VI. MANAGEMENT OF WATER QUALITY, QUANTITY AND INSTREAM FLOW

Stream gage on Nemasket River, Middleborough RIFLS Program

Water quality and quantity are integral to maintaining the outstanding values of the Taunton Wild & Scenic River. Without good water quality and sufficient stream flow, many of our restoration goals for fisheries, wildlife and habitats will be unattainable. For example, thermal pollution, low dissolved oxygen and low flow are some of the current threats to fisheries restoration. There are many signs of improvement as well, including the return of harbor seals, bald eagles and osprey, predators that signal the renewed health of our waterways.

The overall health of the Taunton River has greatly improved in the past thirty years. Once considered toxic as a result of its use and abuse as an industrial and commercial river, water quality in the Taunton River has improved with the passage of strict environmental regulations and the disappearance from its banks of many of the sources of pollution. The legacy of these past polluters lies buried in the sediments from the upper stretches of the river all the way down to Mount Hope Bay. The tangible, physical signs of improvement, such as the presence of predators and healthier macroinvertebrate communities, all point towards steady recovery of the river. These signs of improvement should not, however, be taken as an excuse to become complacent in regards to the water quality, quantity or need for stewardship in the Taunton River corridor.

High levels of nutrients and pathogens, excessive plant growth and low dissolved oxygen have placed several sections of the Taunton River and its tributaries on the state list of impaired waters under section 303(d) of the Clean Water Act. The Taunton River is designated as a Class B warm water fishery by the Commonwealth of Massachusetts, which means that it should meet the state's dissolved oxygen, temperature, pH, and pathogen criteria for primary and secondary contact recreation (this is often called a "fishable and swimmable"

standard). In reality, portions of the river and many of its tributaries often do not meet their designated uses, especially after storm events.

Objectives

1. **Increase Public Awareness** of the critical importance of adequate stream flow and water quality to the continued enjoyment of the Taunton River as an outstanding resource of regional, state and national significance.
2. **Ensure Sufficient Water Quality and Stream Flow** to protect and enhance the long-term viability of the outstanding resources of the Taunton River and Narragansett Bay.
3. **Support Local Planning** in the ten corridor communities to avoid point and non-point pollution problems and retain natural stream flow.

The majority of the nutrient and pathogen load to the Taunton River comes from sewage treatment plant discharges, which degrade water quality and cause closure of shellfish beds in the lower river. Currently, the largest sewage treatment plant is the Brockton Waste Water Treatment Plant, which discharges an average of 21 million gallons per day of treated wastewater to the Salisbury Plain River, a tributary to the Matfield River. This discharge constitutes 8,400% of the ten year low flow in the Salisbury Plain River and 15% of the average annual flow downstream in the Taunton River. Brockton's wastewater discharge is thus a large part of the reason that both the Salisbury Plain and Matfield Rivers are on the 303(d) list for pathogens.

Although Massachusetts has no water quality criteria for sediments, nutrients, or stream flow, all of these parameters play vital roles in the health of the river. Non-point source runoff is a major source of sediment, nutrients and pathogens, especially from the urbanized areas of Brockton, Taunton and Fall River. Tributary systems such as the Winnetuxet River, Nemasket River and Forge River are also threatened by non-point source pollution from increased runoff. Stormwater runoff from impervious surfaces in these subwatersheds also contributes to high flows during storm events and reduces groundwater recharge. Because groundwater sustains stream flow between storm events, reductions in groundwater recharge can cause declines in stream flow, particularly during late summer when flows are naturally lowest and most vulnerable to depletion. Species that have evolved with reliance on natural stream flows may not be able to feed, reproduce, or even survive some unnaturally low flows.

Threats to Water Quality, Quantity and Instream Flow

- Additional demand on water supply caused by increasing development and human population could cause flow alteration in the Taunton River as well as the tributary systems, altering habitat.
- There is a lack of funding for stormwater improvements and maintenance of existing systems.
- Several communities have reduced their municipal staff such as planners and conservation agents, leaving them with outdated or inadequate zoning.
- Extension of sewers, while protecting against water quality degradation may invite added development to sensitive areas.
- New percolation rates or other changes to Title 5 septic system rules could open up new previously undevelopable land to development.
- Discharges from municipal wastewater treatment plants create water quality problems in the Taunton River.
- Salting and sanding of roads is adding additional pollutants and sedimentation to the river.
- The BFI landfill in Fall River is unlined in parts and is leaching contaminants to Mothers Brook, a tributary to the Taunton River.
- Contaminated sediments remain in many parts of the river, particularly in the estuary.
- Thermal pollution from heated power plant discharges has degraded water quality in the estuary.

Monthly water quality monitoring conducted by the Taunton River Watershed Alliance (TRWA) since 1991 has shown that both nitrogen and phosphorus levels in the Taunton River and its tributaries have been quite high during the summer months. A large percentage of this pollution has been shown to come from the Matfield River. Water quality monitoring conducted by the Bridgewater State College Watershed Access Lab during the summer of 2004 confirms that the Town, Matfield and Nemasket Rivers all had excessive nutrient loading due to wastewater treatment plant discharges.

In the Taunton River system, phosphorus is the limiting nutrient for plant growth in fresh water, while nitrogen is the limiting factor in the estuary. Excessive plant growth caused by elevated nutrient levels lowers the dissolved oxygen content due to plant decay and respiration and limits the aquatic life that can survive in the river.

Monitoring by the watershed access lab has also detected several occurrences of low dissolved oxygen (DO) levels where DO dropped below the Massachusetts Class B warm water fishery minimum of 5.0 mg/L. Most of these low DO events occurred on four different tributaries of the upper river during low flows (TRWA monitoring report, 1999-2000). Repeated or prolonged periods of depressed DO concentrations can stress aquatic life and may lead to changes in biological

community structure as species intolerant of pollution and stress migrate away or die.

Other river reaches on the state's impaired list include the following, although many reaches have not yet been assessed:

-The Taunton River from the Route 24 bridge in Taunton to the Berkley Bridge (pathogens);
-The Taunton River below the Berkley Bridge to mouth of the river (pathogens and organic enrichment/low dissolved oxygen)
-The Assonet River from the Route 24 Bridge in Freetown to confluence with the Taunton River (pathogens).

Rivers with unnatural stream flow regimes are not necessarily listed on the state's list of impaired waters, unless low stream flows result in elevated temperatures, lowered dissolved oxygen levels, or a concentration of pathogens. The state's Water Resources Commission maintains a separate list of "High Stress Basins", which includes the Segreganset River in Dighton (a United States Geological Survey stream gauge has provided data for this location); high stress basins have unusually low stream flow per square mile of watershed compared to other rivers in the state. Unfortunately, many rivers remain unassessed due to a lack of data.

The Massachusetts Riverways Program maintains a list of observations of low stream flow episodes called the Low Flow Inventory (including several tributaries and headwaters of the Taunton River. In some cases, low flows are caused by water supply withdrawals for communities outside the watershed. For instance, Stump Brook in Halifax suffers from altered stream flows because water is withdrawn from its source, Monponsett Pond, and transferred to Silver Lake in Kingston, which serves as the water supply for the City of Brockton. In other cases, the water is used within the watershed, but the point of withdrawal is directly connected to the river. This is the case on the Canoe River, where severely reduced stream flow resulted in extremely warm water and freshwater mussel kills near the Norton Town well downstream of the Newlands Street Bridge in 1999. One hundred yards downstream, the water began to flow again, indicating that the problem was limited to the area near the well. Observers noted dead mussels and many mussel tracks indicating that the mussels were stressed by the low flow and high temperature conditions, although the stream appeared to have good habitat. This area has in the past harbored several rare freshwater mussel species including triangle floater (*Alasmidonta undulata*), Eastern pondmussel (*Ligumia nasuta*), and the Federally endangered dwarf wedgemussel (*Alasmidonta heterodon*).

Other stream flow problems have not yet been investigated and may be caused by a combination of water withdrawals, lack of groundwater recharge due to land development, and/or the transfer of water or wastewater out of the watershed:
- Fall Brook, Taunton – dry in 2002;
- Muddy Cove Brook, Taunton – dry in 2002;
- Sally Richmond Brook in Dighton - dry in 2002;
- Nemasket River headwaters in Middleborough - dry in 1997.

Additionally, a study by the United States Geological Survey (Ries 1999) suggested that the following streams be investigated for potential stream flow alterations because their flow regimes did not correlate well with other nearby streams:
- Trout Brook at Brockton;
- Poor Meadow Brook at South Hanson;
- Robbins Pond outlet near East Bridgewater;
- Queset Brook at North Easton.

Action Strategies

Increase Public Awareness

- Use municipal hazardous waste collection days to educate residents about the importance of proper disposal (Raynham Open Space Plan).
- Educate residents about the impact to water quality from the use of pesticides and fertilizers through partnerships with municipalities and watershed groups.
- Educate the public about routine septic system maintenance and/or require proof of maintenance records through partnerships with municipalities and watershed groups (Taunton Master Plan).
- Increase awareness about the importance of stream side buffers, ecological landscaping and water conservation.
- Promote public involvement and comment in permitting processes throughout the watershed.
- Support Stream Teams in their education and outreach efforts and in implementing projects from their action plans.

Ensure Sufficient Water Quality and Stream Flow

- Retain the natural flow regime as much as possible by protecting seasonal fluctuations in flow in the Taunton River, its tributaries and headwater streams.
- Use Water Management Act permits and other opportunities to restore stream flow to areas that have low flow problems.
- Support nitrogen and phosphorus limits in the water quality standards for Massachusetts.
- Encourage fixing inflow and infiltration before looking for additional water supplies.
- Any construction activities along the river should comply with 401 water quality standards and should maintain consistency with Massachusetts Coastal Zone Management policies.
- Ensure that all major NPDES permits are current and in compliance and that all minor permits are updated.

Support Local Planning : Promote a comprehensive, watershed based approach to management of growth, water supply, and wastewater treatment/disposal

- Promote municipal adoption of stormwater and erosion control regulations that include requirements for lot coverage, minimum percent open space and maximum percent impervious surface and strengthen site plan review to ensure that all water protection regulations are met (Raynham Open Space Plan).
- Limit impervious surfaces wherever possible through the use of natural drainage, reduction of building footprints and parking lot area, use of grass swales and parking lot islands, use of porous pavement and protection of pre-development vegetation (Raynham Open Space Plan).
- Promote bylaws that incorporate low impact development and require new development and redevelopment to limit stormwater flow to current or predevelopment levels.
- Require an impact evaluation for any extension of new infrastructure to address the impacts to potential development. Define growth boundaries through limitations on infrastructure development including water and sewer connection moratoria (Middleborough Master Plan, 2001).

- Consider adoption of a Resource Protection Overlay Zone which would include wetlands and other related overlapping resources such as river frontage, ponds frontage, habitat areas, vernal pools and ACECs. Development near or within these areas would be subject to site plan review (Raynham Open Space Plan).
- Explore alternatives to sodium chloride for road salting, use salt more judiciously or designate no salting areas near sensitive waterways.
- Encourage passage of bylaws that strengthen Title 5 septic regulations (Halifax and Dighton have retained their percolation rates at 30 minutes per inch).