct shoreline surveys to assess the *Aesthetics Use*.
- When available, review the results from the USGS Habitat Project in the Sudbury River Watershed for pertinent information to assess the status of the *Aquatic Life Use*.

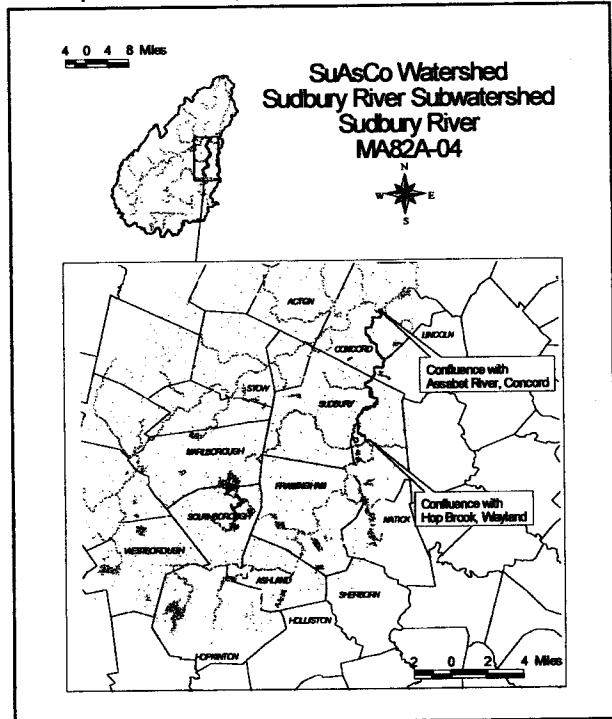
SUDBURY RIVER (SEGMENT MA82A-04)

Description: Confluence with Hop Brook, Wayland (the lower portion of Hop Brook was identified as Wash Brook on USGS quads prior to 1987), to confluence with Assabet River, Concord
 Segment Length: 11.7 miles
 Classification: Class B, Aquatic Life

Land-use estimates (top 3, excluding water) for the 162.5 mi² subwatershed (map inset, gray shaded area) are presented below. An estimate of the impervious area within this subwatershed is 19.4 mi² and the percentage of the imperviousness is 11.9%.

- Forest 40%
- Residential 33%
- Open Land 7%

Based on the last evaluation of water quality conditions, this segment of the Sudbury River is listed on the 2002 Integrated List of Waters in Category 5. This segment was assessed as impaired and requires a TMDL for metals (MA DEP 2003a).



WMA WATER WITHDRAWAL SUMMARY (APPENDIX E, TABLE E5)

Facility	WMA Permit Number	WMA Registration Number	Source (G = ground, S = surface)	Authorized Withdrawal (MGD)
Concord Water Department	9P31406701	31406704	3067000-01G -03G -06G	2.1 (reg) <u>0.42 (perm)</u> 2.52
Lincoln Water Department		31415701	3157000-02G	0.28
Wayland Water Department	9P431431501	314315002	3315000-01G -02G -06G -07G -08G	1.66 (reg)
Nashawtuck Country Club Inc.		31406708	01G (Sudbury Road Well) 01S (Sudbury RD W/D)	0.1
Concord Country Club		31406702	01G (Well #1)	0.12
Verrill Farm*		31406707	02S (Wheeler Road (w/d) 04S (Rte 117 #1 w/d)	0.06 (184 days)

* This facility's withdrawals have been under the WMA threshold and they have initiated discussion with MA DEP to give up their registration (Peters 2004).

NPDES WASTEWATER DISCHARGE SUMMARY (APPENDIX E, TABLES E1-E4)

Wayland Wastewater Management District Commission (MA0039853) is permitted (October 1998) to discharge 0.065 MGD of treated sanitary wastewater from the Wayland Business Center LLC WWTP via outfall 001 to a wetland and then to this segment of the Sudbury River. The flow limit included a watershed-based trading program to reduce phosphorus loadings to the Sudbury and its tributaries. The program would involve reducing phosphorus from nonpoint sources, specifically by allowing tie-ins from failing septic systems. The permit expired in October 2003. EPA will reissue this permit in 2005. This plant was taken by eminent domain by the Town of Wayland on 26 October 1999. The existing permit includes limits for BOD (30 mg/L), TSS (30 mg/L), total phosphorus (0.5 mg/L) and fecal coliform bacteria (200 cfu/100mL). Wayland is required to conduct one acute whole effluent toxicity test per year. The

facility's whole effluent toxicity limit is $LC_{50} \geq 100\%$ effluent. The owners were also required to conduct an instream monitoring program at points upstream and downstream from the discharge, but these data were not available. The facility uses UV light for disinfection.

Raytheon Co. (Wayland) went out of business and EPA terminated the NPDES permit (MA0001511) in April 1997. The remediation efforts from hazardous waste and oil contamination at the facility are in Phase V (Operation, Maintenance, and/or Monitoring) of a five-phase cleanup.

LANDFILLS (APPENDIX K)

There are three landfills located within this subwatershed. Two, the Sudbury Transfer Station and the Wayland Sand Hill Landfill, are still active.

USE ASSESSMENT

AQUATIC LIFE

Habitat and Flow

As part of the development of the nutrient TMDL for the Concord River ENSR collected two stream flow measurements on this segment of the Sudbury River off Thoreau Street in Concord. Stream flow on 23 July 2001 was 51.9 cfs and on 11 September 2001 was 29.20 cfs (ENSR 2003).

The non-native aquatic macrophyte *Trapa natans* (water chestnut) was identified in this segment of the Sudbury River, but the extent of the infestation is not well documented (no macrophyte mapping or biovolume estimates). It is believed that water chestnuts were first documented in the Sudbury River near Route 27 in Wayland in the 1950s and a floating mat still persists today (Marden 2005). The infestation has spread downstream and water chestnuts were first documented in Fairhaven Bay in the early 1990s (Marden 2005). The Lincoln Conservation Department has been harvesting water chestnuts from Fairhaven Bay since 2000. The harvesting is accomplished by using the weed harvester from the Great Meadows National Wildlife Refuge. In 2000 ten to fifteen acres of the approximately 75-acre Bay were covered with water chestnuts. In recent years the extent of the acreage covered is decreasing, but along the shallow shore areas floating mats still persevere (Gumbart 2005 and Marden 2005). The Wayland Surface Water Quality Committee also reports that the river is "heavily infested" between Route 27 in Wayland and the Sherman Bridge in Sudbury/Wayland and there are "some long stretches where there's only a 6-8 foot wide channel in the river {and} one section...below the confluence of the old part of the river below the four arch bridge, and the channelized section below the Route 27 bridge" is also heavily infested (Largy 2004). The USFWS has also confirmed heavy infestation between the Route 27 bridge and the Sherman Bridge (Koch 2005). Heard Pond is also infested with water chestnuts and during extreme high waters is connected to the Sudbury River (Largy 2004).

Biology

MDFW conducted fish population sampling at two stations in this segment of the Sudbury using boat electroshocking equipment. The fish community was sampled near River Road in Wayland (Station 389) on 6 July 2001 and at Lowell Road (Station 532) near the confluence with the Assabet and Concord rivers on 5 July 2001 (Richards 2003a).

At the River Road station 14 species (436 fish total) were collected including 187 yellow perch, 69 bluegill, 41 largemouth bass, 37 golden shiner, 22 pumpkinseed, 18 white sucker, 12 brown bullhead, 11 black crappie, ten common carp, eight white perch, seven chain pickerel, six American eel, six redfin pickerel, and two northern pike.

At Lowell Road 13 species were collected including (188 fish total) 72 yellow perch, 33 bluegill, 20 pumpkinseed, 16 common carp, 15 black crappie, 13 largemouth bass, five American eel, four white sucker, three chain pickerel, three white perch, two brown bullhead, one golden shiner, and one northern pike.

Although the total number of fish collected was high, macrohabitat generalists dominated both reaches sampled. Only one species, white sucker, is considered a fluvial specialist. All species present are considered moderately tolerant or tolerant to pollution. This segment of the Sudbury River is

predominately a slow-moving, meandering river with large areas of contiguous wetlands. Given the nature of this segment the dominance by a diverse mix of tolerant and moderately tolerant macrohabitat generalists is to be expected.

Toxicity

Effluent

Between October 1999 and October 2004 six whole effluent toxicity tests using the *C. dubia* and *P. promelas* were conducted on the Wayland Wastewater Management District effluent. With the exception of one test in October 1999 ($LC_{50} = 35.40\%$ effluent in *C. dubia* test) the effluent was not acutely toxic to the water flea (of the five valid tests) or the fathead minnow.

Ambient

Water was collected from the Sudbury River near the Route 20 bridge in Wayland for use as dilution water in the Wayland Wastewater Management District acute whole effluent toxicity tests. Survival of *C. dubia* was good (100%, 48 hour exposure) as was survival of *P. promelas* (>95%, 48 hour exposure).

Chemistry – water

Water was collected from the Sudbury River near the Route 20 bridge in Wayland for use as dilution water in the Wayland Wastewater Management District acute whole effluent toxicity tests. Data from these reports are maintained in the TOXTD database by DWM and are summarized below.

DWM conducted water quality monitoring in 2001 at four stations on this segment of the Sudbury River:

- SU11- Rte. 27 bridge in Wayland;
- SU12- Sherman Road bridge in Sudbury/Wayland;
- SU13- Rte. 117 bridge in Lincoln/Concord (only sampled on 10 July); and
- SU15- Nashawtuc Road bridge in Concord.

ENSR conducted *in situ* water quality sampling on this segment of the Sudbury River in July and August 2002 and July, August and September 2003 (see stations below). Parameters measured included temperature, pH, DO, and conductivity. Grab samples were also collected for nutrient analysis of ammonia-nitrogen and total phosphorus (ENSR 2004a).

- SR06- Bridge on Rte 20, Wayland
- SR05- Old Sudbury Road (Route 27 bridge), Wayland
- SR04- Sherman Bridge Road, Wayland
- SR03- Rte 117, Sudbury {Concord}
- SR02- Sudbury Road, Concord
- SR01- Bridge on Nashawtuc Road, Concord

ENSR also conducted water quality monitoring in this segment of the Sudbury River off Thoreau Street in Concord (Station SR) for the development of the Concord River nutrient TMDL. *In situ* samples were collected for DO, % saturation, temperature, pH, and conductivity. Grab samples were collected and analyzed for total phosphorus, ammonia-nitrogen, and TSS (ENSR 2003).

DO- Note: This segment is designated as "Class B, Aquatic Life", so Class C dissolved oxygen and temperature criteria apply. This designation is made only where background conditions prevent the attainment of a 'higher use' designation (MA DEP 1996).

DO concentrations (pre-dawn) measured by DWM ranged between 3.6 to 7.5 mg/L (n=9). Percent saturations ranged between 42 and 88% (n=9).

During the ENSR Sudbury study dissolved oxygen concentrations ranged between 2.3 and 11.1 mg/L with six of the 29 measurements less than 5.0 mg/L and two measurements less than 3.0 mg/L (note these were all on 22 August 2003). Percent saturations ranged from 29 to 145.2 % (n=29), although only two % saturations exceeded 110%. It should be noted that these data were collected between 0850 and 1740h. The lower DOs were measured in the morning while the highest DOs and saturation were in the later afternoon hours.

Dissolved oxygen concentrations reported by ENSR during the Concord TMDL study ranged from 2.2 to 8.8 mg/L, although only one measurement was less than 5.0 mg/L (n=8). Percent saturations ranged from 28.4 to 97.9% with only one measurement less than 60% saturation.

Temperature

Temperatures reported by DWM ranged between 21.7 and 25.2 °C (n=9). Temperatures measured by ENSR during the Sudbury survey ranged between 17.8 and 28.7°C (three of the 29 measurements exceeded 28.3°C). The highest temperatures were recorded in the river near Sudbury Road bridge (Station SR02). Temperatures reported by ENSR during the Concord TMDL survey ranged from 19.1 to 27.3°C (n=9).

pH

The pH of the Sudbury River near the Route 20 bridge (TOXTD database) ranged between 6.7 and 7.9 SU (n=6). pH values measured by DWM ranged from 6.5 to 7.2 SU (n=9). pH measured by ENSR during the Sudbury survey ranged between 6.1 and 7.6 SU (five of the 29 measurements were less than 6.5 SU) and the pH of the River measured by ENSR during the Concord TMDL study ranged from 6.5 to 7.7 SU (n=9).

Hardness

Hardness of the river near the Route 20 bridge (TOXTD database) ranged between 54 and 92 mg/l (n=6). Hardness measured by DWM in this segment of the Sudbury River ranged between 53 and 82 mg/L (n=8).

Alkalinity

Alkalinity of the river ranged between 14 and 58 (n=6 TOXTD database) while those measured by DWM ranged from 24 to 52 mg/L (n=8).

Conductivity

The conductivity of the river near the Route 20 bridge ranged between 360 and 490 µS/cm (n=6 TOXTD database). Specific conductance at 25°C as measured by DWM ranged between 385 and 522 µS/cm (n=9). Conductivity measured by ENSR as part of the Sudbury survey ranged between 386 and 500 µS/cm (n=29) with similar conductivities measured during the ENSR Concord TMDL study (range 358 to 412 µS/cm, n=8).

Total Suspended Solids

The total suspended solids concentrations of the river near the Route 20 bridge ranged from <5 to 40 mg/L with only one of the six measurements >25 mg/L (TOXTD database). Total suspended solids concentrations measured by DWM ranged between 6.0 and 11 mg/L (n=8). TSS concentrations measured during the ENSR Sudbury survey ranged between 2 and 21 mg/L (n=19) and between 1.5 and 12 mg/L during the Concord TMDL study (n=8).

Turbidity

Turbidity as reported by DWM ranged between 1.7 and 4.6 NTU (n=8).

Total Phosphorus

Total phosphorus concentrations measured by DWM ranged between 0.020 and 0.091 mg/L with seven of the nine samples having concentrations greater than 0.05 mg/L. Total phosphorus concentrations measured during the ENSR Sudbury survey ranged between 0.01 and 0.05 mg/L (n=19). Total phosphorus concentrations during the ENSR Concord TMDL survey ranged between <0.01 and 0.06 mg/L with two of the eight samples having concentrations greater than 0.05 mg/L.

Ammonia-nitrogen

No detectable concentrations of ammonia-nitrogen were reported in the samples of the river collected near the Route 20 bridge (n=6 TOXTD database). With the exception of the sample collected on 10 July at Station SU15 (0.08 mg/L), ammonia-nitrogen concentrations were less than 0.02 mg/L (n=9) during the DWM surveys. Ammonia-nitrogen concentrations in this segment of the Sudbury River during

the ENSR Sudbury survey ranged between <0.03 and 0.07 mg/L (n=19) and during the ENSR Concord TMDL survey concentrations ranged between <0.03 and 0.09 mg/L (n=8). All concentrations are below the EPA CCC for ammonia-nitrogen.

Total Residual Chlorine

With the exception of one measurement reported as <0.2 mg/L none of the other four TRC concentrations in the river near the Route 20 bridge exceeded 0.05 mg/L (n=5 TOXTD database).

Chemistry-sediment

USGS collected and analyzed sediment cores collected in the stream channel and at the bank at one site in the Sudbury River near Sherman Bridge Sudbury/Wayland (Station T2) in September and May 1995, respectively (Colman *et al.* 1999). The total mercury concentration in the channel core was highest (approximately 0.9 PPM dry-weight) at the top, and generally decreased to very low concentrations to the bottom of the core. The total mercury concentration in the bank core was highest at the top (approximately 3 PPM dry-weight) and decreased to low concentrations at the bottom of the core (Colman *et al.* 1999).

Surficial sediment samples were collected from three locations along this segment of the Sudbury River: near Sherman Street Bridge, Sudbury/Wayland (Station #6), from the Fairhaven Bay area in Concord/Lincoln (Station #7) and near the Thoreau Street Bridge, Concord (Station #8), in June 1994 as part of the caged mussel study. The mean concentrations of four analytes (total Hg – 0.5 ppm dry weight, Pb, As, and Cr) exceeded L-EL but not S-EL published in Persuad *et al.* 1993 at Station #6 while Cr was below the L-ELs and TOC was at the S-EL (Beckvar *et al.* 2000). The mean concentrations two analytes (As and TOC) exceeded their L-EL but not S-EL and the other analytes were below their L-ELs at Station #7 (total Hg was 0.07 ppm dry weight). At the most downstream sampling location the mean concentrations of all the analytes exceeded their L-ELs but were below the S-ELs (total Hg was 0.36 ppm dry weight) (Beckvar *et al.* 2000).

Surficial sediment samples were collected from the Sudbury River in the vicinity of the Route 27 bridge, Sudbury/Wayland, in July and September 1994 and from the Fairhaven Bay area in Concord/Lincoln in July and September 1994 and May and September 1995 as part of the bioaccumulation study being conducted with mayfly nymphs. The mean total mercury concentrations in the sediment collected from the river in the vicinity of the Route 27 bridge, Sudbury/Wayland, was 0.88 ppm and 1.92 ppm dry weight from samples collected in July and September 1994, respectively. The mean total mercury concentrations in the sediment collected from the Fairhaven Bay area ranged between 1.429 and 1.791 ppm dry weight (Naimo *et al.* 2000).

Chemistry-tissue

A caged mussel (*Elliptio complanata*) study was conducted from three locations along this segment of the Sudbury River- near Sherman Street Bridge, Sudbury/Wayland (Station #6), from the Fairhaven Bay area in Concord/Lincoln (Station #7) and near the Thoreau Street Bridge, Concord (Station #8), in June 1994. Three 35 organism replicate samplers (total of 105 mussels) per station were deployed for a twelve-week period at each location. Survival of the mussels was only 36% at Station #6 (caged mussels moved to a slightly different location from original deployment due to high mortality attributed to low dissolved oxygen conditions (Beckvar *et al.* 2000). Survival of caged minnows was 88 and 87% at Station #7 and #8, respectively. The mean total mercury concentrations in the mussel samples were 590, 400, and 340 ppb dry weight at stations #6, #7, and #8, respectively (Beckvar *et al.* 2000).

A bioaccumulation study using burrowing mayfly nymphs (*Hexagenia* sp.) exposed (21-day exposure) to sediment collected from the Sudbury River in the vicinity of the Route 27 bridge, Sudbury/Wayland, was conducted in July and September 1994. Sediments were also collected from the Fairhaven Bay section of the River in Concord/Lincoln in July and September 1994 and May and September 1995. Survival of the mayfly nymphs was greater than 90% in all tests conducted. The mean concentration of total mercury (gut contents not depurated) in the mayflies exposed to sediment collected near the Route 27 bridge was 759 and 762 ppb dry-weight for the July and September tests, respectively (Naimo *et al.* 2000). The mean concentration of total mercury in the mayflies exposed to Fairhaven Bay sediments ranged from 492 to 874 ppb dry-weight (Naimo *et al.* 2000).

Fish, dragonfly larvae, and prey fish were collected from the Sudbury River near Sherman bridge, Concord between May 1994 and 1995. Whole fish composite samples of black crappie (n=5 in May, n=5 in July, and n=6 in October 1994), bluegill (n=10 in all three sampling events), largemouth bass (n=10 in all three sampling events) were collected and analyzed for total mercury. The mean concentration of total mercury in the whole fish composite samples (adjusted for size) were 370 ppb wet weight in black crappie, 200 ppb wet weight in bluegill, and 690 ppb wet weight in largemouth bass. The mean concentration of total mercury in dragonfly larvae (n=19) was 313 ppb dry weight, and in prey fish (n=48) was 525 ppb dry weight (Haines *et al.* 2003).

The *Aquatic Life Use* for this segment of the Sudbury River is assessed as support based primarily on the fish community and the good survival of test organisms exposed to the river. This use is, however, identified with an Alert Status due to the identification of a non-native macrophyte (*Trapa natans*) in the river.

FISH CONSUMPTION

DWM conducted fish toxics monitoring in the Sudbury River in 1985, 1986, 1987, and 1988. Sampling in 1988 was conducted to confirm the results of previous studies and to investigate possible bioaccumulation of PCBs as indicated by 1986 USFWS data (Maietta 1990). Sources of mercury include the Nyanza Superfund Site. Based on DWM data that found elevated concentrations of mercury in fish tissue MDPH issued a fish consumption advisory for the Sudbury River from Ashland to the confluence with the Assabet and Concord rivers, including Stern and Bracket Reservoirs in Framingham. The advisory states:

1. The general public should not consume any fish from this waterbody.

The *Fish Consumption Use* is assessed as impaired due to MDPH site-specific fish consumption advisory because of mercury contamination.

PRIMARY CONTACT AND SECONDARY CONTACT RECREATION AND AESTHETICS






DWM collected fecal coliform and *E. coli* bacteria samples at their three water quality stations on this segment of the Sudbury River during dry weather conditions in July and September 2001 (Appendix A). Fecal coliform counts ranged between 55 and 95 cfu/100 mL (n=6).

As part of the Sudbury River bacteria survey ENSR collected fecal coliform and *E. coli* bacteria samples from their six water quality stations on 22 July 2002, 30 August 2002, and 29 July 2003. Additionally, samples were collected from stations SR01, SR04, and SR06 only on 16 September 2003 (ENSR 2004a). Fecal coliform bacteria counts from all stations ranged between <100 cfu/100mL to 13,300 cfu/100mL (n=21). Elevated counts were recorded during both wet (16 September 2003) and dry (22 July 2002) weather conditions with the highest count being recorded during wet weather at Station SR01, bridge on Nashawtuc Road, Concord. Nine of the 21 counts were greater than 400 cfu/100mL while seven of them also exceeded 2000 cfu/100mL.

As part of the Concord River nutrient TMDL assessment study ENSR also collected *E. coli* and fecal coliform bacteria samples from the Sudbury River near Thoreau Street in Concord between June 2001 and September 2001 (ENSR 2003). Fecal coliform bacteria counts ranged between 20 and 160 colonies/100mL (n=5).

Because of the limited fecal coliform bacteria dataset (too few samples collected in any given year) and lack of information as to the aesthetic quality of this segment of the Sudbury River, the *Primary* and *Secondary Contact Recreational* and *Aesthetic* uses are not assessed. The *Recreational* uses are identified with an Alert Status, however, because of the occasionally high bacteria counts.

Sudbury River (MA82A-04) Use Summary Table

Designated Uses		Status
Aquatic Life		SUPPORT*
Fish Consumption		IMPAIRED Causes: Mercury Sources: Nyanza Superfund Site (Suspected Sources: Atmospheric deposition)
Primary Contact		NOT ASSESSED*
Secondary Contact		NOT ASSESSED*
Aesthetics		NOT ASSESSED

* Alert Status issues identified, see details in use assessment section

RECOMMENDATIONS

- Conduct biological monitoring in this segment of the Sudbury to better evaluate the status of the *Aquatic Life Use*. Conduct an aquatic macrophyte weed mapping survey to document the extent of the water chestnut infestation throughout this segment of the river. Develop and implement a management strategy to reduce non-native plant infestation, if appropriate, and prevent the spread of non-natives downstream.
- Continue to review information developed as part of the Nyanza Superfund site investigations to evaluate restoration efforts when assessing the *Aquatic Life Use*.
- Continue to conduct bacteria monitoring along this segment to assess the status of the *Recreational Uses*. Efforts should be aimed at identifying and eliminating potential sources of bacterial contamination.
- Work to promote stewardship along this segment and create a stream team to conduct shoreline surveys to assess the status of the *Aesthetics Use*.