TEN MILE RIVER WATERSHED

2002 WATER QUALITY ASSESSMENT REPORT

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
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COLES BROOK (SEGMENT MA52-11)

Location: Headwaters, Grassie Swamp west of Allens Lane, Rehoboth, to inlet of Central Pond, Seekonk.
Segment Length: 4.2 miles
Classification: Class B.

Coles Brook flows in a southwesterly direction to the inlet of Central Pond (MA52006) in Seekonk, MA. The land use within this segment's subwatershed is low to medium density residential and forest. Additionally, Coles Brook flows through a country club property where the brook is impounded for a short distance in Seekonk, MA.

This segment is on the proposed Massachusetts Year 2004 Integrated List of Waters – Category 5, "Waters requiring a TMDL" - pollutants needing TMDL: flow alterations, pathogens (MassDEP 2005a).

DESIGNATED USE ASSESSMENT

Aquatic Life Use

Habitat and Flow

In July 2002 MassDEP DWM conducted a RBP III benthic macroinvertebrate survey at one station (CB01A) in this segment. Station CB01A was located downstream from Talbots Way, Seekonk, MA. There was little water in the stream channel, resulting in extremely shallow riffles that provided epifaunal habitat for macroinvertebrates that was marginal. In addition, the lack of stable cover due to substrate exposure and shallow pools resulted in virtually no productive fish habitat. In-stream deposition of fine sediments, both organic and inorganic, affected about a third of the stream bottom in the CB01A sampling reach (Appendix B).

Field observations recorded adverse conditions at the water quality Station CB01 located downstream from Route 152 in Seekonk, MA during the 2002 survey season. According to the field observations, the brook was partially dammed by a property owner directly upstream from the sampling location to create a pond on their property. This manipulation noticeably restricted flow downstream from the property during the survey season. Samples were not collected during July and August due to lack of water. By October the water level in the brook had increased.

Biology

Despite considerable in-stream habitat limitations related to low baseflow, the CB01A benthic community was highly comparable (90%) to both reference stations (TM01 and SM00). The MassDEP DWM 2002 RBP III analysis indicated that Station CB01A represented a "non-impacted" biological community (Appendix B).

Water Chemistry

MassDEP DWM conducted water quality monitoring at one station (CB01 – described above) in this segment during the 2002 monitoring season. Station CB01 was sampled during three surveys (May, June, and October) for total phosphorus, ammonia-nitrogen, and total suspended solids. All parameters met SWQS. *In-situ* measurements were taken at this Station for temperature, conductivity, total dissolved solids, dissolved oxygen, and percent dissolved oxygen saturation. Including both dawn and pre-dawn hours, six *in-situ* measurements were taken in this segment. There was one violation of the SWQS for percent dissolved oxygen saturation (this measurement was taken during the day (Appendix D).

The *Aquatic Life Use* for this segment is assessed as support based on the RBP III analysis and water quality data. The use is identified with an Alert Status, however, because of low flow/no flow conditions caused by lack of water from flow manipulation by a property owner.

Primary and Secondary Recreation Uses
MassDEP DWM collected bacteria (fecal coliform, *E. coli*, and *Enterococcus* sp.) from one station (CB01- described above) along this segment during three surveys (May, June, and October – 2002; Appendix D). A brief summary of the data is presented below.

Parameter	May	June	October
Station CB01			
Fecal coliform	350 cfu/100mL	300 cfu/100mL	100 cfu/100mL (n= 3)

The *Primary and Secondary Contact Recreation* uses are assessed as support for Coles Brook based on low fecal coliform counts.

Aesthetics Use
MassDEP DWM recorded field observations during the 2002 survey season at one station (CB01 - described above) along this segment during five surveys (May, June, July, August, and October) (Appendix D). Station observations are summarized below.

CB01
The water column was described as having no odors and clear, except for the July and August surveys when there was no water.

The *Aesthetics Use* is assessed as support for this segment based on 2002 field observations (lack of objectionable conditions, e.g. odors, oils, and/or deposits).

Coles Brook (MA52-11) Use Summary Table

Designated Uses		Status
Aquatic Life		SUPPORT*
Fish Consumption		NOT ASSESSED
Primary Contact		SUPPORT
Secondary Contact		
Aesthetics		

*Alert Status issues identified, see details in use assessment

RECOMMENDATIONS – COLES BROOK (MA52-11)
Continue to sample this segment during the next round of DWM monitoring in 2007 to document any changes to the water quality and the biological communities since the 2002 survey.

Confirm the source of low flow conditions in this segment (e.g., withdrawals, drought year, flow manipulation by land owners).

CENTRAL POND (SEGMENT MA52006)

Location: Seekonk/Pawtucket, RI/Providence, RI
Segment Area: 5.8 acres (Massachusetts portion)
Classification: Class B

This segment is on the proposed Massachusetts Year 2004 Integrated List of Waters – Category 5, "Waters requiring a TMDL" - pollutants needing TMDLs: noxious aquatic plants, nutrients (MassDEP 2005a).

DESIGNATED USE ASSESSMENT

Aquatic Life Use

Biology

In July 2002 MassDEP DWM conducted a survey of Central Pond. Field notes indicated that greater than 90% of the surface was covered with duckweed. Also, a very dense subsurface cover of *Elodea sp.* and a filamentous algae mat were observed (MassDEP 2002b).

Water Chemistry

In June, July, and August 2002 MassDEP DWM collected grab samples for total phosphorus, chloride, chlorophyll *a*, and apparent color from Central Pond for the purpose of TMDL development. An *in-situ* profile (surface, mid-water, bottom) for dissolved oxygen, temperature, conductivity, and pH was conducted during the July survey. Water quality data collected from Central Pond can be found in Appendix E. Elevated total phosphorus (>0.05 mg/l) and chlorophyll *a* concentrations (>10 mg/m^3) and low dissolved oxygen/saturation and supersaturation were documented (Appendix E).

The *Aquatic Life Use* for this segment is assessed as impaired based on elevated total phosphorus concentrations, which are contributing to high productivity (algal and macrophyte growth in the impounded reaches of this segment), and low dissolved oxygen and supersaturation conditions.

Primary and Secondary Contact Recreation and Aesthetics Uses

The *Recreational and Aesthetics uses are* impaired because of the dense macrophyte cover and excess algal growth observed during the July 2002 survey.

Central Pond (MA52006) Use Summary Table

Designated Uses		Status
Aquatic Life		IMPAIRED Cause: Elevated total phosphorus, organic enrichment, nutrient enrichment, low dissolved oxygen, dissolved oxygen saturation, aquatic plants/macrophytes, excessive algal growth Source: Municipal point source discharges (Suspected sources: Discharges from municipal separate storm sewer systems (MS4), municipal (urbanized high density area))
Fish Consumption		NOT ASSESSED
Primary Contact		IMPAIRED Cause: Excess algal growth, aquatic plants/macrophytes, elevated total phosphorus Source: Municipal point source discharges (Suspected sources: Discharges from municipal separate storm sewer systems (MS4), municipal (urbanized high density area))
Secondary Contact		
Aesthetics		

RECOMMENDATIONS – CENTRAL POND (MA52006)

Continue to sample this segment during the next round of DWM monitoring in 2007 to document any changes to the water quality and the biological communities since the 2002 survey.

JAMES V. TURNER RESERVOIR (SEGMENT MA52022)

Location: Seekonk/East Providence, RI
Segment Area: 28.4 acres (Massachusetts portion)
Classification: Class B

This segment is on the proposed Massachusetts Year 2004 Integrated List of Waters – Category 5, "Waters requiring a TMDL" - pollutants needing TMDLs: nutrients, noxious aquatic plants (MassDEP 2005a).

DESIGNATED USE ASSESSMENT

Aquatic Life Use

Biology

In July 2002 MassDEP DWM conducted a synoptic survey of James V. Turner Reservoir. Field notes from the survey indicated moderate to dense macrophyte cover. Additionally, field notes from the August 2002 survey indicated that a very dense filamentous green algal mat was observed on the bottom of the reservoir – the northern portion of the reservoir was 50% covered with this mat and the southern portion had a sparser coverage of the algae on the bottom. Duckweed was observed to be dense in the cove areas of the reservoir and sparse elsewhere (MassDEP 2002b).

Water Chemistry

In June, July, and August 2002 MassDEP DWM collected grab samples for total phosphorus, chloride, chlorophyll *a*, and apparent color from James V. Turner Reservoir for the purpose of TMDL development. An *in-situ* profile (surface, mid-water, bottom) for dissolved oxygen, temperature, conductivity, and pH was conducted during the July survey. Water quality data collected from this segment can be found in Appendix E. Elevated total phosphorus (>0.05 mg/l) and low dissolved oxygen/saturation and supersaturation were documented (Appendix E).

The *Aquatic Life Use* for this segment is assessed as impaired based on elevated total phosphorus concentrations, which are contributing to high productivity (algal and macrophyte growth in the impounded reaches of this segment), and low dissolved oxygen and supersaturation conditions.

Primary and Secondary Contact Recreation and Aesthetics Uses

Of the three Secchi disk depth measurements taken during the 2002 survey season, there was one violation (1.1 m measured from the August survey). Additionally, field notes recorded from the August survey described a prevalent phytoplankton bloom in the water column (MassDEP 2002b).

The *Recreational* and *Aesthetics uses* are impaired based on the phytoplankton bloom observed during the August 2002 survey.

James V. Turner Reservoir (MA52022) Use Summary Table

Designated Uses		Status
Aquatic Life		IMPAIRED Cause: Elevated total phosphorus, organic enrichment, nutrient enrichment, low dissolved oxygen, dissolved oxygen saturation, aquatic plants/macrophytes, excessive algal growth Source: Municipal point source discharges (Suspected sources: Discharges from municipal separate storm sewer systems (MS4), municipal (urbanized high density area))
Fish Consumption		NOT ASSESSED
Primary Contact		IMPAIRED Cause: Excess algal growth, aquatic plants/macrophytes, elevated total phosphorus Source: Municipal point source discharges (Suspected sources: Discharges from municipal separate storm sewer systems (MS4), municipal (urbanized high density area))
Secondary Contact		
Aesthetics		

RECOMMENDATIONS – JAMES V. TURNER RESERVOIR (MA52022)

Continue to sample this segment during the next round of DWM monitoring in 2007 to document any changes to the water quality and the biological communities since the 2002 survey.