

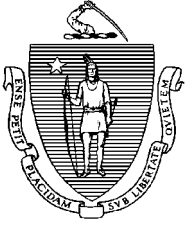


Boston Harbor Watersheds 2004 - 2009 Action Plan

November, 2004

Prepared for:
Massachusetts Executive Office of Environmental Affairs

Prepared by:
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November 22, 2004

Dear Friends of the Boston Harbor Watersheds:

It is with great pleasure that I present you with the 5-Year Watershed Action Plan for the Boston Harbor Watersheds. The plan will be used to guide local and state environmental efforts within the Boston Harbor Watersheds over the next five years. The plan expresses some of the overall goals of the Executive Office of Environmental Affairs, such as improving water quality, restoring natural flows to rivers, protecting and restoring biodiversity and habitats, improving public access and balanced resource use, improving local capacity, and promoting a shared responsibility for watershed protection and management.

The Boston Harbor Watershed Action Plan was developed with input from the former Boston Harbor Watershed Team and multiple stakeholders including watershed groups, state and federal agencies, municipal officials, Regional Planning Agencies and, of course, the general public from across the Watershed. We appreciate the opportunity to engage such a wide group of expertise and experience as it allows the state to focus on the issues and challenges that might otherwise not be easily characterized. From your input we have identified the following priorities that apply to all the subwatersheds:

- Sewer System Maintenance, Improvements, and Extensions
- Stormwater Management and Groundwater Recharge
- Septic Management
- Management of Landscaped Areas
- Water Supply and Streamflows
- Riverine Habitat
- Public Access to Waterways
- Watershed Assessment
- Boating Initiatives

I commend everyone involved in this endeavor. Thank you for your dedication and expertise. If you are not currently a participant, I strongly encourage you to become active in the Boston Harbor Watersheds' restoration and protection efforts.

Regards,

A handwritten signature in cursive script that reads "Ellen Roy Herzfelder".

Ellen Roy Herzfelder

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Introduction

The 2004 Boston Harbor South Watersheds Action Plan was produced under a contract between the Massachusetts Executive Office of Environmental Affairs and the Neponset River Watershed Association (NepRWA). NepRWA collaborated in its work with the Urban Harbors Institute of the University of Massachusetts Boston, the Boston Harbor Association, the Fore River Watershed Association, the Weir River Watershed Association and the Back River Watershed Association.

In addition, a volunteer Advisory Committee provided invaluable assistance in the design, development and review of the action plan. Advisory Committee members included David Colton, Director of the Milton Department of Public Works; Wes Dripps of the University of Massachusetts, Boston; Margo Clerkin, Conservation Agent of Hull; and Nan Crossland, Executive Director of the Dedham-Westwood Water District. Finally, there was considerable public participation in the preparation of this report, including interviews with at least three stakeholders in each of the four watersheds and Boston, as well as through a series of open public meetings.

This report spells out a comprehensive set of responses needed to remedy problems identified in its companion document the “Boston Harbor South Watersheds Assessment Report.” It covers the four individual watersheds that discharge into Boston Harbor from south of the City of Boston — the Neponset, Weir, Fore and Back River Watersheds — plus those portions of the City of Boston which border the Harbor itself south of the Charles River, hereinafter referred to as “Boston Inner Harbor Watershed”.

This document does not cover the two major watersheds contributing to the Harbor from the north of Boston — the Charles and Mystic

River Watersheds. Therefore, it is not the purpose of this action plan to recommend steps needed to restore receiving water quality in the Boston Harbor itself, but rather to recommend actions needed to restore the environmental health of the individual watersheds from their headwaters to the points at which they discharge into the Harbor.

Since MWRA began pumping sewage from Deer Island to its outfall pipe in Massachusetts Bay, most of the pollution in the Harbor itself comes from the contributions of the various rivers discharging into the Harbor along with Combined Sewage Overflows (CSOs) from the City of Boston. MWRA data indicate that it is the Charles and Mystic Rivers, and not the rivers covered in this report, which are the largest contributors to the Harbor’s pollution. In any case, the measures recommended here, while not specifically designed to restore the Boston Harbor, would undoubtedly benefit the Harbor significantly if implemented.

The recommendations presented here are based not only on the experience of the authors, but also on the advice and comment of state agency staff, municipal officials and considerable public input.

In each watershed, the recommendations are intended to protect or restore the following broad natural resource values:

- Water Quality;
- Watershed Hydrology and Water Supply;
- Physical Habitat; and
- Open Space and Outdoor Recreation

While the Boston Inner Harbor, Neponset, Fore Back and Weir Watersheds, are each unique, they also have many watershed

management issues in common. In the interest of simplicity, those actions that apply generally to all the watersheds have been consolidated here into a “Common Action Plan.” The action plan is organized around a basic set of “issues” affecting the study area. Specific action recommendations are provided for each issue area. Please note however that the “issues” are not listed in order of priority.

“Priority Action Items” for each individual watershed are detailed in the individual watershed chapters. Some of the actions in these individual chapters are unique to that watershed. Others are taken from the Common Action Plan but are of particularly high priority for the watershed in question. The individual watershed chapters also include information on specific sites where a problem needs to be addressed within each of the watershed.

Common Action Plan for all Boston Harbor South Watersheds

Sewer System Maintenance and Improvements: General

Recommended Action for state government:

- Project selection criteria under the Wastewater State Revolving Fund (SRF) should be strengthened to ensure that priority is given to unmet operation and maintenance needs. The authors recognize and appreciate that the SRF is already moving in this direction.

Sewer Systems: Illicit Connections to Storm Drains

Illegal connections are a major problem for water quality, and their detection and elimination are essential for proper stormwater management (see “Stormwater Management,” below). Detection and elimination are required activities under Phase II of the federal stormwater management program.

Recommended Actions for Government

- Cities and towns must fulfill their responsibilities under Phase II Stormwater rules regarding illegal connections (including public outreach). Each community should establish a timetable for detection and remediation. The state and federal governments need to hold municipalities accountable for fulfilling their Stormwater Phase II requirements.

Recommended Actions for Citizen Groups

- Citizen groups should help towns identify illegal connections. This requires significant shoreline survey work. Citizen water quality monitoring, during both wet and dry weather, also provides an important source of ongoing reconnaissance to identify potential problems.

Sewer Systems: Inflow and Infiltration (I/I)

Inflow consists primarily of private individuals illegally diverting stormwater from their property into public sewers. Inflow creates very high flows over short periods, thus contributing to Sanitary Sewer Overflows (SSO's) and greatly increasing the marginal cost of wastewater treatment (since treatment capacity is designed for times of maximum flow). In addition, ground water draining into broken sewer pipes as infiltration plays a major role in preventing adequate groundwater recharge and reducing instream flows.

Recommended Actions for MWRA

- MWRA should expand the Grant/Loan Program for both infiltration and inflow (I/I) remediation for communities using MWRA sewers. While this has short-term costs to ratepayers, in the long term it will save money by reducing the amount of water that has to be treated at Deer Island as well as by increasing the amount of clean groundwater available for public use.
- MWRA should require towns to “use or lose” funds from the

program within three to five years, so as not to tie up funds which other communities could use.

- MWRA should also help educate the public on the role played by I/I (as well as illicit connections, discussed above) in creating sanitary sewer overflows during storms and in reducing seasonal river flows, as well as on the long-term cost savings from reducing I/I.

Recommended Actions for State Government

- DEP should complete and publish Sewer System Operation & Maintenance Guidelines. DEP should also require at least four to one remediation of I/I for new development and redevelopment, particularly in stressed basins or wherever surcharging has occurred.
- Develop and disseminate model bylaws/program guidance for establishing municipal 4:1 I/I remediation programs for those municipal hookups that don't require a DEP sewer extension permit.
- DEP should research and report on how towns are progressing on I/I identification and remediation.
- The state should also fund a study of mandatory inspection and remediation of I/I problems on private property at time of sale.

Recommended Actions for Municipalities

- The MWRA Infiltration & Inflow Task Force has identified many Best Management Practices that should be adopted by towns to identify, prioritize and remediate I/I. These recommendations should be implemented by municipalities (even in towns not using MWRA sewers).
- Municipalities should also increase public education about I/I, especially on the relationship of I/I to SSOs, and on how I/I reduction ultimately lowers water and sewer bills.
- Municipalities should adopt bylaws for new development and significant redevelopment requiring developers to remediate current I/I problems at a four to one ratio at a minimum for each

additional gallon of water they will add to the sewer system (so-called "Wastewater Banking").

- Municipalities should also inspect new sewer extensions and connections for leakage before granting occupancy and/or other permits.

Recommended Actions for Citizen Groups

- Citizen groups should help provide citizen education on I/I. They should also research and publicize reports on how municipalities are doing in remediating I/I.
- Regarding the proposals discussed above regarding I/I rules for new developments and for sales of homes, citizen groups can assist by studying the issues involved and developing model rules for implementing them.

Sewer Systems: Exfiltration

Exfiltration is another cause of the discharge of raw sewage into waterways. Sewage from leaking sewer pipes can reach surface waters directly or be carried there by storm sewers.

Recommended Actions for state government

- DEP should complete and publish Sewer System Operation & Maintenance Guidelines.
- The state should re-establish the Volunteer Water Quality Monitoring Grants Program to provide support for citizen action on this problem.

Recommended Actions for Municipalities

- Municipalities should identify possible exfiltration through checking storm drains and other surface water discharge locations during dry weather (as they are required to do to identify illegal connections under federal Phase II Stormwater rules - see "Sewer Systes: Illicit Connections," above).
- The same measures that municipalities should take to remediate

infiltration of sewers (see above) will also generally prevent exfiltration and should be implemented by municipalities.

Recommended Actions for Citizen Groups

- Citizen groups should assist by conducting shoreline surveys and water quality monitoring.

Sewer Systems: Sewer Extensions and Capacity Expansion

Sewer extensions for new development can create or exacerbate low flow problems where wastewater is being discharged outside the watershed (e.g., to Boston Harbor). They can also create SSO problems by increasing the flows directed to existing lines downstream. Where existing homes are on septic systems and those systems fail, there is often pressure to connect to, or even extend, nearby sewer mains. Finally groundwater levels may be further depleted if sewer authorities increase the capacity of sewer pipes to carry excess flows that are caused by a failure to address the root causes of infiltration and inflow.

Recommended Actions for MWRA, State and Municipal Officials

- The state, along with local and regional sewer authorities, should deny sewer extensions that will exacerbate SSOs, surcharging or low streamflows without first dealing with their core causes. Infiltration and inflow, as well as illegal connections, should be remediated before sewer extensions or expansion of sewer collection system capacity is considered, especially where MWRA or state financing is involved.
- Wherever a community is experiencing SSOs or surcharges, as well as in stressed basins, new development should be required to mitigate any new proposed flow to the sewer system by remediating I/I at a four to one ratio, measured by annual daily average (and not peak) flow.
- DEP should consider sewer extensions and expansions as a substitute for decentralized wastewater treatment systems only as a last resort. Because onsite sewage systems (such

as package treatment plants, community onsite systems, and individual septic systems) do much more to recharge local groundwater supplies than do sewer systems (especially where most sewerage leaves the watershed entirely and is discharged directly into Boston Harbor at Deer Island), on-site systems should be the preferred method of wastewater treatment for family homes where lot sizes permit. See “Septic Management,” below, on how costs of septic systems can compare favorably to sewer hookups.

Stormwater Management and Groundwater Recharge

Inadequate stormwater treatment is a major cause of water pollution in Boston Harbor and its tributaries. Uncontrolled runoff, especially from streets, parking lots, roofs, and other “impervious” surfaces, also diverts water that would naturally recharge (replenish) groundwater supplies. Groundwater is essential to adequate water supplies as well as surface water streamflow levels (see Section 5, below). In addition, uncontrolled runoff can cause flooding.

Stormwater treatment is regulated under DEP’s Stormwater Management Guidelines for projects subject to the Wetlands Protection Act and Water Quality Certification rules. Implementation of the Guidelines by conservation commissions is somewhat uneven, particularly in regard to groundwater recharge criteria. Furthermore, the Guidelines may not be adequate to restore water quality because of their overemphasis on total suspended solids and lack of attention to other pollutants such as bacteria, nutrients and metals. Stormwater management outside wetland resource areas is covered by a patchwork of zoning and other rules, which vary greatly in stringency from town to town.

Recommended Actions for state and federal government

- DEP should conduct a regional study to identify specific sites that are most in need of/conducive to stormwater retrofits;
- DEP should develop an improved stormwater guidance (especially on how to handle bacteria, metals and nutrients);
- DEP and EPA should mandate municipal stormwater bylaws

with requirements as stringent as those outlined in DEP's Stormwater Management Guidelines; these bylaws should apply to all stormwater, not just that being discharged to wetlands or waterways (such bylaws are currently being developed in the North and South River Watersheds and could serve as a model);

- Financial assistance should be given by state and federal authorities for municipal implementation of federal Stormwater II mandates, including public outreach;
- NPDES Stormwater Phase II regulations should be strictly enforced;
- DEP and EPA should increase staffing for technical assistance to municipalities (including municipal boards), especially regarding the relationship of new development to groundwater recharge and water supply; and
- DEP and EPA should provide additional funding for demonstration (pilot) projects on stormwater treatment.

Recommended Actions for municipal government

- Implement all NPDES Stormwater Phase II requirements, including those pertaining to SSOs, illegal connections, public participation and education, mapping and management of municipal facilities;
- Adopt zoning bylaws allowing, encouraging, or requiring "low impact development" (LID) for new construction and major reconstruction projects. Some LID techniques are:
 - use of stormwater retention swales rather than curbs in subdivisions,
 - using Best Management Practices (BMPs) to mimic predevelopment hydrographs,
 - reduction of required road widths in subdivisions,
 - "decentralizing" subdivision stormwater management so that stormwater retention and groundwater recharge occur on individual lots to the maximum feasible extent,

- "disconnecting" impervious surfaces; i.e., directing roof and driveway runoff to lawns or swales and not to driveways, streets and stormdrains,
- use of bioretention cells that emphasize plant uptake of pollutants, refiltration, and sediment removal,
- use of numerous swales, buffer strips, and other BMP's that incorporate biological treatment functionality in addition to simple settling;

- Require mitigation of current off-site stormwater problems at a two or three to one ratio for every cubic yard of runoff proposed for discharge to surface waters;
- Establish dedicated fee-based revenue sources to support stormwater work;
- Adopt bylaws requiring stormwater management in areas outside wetlands as stringent as those required under DEP's Stormwater Guidelines;
- Retrofit locations with poor stormwater management systems;
- Increase efforts to educate the public on the need to properly manage stormwater in partnership with private and nonprofit groups; and
- Adopt and enforce bylaws requiring owners to clean up after their pets, and posting of "mutt mitts" in public parks.
- See also "Collaborative Strategies," below

Recommended Actions for Citizens and Regional Alliances

- Collaborative efforts on creation of public education materials that can be "localized" by or for municipalities to meet their needs;
- Conducting demonstration (pilot) projects regarding optimal stormwater treatment methods;
- Drafting of model bylaws;
- Helping identify and prioritize stormwater retrofit projects;

- Maximizing use of available grant funds;
- Preparing an analysis of the application of stormwater utilities to reduce stormwater management costs; and
- Public outreach on stormwater prevention and on maintenance and repair of stormwater management systems.

Septic Management

Properly operating septic systems do a good job of protecting ground and surface waters from harmful pollution. They also recharge groundwater at a local level, as opposed to sewer systems that take water from the subwatersheds and discharge it directly (via MWRA and other sewers) into Boston Harbor or Massachusetts Bay. For these reasons, properly designed and maintained septic systems or other decentralized approaches to wastewater treatment are the environmentally preferable method of sewage disposal. Regular pumping of septic systems costs less than half as much as MWRA sewer rates and decreases municipal water supply costs by helping to recharge groundwater. [Note that there are essentially no septic systems in the Boston Inner Harbor Watershed.]

Recommended Actions for State Government

- DEP should mandate regular tank pumpouts by septic owners;
- The state should increase aid to municipalities and citizen groups for the septic-related activities described directly below.

Recommended Actions for municipalities and citizen groups

- Increase citizen awareness of the need to regularly pump out septic tanks;
- Develop a model database to be used by municipalities that links Board of Health data bases on individual pump-outs to “reminder letters” when another pump-out is due;
- Create by-laws requiring pump-outs of septic tanks every two years;
- Enforce more rigorously current septic hauler Title 5 annual

licensing requirements to ensure they accurately report to the Board of Health the condition of each septic system they pump;

- Increase local enforcement against owners of septic systems which are known to the Board of Health to be in need of repair or replacement;
- Establish a small fee on the water bills of septic users to cover the costs of basic education and enforcement activities; and
- Create municipal “septic utilities” (or at least a pilot project) to:
 - maximize regular pumping of all septic systems,
 - decrease septic pumping costs,
 - “insure” septic owners for the costs of major repairs and replacement,
 - increase municipal government awareness of septic system failures, and/or
 - establish a dedicated revenue source (grants or loans) for septic repair and replacement.

See also “Sewer System Extensions,” above

Management of Landscaped Areas

Stormwater runoff from lawns, etc. is a primary source of excessive nutrients from fertilizers, suspended solids, bacteria from animal wastes, and sedimentation. The issue is particularly serious for waterfront property owners, whose runoff goes directly into surface waters and whose land use practices (e.g., lack of a naturally vegetated buffer strip of land along the shore) can be dramatically harmful to wildlife habitat both along as well as within streams and ponds. It is also an issue for other public and private landowners whose polluted runoff ends up in surface waters via stormdrains, road drainage ditches, etc.

Recommended Actions for Federal, State and Municipal

Government

- Educate the public and take other actions (described below) to stop excessive and wasteful use of fertilizers, pesticides and irrigation water on lawns, golf courses, and gardens;
- Use government owned properties as demonstration sites for responsible landscape management practices;
- Authorize the Massachusetts Soil Conservation Service to identify maximum permissible levels of fertilization for each municipality;
- Better educate state licensed pesticide professionals, with greater enforcement when warranted;
- Educate waterfront property owners and take other actions (described below) to preserve or restore naturally vegetated buffer strips along waterways. Such buffers can consist of attractive, native ornamental plants that reduce runoff and bank erosion while protecting wildlife habitat and providing shade to reduce water temperatures;
- Use wetland and waterways regulations and local wetland bylaws to maximize retention of naturally vegetated buffer strips along waterways;
- Amend state wetland regulations or local bylaws to ban impervious surfaces, lawns, trails, or anything else that destroys a natural vegetated buffer directly adjacent to rivers, streams, ponds and vegetated wetlands;
- Abide by sound land management practices for public lands, including restoration of naturally vegetated buffers strips along banks;
- Promote environmentally sound alternatives to large lawns;
- Provide state and federal grant funds for restorative work and for ongoing public education programs on landscape management and restoration;
- Create local bylaws forbidding subdivision covenants that require ecologically unsound turf lawn maintenance practices; and

- Create municipal zoning bylaws or other incentives which will limit environmentally damaging practices for new development; e.g.:
 - limiting tree cutting and/or lawn sizes,
 - forbidding construction site preparation prior to zoning board approval,
 - limiting removal of topsoil from properties under development.

Recommended Actions for Citizen Groups

- Identify bufferless riverfront areas for restoration and collaborate with government and landowners to protect and restore naturally vegetated areas;
- Educate homeowners (especially waterfront homeowners), golf courses, and lawn care companies on proper lawn and garden practices and organize lawn care courses for new homeowners; and
- Give awards, certifications, or other recognition to lawn care businesses, golf courses, etc. that practice ecologically sound management of manicured landscapes.

See also “Stormwater Management and Groundwater Recharge,” above.

Water Supply and Streamflows

The negative impacts of reduced instream flow include curtailment of recreational activities, increased concentration of bacterial and nutrient pollutants, increased risk of human exposure to contaminated river-bottom sediments, and a substantial reduction in the area and quality of aquatic habitats with resulting depletion of fish and other aquatic life. Causes of low instream flow include excessive use of water drawn from the watersheds, especially in summer months; interbasin transfer, especially via the MWRA sewer system; manipulation of water levels in impoundments; lack of adequate groundwater recharge due to impervious surfaces, and, most importantly, poor stormwater

management and sewer infiltration and inflow.

The Massachusetts DEP recently issued new Water Management Act Guidance with mandatory water conservation measures for communities in watersheds or subwatersheds designated as “stressed” by EOE. Unfortunately, most of the watersheds covered in this report are “unassessed” and stress levels assigned by EOE to those portions that are assessed are not based on all available relevant data.

Recommended Actions for Federal Government

- USGS should develop a ground and surface water model for each watershed to aid in predicting impacts and evaluating remediation of water withdrawals and other major water-related activities requiring a federal, state, or local permit; and
- USGS should operate more stream gauges in the Fore, Weir and Back River watersheds.

Recommended Actions for State Government

- Provide funding for more stream gauges in the Fore, Weir, and Back River Watersheds;
- Use other currently available environmental indicators to establish “stress” classification in unassessed areas;
- Set stricter water conservation standards for municipalities in low stressed and unassessed basins;
- Annually audit water supply statistical reports and impose penalties for inaccuracies;
- Ensure that all relevant permitting decisions (insofar as permissible by statute) contribute to restoration of the natural watershed hydrology;
- Consider the cumulative effects on the basin of each new well proposal, including existing but unutilized withdrawal authorizations;
- Issue habitat-based, site-specific and seasonally adjusted stream flow thresholds (to replace Aquatic Base Flow targets);

- Provide technical assistance to public water suppliers regarding water supply conservation, mitigation techniques and watershed hydrology;
- Coordinate mutual municipal assistance in water emergencies to avoid excessive capital investments in redundant infrastructure for individual towns, and
- Convene a dialogue with dam owners regarding the coordination of water release practices to ensure minimum daily summer flows, especially in times of drought.

Additional Recommended Actions for Municipalities

- Adopt and enforce Irrigation System Performance Standards (including night watering of lawns);
- Voluntarily comply with DEP’s water conservation requirements for highly stressed basins;
- Adopt bylaws allowing imposition of watering restrictions on private irrigation wells during periods of hydrological stress;
- Establish meaningful water conservation programs, and fund them through aggressively increasing block water rates; e.g., :
 - toilet replacement,
 - provision of rain barrels for roof runoff,
 - outreach and training on drought resistant plants,
 - elimination of discounts for second water meters;
- Conduct more frequent water billing so that consumers can immediately appreciate the cost of excessive summer water use; and
- Assess culverts to determine if they are barriers to fish passage and/or if they are appropriately sized for the stream.

Recommended Actions for Citizens and Regional Cooperatives

- Help educate the public, landowners, and municipal boards;

- Assist in coordination of municipal water sharing and dam water management practices; and
- Advocate for adequate water conservation funding at state and municipal levels.

Riverine Habitat

Riverine habitat has been greatly degraded in these watersheds due to pollution, low flows, contaminated sediments, invasive plant species, and destruction of natural vegetation along much of the shore that provides wildlife habitat and protects waterways from harmful sedimentation and runoff. Impoundments that no longer serve any useful purpose have eliminated or suppressed most anadromous fish runs in the watersheds. In addition to the recommendations below, the restoration of riverine habitats will require implementation of many of the other recommendations of this Action Plan. [Note that there are no surface streams in the Boston Inner Harbor Watershed.]

Recommended Actions for State Government

- Conduct ecological risk assessments of removing dams and/or creating fish passages;
- Prepare an inventory and ranking of potential riparian restoration sites, considering factors such as loss of buffer zone, channelization, bank armoring, channel erosion, daylighting and culverts set at wrong elevation or size;
- Assess areas of identified contaminated sediments in each watershed and develop Action Plans for dealing with them;
- Develop Open Space and Invasive Plant Inventories and Action Plans;
- Conduct regular fish and bug sampling to better assess aquatic ecological health;
- Designate appropriate stream segments as Cold Water Fisheries where such fisheries have in fact been identified in the field and fund continuous flow and temperature monitoring to support these designations;

- Allow offsite riverine habitat mitigation for new development/redevelopment along waterways; and
- Accelerate expenditure of existing Open Space Bond funds for habitat restoration projects.

Recommended Actions for Municipal Governments

- Restore vegetated riverine buffers and remove unnecessary channelization and riprap;
- Maximize use of available grant funds for restoration projects;
- Use wetland and waterways regulations and local wetland bylaws to minimize use of artificial bulkheads and riprap on banks and substitute bioengineered erosion techniques;
- Encourage removal of existing riprap or adding appropriate vegetation to it; and
- Require riverine habitat mitigation (offsite, if appropriate) for new development/redevelopment along waterways.

Recommended Actions for Citizen Groups

- Develop an educational plan and a volunteer network to help identify areas of invasive plant species;
- Conduct continuous flow and temperature monitoring to support recommended cold water fishery designations;
- Obtain state certification for identified “potential” vernal pool habitat, especially in protected wetland areas;
- Maximize use of grant funds for restoration projects; and
- Coordinate volunteers for pulling up water chestnuts and other nuisance aquatic vegetation and removing floating debris.

Public Access to Waterways.

Public access to navigable and potentially swimmable waters is limited in these Watersheds. Public access along the shore is also very limited.

Recommended Actions for State and Municipal Governments

- Expand public waterfront walkways and parks on public property, as well as on private property through Chapter 91 licensing and other incentives;
- Develop shoreline access plans at a parcel level of detail;
- Expand public amenities, handicapped access, and public programs in waterfront areas;
- Connect waterfront walkways to transit and other public lands;
- Prepare an inventory of potential boat launch and canoe launch sites and an action plan for their development;
- Expand the number of public boat ramps, canoe launching areas, water shuttles and other water-related activities; and
- Restore amenities and water quality at public beaches.

Recommended Actions for Citizen Groups:

- Identify locations for public boat launch areas;
- Advocate for public access under Chapter 91; and
- Advocate for waterfront open space acquisition.

Watershed Assessment

As of October 2002, the majority of streams, ponds and estuaries in these watersheds were wholly or partially “unassessed” by DEP, particularly in watersheds other than the Neponset. See DEP’s “Boston Harbor 1999 Water Quality Assessment Report”, October, 2002 for a full list of unassessed water bodies. Obtaining basic scientific data about the condition of our waterways is critical to the development of comprehensive action plans for the watersheds.

Recommended Actions for Federal, State and Municipal Governments

- Provide more federal and state funding to assess all designated uses of the water bodies in these watersheds, including aquatic

life, fish consumption, shellfishing, primary & secondary contact recreation, and aesthetic uses.

Recommended Actions for Citizens and All Levels of Government

- Organize ongoing, volunteer-based, monitoring programs throughout the study area that operate under the auspices of DEP/EPA approved QAPPs.

Boating Initiatives

Recommended Actions for Citizen Groups and All Levels of Government

- Conduct an assessment of current and potential boat pump out facilities and develop an action plan to ensure that these facilities are sufficient;
- Conduct ongoing boater education campaigns;
- Give the U.S. Coast Guard the authority to enforce ballast water requirements; and
- Ensure safe vessel maintenance practices at local marinas and boat yards through a combination of ongoing education and enforcement.

Innovative Strategies: Financing

Many of the specific action items recommended in this Action Plan will without question require more funding to implement. Discussions during the preparation of this Plan turned again and again to the fact that most of the problems outlined here are the result of inadequate funding, unreliable funding streams, and decades of deferred maintenance. Both federal and state funding have declined steadily in the face of inflation over the last few decades, and have fallen precipitously in the last few years. Government agencies at all levels and particularly municipalities will need financial help for these recommended actions to be implemented within a reasonable time

such as encouraging water conservation). In addition, local governments need to demand mitigation of water and sewer problems from developers who wish to avail themselves of these public services.

Recommended Action for State and Federal Governments

- Sewer maintenance and improvement should be treated as highway construction and maintenance are today, with a dedicated user fee-based funding source. Just as federal fees from the retail sale of gasoline are placed in a Trust Fund to pay for highway maintenance, dedicated water-related user fees should pay for the tremendous backlog of maintenance needed for wastewater infrastructure. For example, user fees could be placed on water-based products such as bottled water, soft drinks, etc.; and
- It is essential that funding and staffing at environmental agencies be restored to at least to Massachusetts Fiscal Year 2002 levels. More state and federal technical assistance as well as grant money is needed if municipalities are to fulfill their watershed responsibilities, many of which are mandated by federal and state government.

Recommended Action for Municipal Government

- Water and sewer user fees must be raised to adequately reflect the real costs of these services, especially the costs of addressing deferred sewer maintenance, and the environmental costs of surface and ground water shortages;
- User fee based revenue streams must be created to provide consistent funding for municipal stormwater management and septic system maintenance responsibilities;
- Broaden the “conventional” view of water and sewer infrastructure. Traditionally sewer and water authorities view their roles purely in terms of “pumps and pipes,” ignoring larger questions of watershed management and maintaining their “watershed infrastructure.” In the coming century, where water resources will be increasingly constrained, water and sewer authorities must view their roles more holistically; and
- To minimize fee increases, local governments should do much more on the “demand side” to reduce public water and sewer use (see the many action items on this subject, above,

Innovative Strategies: Regional Collaboration

Recommended Action for Government and Citizens

- Municipalities, with assistance from citizen groups, should take advantage of economies of scale by collaborating on things like:
 - water quality monitoring and testing,
 - public education (e.g., stormwater and water conservation),
 - pilot projects (e.g., development of a “septic utility”),
 - joint purchases of equipment and bidding for services (e.g., vacuum trucks, sewer leak detection equipment),
 - training of town boards (e.g., re/ NPDES Stormwater PhaseII),
 - development of model Bylaws,
 - development of model BMPS (e.g., for sewer pipe installation);
- Improve state interagency coordination of state watershed-related activities (which has deteriorated badly since the abandonment of EOEAs watershed initiative);
- Institutionalize communication and cooperation between towns, water suppliers and citizen groups in each watershed; and
- Joint lobbying effort on state and especially federal funding by municipalities, citizens, nonprofits, and the private sector.

Innovative Strategies: Adapting to Local Conditions

Recommended Action for Government and Citizens

- “Fine tune” materials produced collaboratively (see above) to reflect local conditions (municipal government and/or citizen groups);
- Identify the locations of the most pressing local problems (municipal governments and citizen groups); and
- Establish citizen/advocate committees for each town to strengthen the constituency for sound watershed management and make their voices heard (citizen groups).

Boston Inner Harbor Watershed Priority Action Items

Thanks to the ongoing efforts of the Massachusetts Water Resources Authority, the Boston Water and Sewer Commission and others, water quality conditions in Boston Harbor have dramatically improved over the past 15 years. At the same time, state, local and non-profit organizations have been working together to improve public access and address other environmental problems facing the Harbor.

Despite significant progress, the Inner Harbor is still more polluted than many other areas of Boston Harbor. Working toward the following priority goals will ensure continued improvement and restoration of the natural resources of the City of Boston and Inner Harbor areas covered by this Assessment:

- Reduce Bacterial Pollution;
- Reduce Polluted Stormwater Runoff;
- Reduce Floatable Debris;
- Expand Public Access;
- Promote Watersheet Activation;
- Restore Boston Harbor Beaches;
- Protect Boston Harbor from Marine Invasives;
- Evaluate Unknown Pollutant Loadings; and
- Promote Long-term Stewardship for Boston Harbor.

Reduce Bacterial Pollution

Boston's Inner Harbor continues to experience bacterial pollution, particularly following heavy rainstorms. The following actions are recommended to further reduce bacterial pollution.

Recommended Actions

- Complete Massachusetts Water Resources Authority Combined Sewer Overflow Control Program;
- Complete Boston Water and Sewer Commission sewer separation projects;
- Continue Boston Water and Sewer Commission programs to expand stormwater remediation and Best Management Practices;
- Identify and reduce bacteria contributions from other sources such as recreational and commercial boats;
- Promote boat pump out facilities;
- Reduce waste from pets and other animals through outreach and education projects; and
- Continue bacteria monitoring programs to track progress.

Reduce Polluted Stormwater Runoff

Because the City of Boston sub-watershed is 47.7% impervious and highly developed, stormwater pollution continues to pose problems for

water quality. The following actions are recommended to further reduce pollution associated with stormwater runoff.

Recommended Actions

- Incorporate innovative pilot stormwater treatment projects into waterfront development projects, particularly along Fort Point Channel or the South Boston waterfront;
- Expand watershed-wide Best Management Practices (street sweeping etc.);
- Expand Best Management Practices for waterfront industrial users;
- Expand Best Management Practices for boat maintenance facilities;
- Educate the public about pet waste;
- Ensure safe vessel maintenance practices at local marinas and boat yards;
- Track progress of municipal stormwater management plans and implementation of best management practices; and
- Work with Logan Airport to reduce polluted runoff (although East Boston is not considered part of the City of Boston watershed for this project, it is a significant potential source of polluted runoff to the Inner Harbor).

Reduce Floatable Debris

The Boston Harbor Marine Debris Cleanup Project has been successfully removing floatable debris from the Inner Harbor since 2001. Opportunities exist to expand outreach, education and waterfront efforts to reduce sources of debris before they enter the Harbor. In addition, limited funding has kept the program from providing full coverage of the Inner Harbor during the past two years. The following actions are recommended to address floatable debris in Boston Harbor:

Recommended Actions

- Continue on-water program to remove floatable debris;

- Expand funding for program to ensure adequate coverage of Inner Harbor;
- Expand education, outreach and enforcement to reduce sources of debris;
- Conduct community-based waterfront and beach cleanup projects; and
- Incorporate debris management requirements into conservation commission ‘Orders of Condition’ for waterfront construction and redevelopment projects.

Expand Public Access - Harborwalk

Providing public access to the waterfront is essential to ensuring that the public can take full advantage of the benefits associated with the ongoing restoration of Boston Harbor. Successful creation of the Harborwalk will result in continuous public walkways, waterfront parks, seating, interpretive signage, public boat ramps, and access to Boston Harbor and the Boston Harbor Islands National Park Area. To date, Harborwalk along the City of Boston watershed is approximately 70 percent complete. The following recommended actions are needed to expand public access to the Inner Harbor and beyond.

Recommended Actions

- Complete Harborwalk segments;
- Ensure implementation of Central Artery/Tunnel Project mitigation requirements associated with creation of new Harborwalk and other public spaces;
- Promote incorporation of Harborwalk and other public access or viewing opportunities at maritime industrial sites;
- Expand Harborwalk public amenities such as seating, restrooms, interpretive signage, facilities of public accommodation, and waterfront parks;
- Promote public programming at Harborwalk sites;
- Ensure Harborwalk connections, including:

- Rose Kennedy Greenway,
- Public Transit (land and water),
- Boston Harbor Islands National Park,
- South Harbor bike trail to inner city;
- Improve handicap accessibility along the Harborwalk;
- Incorporate public access opportunities into waterfront development projects; and
- Implement interpretive signage throughout the Harborwalk.

Promote Watersheet Activation

The restoration of water quality in Boston Harbor has led to a dramatic increase in boater traffic and the desire to create on-water activities throughout Boston Harbor. Coordinated efforts are needed to ensure that Boston Harbor has an active watersheet that expands public access, provides adequate water transportation, and balances priorities among boaters, tourists, commuters, and maritime industrial users. The following actions are recommended.

Recommended Actions

- Increase public boat ramps and transient dock space;
- Implement recommendations of the Fort Point Channel Watersheet Activation Plan;
- Promote affordable water transit service for commuters and tourists;
- Promote adequate ferry service to Boston Harbor Islands National Park Area; and
- Expand educational/interpretive programming on Harbor boat tours.

Restore Boston Harbor Beaches

Thanks to the collaborative efforts of the Massachusetts Department of Conservation and Recreation, the City of Boston, the Massachusetts Water Resources Authority and others, Boston Harbor's Inner City beaches have been transformed from neglected waterfront areas to landmarks that attract thousands of visitors on hot summer days. Inner Harbor Beaches in South Boston and Dorchester Bay generally meet water quality standards for swimming on 90% of summer days. However, pollution problems persist following heavy rainstorms. In addition, potential funding or staffing shortages could jeopardize the results of landside restoration projects. The following actions are recommended to ensure continued restoration of Boston Harbor Beaches.

Recommended Actions

- Eliminate remaining bacteria problems (see separate goal of reducing bacterial pollution);
- Ensure adequate maintenance and staff;
- Promote public programs; and
- Continue water quality monitoring and flagging programs.

Protect Boston Harbor from Marine Invasives

Boston Harbor is faced with the difficult challenge of identifying and preventing potential damage to natural habitat and marine life associated with marine invasives. Recent surveys have identified at least 13 species of marine bio-invaders in Boston's Inner Harbor. The following actions are recommended to address the environmental problem of marine invasives in the Inner Harbor.

Recommended Actions

- Implement recommendations of the Massachusetts Aquatic Invasive Species Management Plan;
- Enact federal legislation to give U.S. Coast Guard authority to enforce ballast water requirements;

- Implement recommendations of Northeast Aquatic Nuisance Species Task Force; and
- Expand monitoring and public education programs.

- Continue efforts to monitor and protect groundwater levels;
- Expand youth environmental education programs regarding Boston Harbor; and
- Expand public awareness and education programs about pollution prevention and the value of natural resources of Boston Harbor.

Evaluate Unknown Pollutant Loadings to Boston Harbor

Due to the scope of the Boston Harbor Project, numerous studies have monitored the impact on water quality in Boston Harbor from wastewater through outfalls and combined sewer overflows. Less is known, however, about the types and sources of stormwater pollutants, and pollutant loadings from other sources. The following actions are recommended to evaluate unknown pollutant loadings to Boston Harbor.

Recommended Actions

- Evaluate inputs from the Charles River, Mystic River, Chelsea Creek, and Neponset River to assess overall condition of Inner Harbor;
- Identify / quantify other sources of pollutant loadings to Boston Harbor; and
- Conduct nutrient monitoring in Dorchester Bay to determine if sediments are contributing to nutrient levels in the water column

Other Goals and Actions

The following additional actions and goals are also recommended.

Recommended Actions

- Protect Boston Harbor from major oil or other spills;
- Expand efforts to remediate brownfield sites;
- Revise Chapter 91 regulations to differentiate between green open spaces and impervious open spaces;

Neponset River Watershed Priority Action Items

The following Neponset River Watershed Priority Action Items for 2004 – 2009 are meant to address the key problems identified in the 2004 Neponset River Watershed Assessment (which is part of the larger “Boston Harbor South Watersheds 2004 Assessment”). These Action Items represent localized priorities for the Neponset River Watershed and are meant to be read in conjunction with, and to augment, the “Common Action Plan for All Boston Harbor South Watersheds.”

Priority action items for the Neponset River Watershed mainly revolve around the issues of water quality and water quantity (which in turn affect habitat, recreational opportunities, etc.). The larger issue of growth management, which has a profound impact on water quality and quantity, is largely beyond the scope of this document. However, there are a number of action items that are closely related to growth, such as minimization of impervious surfaces for new development, improved stormwater management, and wastewater improvements that will increase groundwater recharge.

Finally, priority action items are correlated to priority locations whenever appropriate, in so far as available information allows. There are, however, undoubtedly additional locations where specific problems are as bad or worse than those identified in this document. Thus the identity of priority locations for the implementation of priority action items is likely to change as more information becomes available.

Sewer Systems: General

Despite the issuance of a Bacteria (fecal coliform) Total Maximum Daily Load (TMDL) covering the entire Neponset River Watershed in 2002, bacteria and nutrient levels remain perhaps the most serious problems in

the watershed. Based on the extent of these problems, all of the sewer system problems discussed below can undoubtedly be found in many of the watershed’s municipalities. It is often difficult to know, however, which sewer-related problems are causing the bacteria problem without significant investigative work. Actions needed to address bacteria are thoroughly discussed in the “Common Action Plan.” Priority action items and locations within the Neponset River Watershed are listed below.

Priority Action Item for State, Municipalities and Citizen Groups

- Execute the basin-wide implementation strategy relating to sewer systems contained in the 2002 TMDL for Bacteria in the Neponset River Basin.

Priority sites for investigation and remediation of bacterial problems from unknown sewage sources:

- Beaver Meadow Brook (Canton/Stoughton); severe wet weather bacteria problem
- East Branch (Canton); wet weather bacteria problem
- Middle Mainstem (Boston, Canton, Dedham, Milton, Norwood, Westwood); wet weather bacteria problem
- Pecunit Brook (Canton); wet weather bacteria problem combined with high nutrients
- Ponkapoag Brook (Canton/Randolph); wet weather bacteria problem combined with high nutrients

- Purgatory Brook (Norwood/Westwood); wet weather bacteria problem combined with high nutrients
- Steep Hill Brook (Stoughton/Sharon); wet weather bacteria problem combined with high nutrients
- Traphole Brook (Norwood/Walpole/Sharon); wet weather bacteria problem combined with high nutrients.

- The state should fund a project to assess existing municipal I/I “banking” programs and provide outreach/technical assistance to improve their efforts; and
- The state should study the feasibility of private infiltration/inflow removal programs at the state and/or municipal level and provide outreach and technical assistance to implement them.

Sewer Systems: Illicit Connections

Priority action for State, Municipalities and NepRWA

- Execution of the basin-wide implementation strategy relating to illicit discharge detection and elimination contained in the 2002 TMDL for Bacteria in the Neponset River Basin. The TMDL states: “A comprehensive program is needed to ensure illicit sources are identified and that appropriate actions will be taken to eliminate them. NepRWA has been successful in carrying out such monitoring, identifying sources, and, in some case(s), mobilizing the responsible municipality to begin to take corrective action.” US EPA’s recent Stormwater II regulations for municipalities also mandate illicit discharge detection and elimination. This effort needs to be implemented in all cities and towns in the watershed.

Sewer Systems: Exfiltration

Priority Actions

- Execution of the basin-wide implementation strategy relating to leaking sewer pipes contained in the 2002 TMDL for Bacteria in the Neponset River Basin. The TMDL gives primary responsibility to municipalities;
- EPA and DEP should follow up on 308 letters issued to Norwood and Milton;
- Norwood should continue the Meadow Brook investigation and remediation; and
- Milton should continue Unquity Brook investigations.

Sewer Systems: Infiltration and Inflow (I/I)

Priority Actions

- Execution of the basin-wide implementation strategy relating to leaking sewer pipes contained in the 2002 TMDL for Bacteria in the Neponset River Basin. The TMDL gives primary responsibility to municipalities;
- The state and municipalities within the Watershed should establish/maintain 4:1 mitigation banking for new development;

Priority sites in the Neponset River Watershed with known exfiltration problems

- Meadow Brook (Norwood); severe dry and wet weather bacteria with high nutrients

Sewer Systems: Sewer Extensions and Capacity Expansions

Priority Actions

- 4:1 mitigation of infiltration and inflow for all sewer extensions based on both peak and annual flow;

- Sewer extensions used as wastewater alternative of last resort; and
- Focus on source reduction (infiltration and inflow) rather than capacity increases to remediate SSOs and surcharging.

Sewer Systems: Sanitary Sewer Overflows (SSOs)

Sanitary sewer overflows during storm events are a major cause of bacterial (as well as nutrient pollution) of surface waters in the Neponset River Watershed. The Clean Water Act requires local sewer authorities to report SSOs, with MA DEP and USEPA then issuing letters requiring remedial action. In the Neponset Watershed, such letters have been issued to Milton and Norwood, but little or no follow-up action has been taken by DEP or EPA.

Priority Actions for State and Federal Governements

- DEP should produce a GIS data layer identifying locations of SSOs and then meet with sewer authorities and interested citizens to make sure the maps are accurate and complete. DEP and EPA should consistently follow up with towns that have SSOs to ensure that remediation plans with timetables are adopted. Enforcement action should be initiated if towns are unresponsive. Sewer extensions should be barred in any such community that does not have an SSO remediation plan; and
- EPA and DEP should follow up on 308 letters issued to Norwood and Milton.

Priority Actions for Local Authorities

- Execution of the basin-wide implementation strategy relating to SSOs contained in the 2002 TMDL for Bacteria in the Neponset River Basin. The TMDL gives primary responsibility to municipalities;
- Local authorities should help identify SSO locations and ensure that solutions are implemented in a timely fashion; and
- Local authorities should also educate the public about SSOs

and their causes.

Priority Actions for Citizen Groups

- Citizen groups should help locate SSOs and should educate the public about SSOs and their causes. They should also organize locally to pressure for SSO remediation and, as a last resort, file Clean Water Act citizen lawsuits to mandate appropriate action.

Priority locations for SSO remediation:

These areas have been found by NepRWA in 2001 - 2003 to violate Massachusetts Water Quality Standards (MA DEP, 1996) for bacteria for “Class B” waters (not designated as bathing beaches):

- Hawes Brook (Norwood); violates bacteria criterion > 25% of time in wet and dry weather:
- Pequit Brook (Canton, Randolph); violates bacteria criterion > 50% of time in wet weather and > 25% in dry weather*;
- Pine Tree Brook (Milton); violates bacteria criterion 10 – 25% of the time in wet weather*; and
- Unquity Brook (Milton); Violates bacteria criterion > 50% of time in wet weather*; among highest nutrient levels in the watershed.

Stormwater Management and Groundwater Recharge

This is a critical issue in the Neponset River Watershed from a water quality and groundwater recharge perspective. Significant runoff from impervious surfaces are almost certain to exist in all watershed stream segments in urbanized areas and near major transportation corridors and shopping centers.

Priority Actions

- State and federally funded volunteer-based water quality testing (using cash and in-kind support from municipal, state,

and private sources) should be expanded to support Phase II activities through annual outfall inspection and mitigation, collaborative education and public participation efforts;

- The state should require implementation of town-wide bylaws under Phase II with emphasis on recharge that applies to both new development and redevelopment;
- The state should undertake an evaluation of current Phase II bylaws and provide outreach and technical assistance to towns to improve the bylaws and their administration;
- The state should undertake a watershed-wide assessment of potential public and private stormwater retrofit sites;
- The state and federal governments should increase availability of grant funds for remediation, and municipalities and citizen groups should maximize use of available grant funds;
- The state should undertake a feasibility study for the creation of stormwater utilities at the municipal level in the Neponset River Watershed;
- The state or federal government should undertake an effort to produce a model bylaw for low impact development, followed by outreach and technical assistance to towns;
- There should be a collaborative multi-town, state, and citizen group effort to implement the educational/public participation aspects of Phase II more effectively; and
- Regarding nutrients, the state should produce a Watershed Based Plan or a TMDL.

Priority sites for remediation of runoff from impervious surfaces

- East Branch mainstem (Canton); violates bacteria criterion > 25% of time in wet weather*];
- Estuary (Boston, Milton, Quincy); violates bacteria criterion > 50% of time in wet weather and > 25% in dry weather*; among highest nutrient levels in the watershed;

- Germany Brook (Norwood/Westwood); violates bacteria criterion > 50% of time in wet weather and > 25% in dry weather*; among highest nutrient levels in the watershed;
- Hawes Brook (Norwood); violates bacteria criterion > 25% of time in wet and dry weather*; trash and debris from runoff;
- Lower Mainstem (Boston, Milton); violates bacteria criterion > 50% of time in wet weather*; among highest nutrient levels;
- Middle Neponset mainstem (Boston, Canton, Dedham, Milton, Norwood, Westwood); violates bacteria criterion > 25% of time in wet weather*; trash and debris from runoff;
- Mother Brook (Boston, Dedham); violates bacteria criterion > 25% of time in wet and dry weather*; among highest nutrient levels in the watershed; trash and debris from runoff;
- Pequit Brook (Canton, Randolph); violates bacteria criterion > 50% of time in wet weather and > 25% in dry weather*];
- Pine Tree Brook (Milton); violates bacteria standard 10 – 25% of time in wet weather*; and
- Unquity Brook (Milton); violates bacteria criterion > 50% of time in wet weather and > 25% in dry weather*; among highest nutrient levels in the watershed; trash and debris from runoff.

* Found by NepRWA in 2001 - 2003 to violate Massachusetts Water Quality Standards (MA DEP, 1996) for bacteria for “Class B” waters (not designated as bathing beaches)

Priority Sites for remediation of runoff of fertilizers, animal wastes, and organic material from lawns, parks, golf courses, etc.(Partial List)

- See “Management of Landscaped Areas”, below

Septic Management

As stated in the “Common Action Plan,” septic systems effectively recharge groundwater at a local level, as opposed to sewer systems

that take water from the Neponset Watershed and discharge it directly (via MWRA) into Massachusetts Bay. For this reason, septic systems and other decentralized approaches to wastewater treatment are the environmentally preferable method of sewage disposal in the Watershed.

Priority Actions

- DEP should consider sewer extensions and expansions only as a last resort as a substitute for decentralized wastewater treatment systems. Septic should be the preferred method of wastewater treatment for family homes where lot sizes permit; and
- Septic utilities should be considered in every town where a significant percentage of the population uses septic systems. The Neponset River Watershed Association (NepRWA) is currently working with the Town of Walpole to examine possible implementation of a septic utility concept which could:
 - maximize regular pumping of all septic systems,
 - decrease septic pumping costs,
 - “insure” septic owners for the costs of major repairs and replacement,
 - increase municipal awareness of septic system failures, and/or
 - establish a dedicated revenue source (grants or loans) for septic repair and replacement.

Priority Sites for Remediation

- Unquity Brook (Milton); failed septic systems specifically suspected near headwaters

Other Priority Sites. The following Neponset River Watershed towns are at least 30% on septic systems, and thus priority sites for

septic-related action items:

- Canton; 30% septic;
- Foxboro; 95% septic;
- Medfield; 67% septic;
- Sharon; 98% septic;
- Stoughton; 36% septic; and
- Walpole; 36% septic [NepRWA and Town of Walpole now working on citizen education and possible development of a septic utility].

Management of Landscaped Areas

Priority Actions

- Pursuant to Phase II stormwater rules, a multi-town, state and private collaboration should be established to achieve effective public education and public participation on methods to limit stormwater runoff from lawns, etc.

Priority sites for remediation of runoff of fertilizers, animal wastes and organic material from lawns, parks, golf courses etc.

- Germany Brook (Norwood and Westwood); violates bacteria standard > 50% of time in wet weather and > 25% in dry weather*; among highest nutrient levels in the watershed;
- Ponkapoag Brook (Canton and Randolph); violates bacteria standard > 25% of time in wet weather*; among highest nutrient levels in the watershed;
- Steep Hill Brook (Stoughton and Sharon); violates bacteria standard > 25% of time in wet weather*; among highest nutrient levels in the watershed; and
- Unquity Brook (Milton); violates bacteria standard > 50% of time in wet weather and > 25% of time in dry weather*; among

highest nutrient levels in the watershed.

* Found by NepRWA in 2001 - 2003 to violate Massachusetts Water Quality Standards (MA DEP, 1996) for bacteria for “Class B” waters (not designated as bathing beaches)

Water Supply and Streamflow

The key limiting uses which would define “adequate” instream flow levels for the Neponset River include flows necessary to preserve recreation (canoeing) on the freshwater mainstem through Boston during the summer, flows needed to ensure adequate inundation of existing anadromous fishery spawning grounds at Lower Mills from April through July, and flows needed to sustain viable resident freshwater fisheries throughout the watershed during the dry summer months. Causes of low instream flow include excessive use of water drawn from the Neponset Watershed, especially in summer months (this includes water obtained from public water supplies and from the approximately 1,100 private wells in the watershed); interbasin transfer, especially via the MWRA sewer system; manipulation of water levels in impoundments; and, most importantly, poor stormwater management and sewer infiltration and inflow.

Although virtually every town in the watershed has experienced a water emergency and imposed some sort of water use restrictions to deal with it, little has been done comprehensively to reduce water use. The Massachusetts DEP is to be commended for its recent issuance of a Water Management Act Guidance, with mandatory water conservation measures for communities in watersheds or subwatersheds designated as “stressed” by EOE. Unfortunately, most of the Neponset Watershed is “unassessed” and the moderate to low stress levels EOE did set for portions of the watershed are, in our view, not reflective of the true levels of stress that the entire watershed is experiencing (see “2004 Neponset River Watershed Assessment.”

Priority Action for Federal Government

- Development by USGS of a ground and surface water model for the Neponset watershed to aid in predicting effects of water withdrawals and other major water-related activities requiring a federal, state or local permit, and to aid in evaluating restoration

alternatives.

Priority Actions for State Government

- Based on existing site specific data and DEP recommendations, reclassify all of the Neponset River Watershed as a “highly stressed basin,” thus subjecting it to the strictest state water conservation standards; alternatively, set stricter conservation standards for low stressed and unassessed basins;
- The state should establish a “Net Gain” standard for all permitting decisions effecting Neponset River Watershed water supply; and
- The state should commence a dialogue with dam owners regarding the coordination of water release practices to ensure minimum daily summer flows, especially in times of drought.

Priority Actions for Municipalities and Water Suppliers

- Adopt and enforce Irrigation System Performance Standards (including night watering of lawns) as described in “Options for Managing the Impact of Private Irrigation Wells and Surface Diversions on Wetlands, Waterways and Public Water Supplies”, June 30, 2003, prepared by NepRWA and Alexandra Dawson for the Westwood Conservation Commission and the MA Department of Fisheries, Wildlife and Environmental Law Enforcement;
- All municipalities and water suppliers need to dedicate meaningful funding to water conservation activities and effective outreach, which is achievable through a fee of \$10 to \$20 per year per service connection; and
- Towns should collaborate to maximize effectiveness in water conservation efforts.

Priority Action for Citizen Groups

- Complete pilot dam survey in East Branch of Neponset River and expand it to the entire basin.

Priority Sites for Streamflow Improvements

- Primary cause, excessive water withdrawals
 - Beaver Brook (Sharon); habitat constraints due to low base flows; substantial additional streamflow impacts expected from projected 22% increase in water withdrawals from 1995 to 2010;
 - Beaver Meadow Brook (Canton and Stoughton); habitat constraints due to low base flows;
 - Middle mainstem (Boston, Canton, Dedham, Milton, Norwood, Westwood); substantial streamflow impacts expected from projected 28% increase in water withdrawals from 1995 to 2010;
 - Mill Brook tributary of Mine Brook (Medfield and Dover); habitat constraints due to occasionally severe low flows; substantial streamflow impacts expected due to projected 99% increase in water withdrawals by 2010;
 - Purgatory Brook (Norwood, Westwood); substantial streamflow impacts expected due to projected 25% increase in water withdrawals from 1995 to 2010;
 - School Meadow Brook (Walpole, Sharon, Foxborough); substantial streamflow impacts expected due to projected 25% increase in water withdrawals from 1995 to 2010;
 - Unquity Brook (Milton); and
 - Upper mainstem (Canton, Foxborough, Norwood, Walpole); substantial streamflow impacts expected due to projected 69% increase in withdrawals from Neponset Reservoir.
- Primary cause: impoundments and channelization
 - Lower Neponset mainstem (Boston, Milton); channelization;
 - Massapoag Brook (Sharon and Canton); channelization in lower reaches; habitat constraints due to low base flows;

- Mother Brook (Boston, Dedham); channelization;
- Pinetree Brook (Milton); on DEP impaired waters list for habitat alterations; and
- Plantingfield/Purgatory Brook (Norwood, Westwood); channelization.
- Primary cause: water withdrawals and impoundments/channelization
 - East Branch (Canton); habitat constraints due to low flows; extreme high temperatures due to shallow impoundments;
 - Pequit Brook (Canton, Randolph); habitat constraints due to low base flows; and
 - Steep Hill Brook (Stoughton, Sharon); habitat constraints due to low base flows
- Primary cause: complex or unknown
 - Estuary (Boston, Milton, Quincy); degraded anadromous fish run due to low flows;
 - Mine Brook (Medfield and Walpole); severe low flows; and
 - Spring Meadow Brook (Walpole).

Riverine Habitat

Priority Actions for State Government

- Develop and implement a plan to fully or partially remove the Tileston & Hollingsworth (T&H) and Baker Dams from the lower Neponset River and remediate contaminated sediments. This would make the river navigable from Dorchester Bay to 17 miles inland of the Baker Dam, and would restore a great deal of the historic anadromous fish runs to the watershed;

- In the short term, fix the T&H Dam so as to minimize fluctuation of water levels beneath the dam;
- Implement to the maximum extent feasible EOEAs Neponset Wetlands Restoration Plan using available grant funds;
- Implement Neponset Salt Marsh Restoration Project immediately to avoid loss of federal funding;
- Designate Tubwreck Brook, Traphole Brook, the Mill Brook tributary of Hawes Brook, the Mill Brook tributary of Mine Brook, and the headwaters of Pine Tree Brook as Cold Water Fisheries in the state Surface Water Quality Standards; fund continuous flow and temperature monitoring to support these designations;
- Conduct ecological risk assessments of removing the other one hundred or so dams in the watershed and/or creating fish passages;
- Inventory riparian shoreline buffers and stream channels and culverts for restoration;
- Investigate and remediate the desiccation of the middle reach of Unquity Brook;
- Evaluate options to maintain/restore adequate flows in Beaver Brook and Mill/Mine Brook;
- Assess the extent and severity of contaminated sediments in the watershed and develop an Action Plan for dealing with them;
- Assess extent of invasive terrestrial and aquatic species and develop an Action Strategy;
- Develop a new open space needs and opportunities plan for the watershed as a whole; and
- Remediate contaminated sediments and abate eutrophication in Neponset Reservoir.

Priority Action for Citizen Groups

- Coordinate volunteers to annually pull up water chestnuts in

Ellis Pond (Norwood) and Clarks Pond (Walpole).

Additional Priority Locations for Habitat Improvements

- Primary problems, lack of riparian buffer and dumping of grass clippings by homeowners
 - Germany Brook (Norwood & Westwood);
 - Steep Hill Brook (Stoughton and Sharon); and
 - Unquity Brook (Milton) [see also “Primary problem: illegal dumping, below].
- Primary problem, sedimentation
 - Beaver Meadow Brook; (Canton and Stoughton); sedimentation in upper reaches;
 - Pequit Brook (Canton, Randolph);
 - Pinetree Brook (Milton); on DEP impaired waters list for habitat alterations [see also Primary problem: construction site erosion, below]; and
 - Traphole Brook (Norwood, Walpole, Sharon); severe sedimentation in lower reaches.
- Primary problem, illegal dumping
 - Hawes Brook (Norwood);
 - Lower Neponset mainstem (Boston, Milton); illegal disposal of sand-laden snow by Stop and Shop in Hyde Park;
 - Mother Brook (Boston, Dedham); and
 - Unquity Brook (Milton) [see also Primary problem: lack of riparian buffer and dumping of grass clippings].
- Primary problem: construction site erosion

- Pinetree Brook (Milton); on DEP impaired waters list for habitat alterations [see also Primary problem: sedimentation, above]; and
- Bird Pond (Walpole).

bacteria testing;

- Amend list of Category 4a Waters (“TMDL is Completed”) and Category 5 Waters (“Waters Requiring a TMDL”) in accordance with NepRWA’s May 24, 2004 comment letter on the proposed Massachusetts Year 2004 Integrated List of Waters (see next page); and
- Regarding nutrients in the Neponset River Watershed, develop a Watershed Based Plan or TMDL.

Public Access to Waterways

Priority Actions for State Government

- Create a public boat ramp in the Neponset Estuary;
- Develop a conceptual plan for a riparian trail system along the Neponset River above Paul’s Bridge;
- Complete Phase II for the Neponset River Reservation Master Plan (DCR);
- Implement NepRWAs conceptual plan for Quincy’s Riverwalk and DCRs Master Plan for Squantum Point;
- Improve canoe launch at Neponset St. in Canton, taking land by eminent domain if necessary;
- Develop a new open space needs and opportunities plan for the watershed as a whole; and
- Create a Neponset Valley Land Trust to assist local trusts and fill the many gaps where local trusts are absent.

Priority Action for Municipal Governments

- In lieu of state action, improve canoe launch at Neponset St. in Canton, taking land by eminent domain if necessary.

Watershed Assessment

Priority Action

- State, federal and municipal governments working with private funders should provide money to reestablish volunteer-based

Changes to 303d List as Proposed by NepRWA

NEPONSET RIVER WATERSHED ASSOCIATION

Page 1 of 4

499 Chapman Street, Suite 4100 B., Canton, MA 01028
 phone 781-575-8154 - fax 781-575-9971

May 26, 2004

Mr. Arthur Johnson
 Massachusetts Department of Environmental Protection
 Division of Watershed Management
 625 Main Street, Second Floor
 Worcester, MA 01608

Re: Proposed Massachusetts Year 2004 Integrated List of Waters

Dear Mr. Johnson:

As you know, the Neponset River Watershed Association (NepRWA) has conducted significant sampling of stream segments within the Neponset River Watershed. NepRWA data was cited extensively in your "Boston Harbor 1999 Water Quality Assessment Report", published in October, 2002. Data from NepRWA sampling done as late as 2003 was used in that Report.

We have now analyzed the results of our sampling from 2003 through March, 2004, most of which DEP has not yet seen (we have attached a copy of the Draft CMRW Final Report 2003 which contains full sampling results for each monitored stream segment). By comparing these sampling results to your "Proposed listing of the condition of Massachusetts' water pursuant to Sections 303(d) and 303(b) of the Clean Water Act", we have identified a number of stream segments that we feel should be added to either Category 4a Waters ("TMDL is Completed") or Category 3 Waters ("Water requiring a TMDL").

Proposed additions to Category 4a Waters (TMDL is completed for pathogens) based on MA Surface Water Quality Standard of 200 cfu/100 udl and on NepRWA sampling from 2003 through March, 2004:

- **Pecann Brook** - NepRWA sampling for fecal coliform found wet weather problems rendering the segment unusable more than 25% of the time and dry weather problems rendering it unusable more than 10% of the time.
- **Steep Hill Brook** - NepRWA sampling for fecal coliform found wet weather problems rendering the segment unusable more than 25% of the time.
- **Spring Brook** - NepRWA sampling for fecal coliform found wet weather problems rendering the segment unusable more than 10% of the time.

- **Beaver Brook** - NepRWA sampling for fecal coliform found wet weather problems rendering the segment unusable more than 10% of the time.
- **Tributor to Massachusetts Brook (segment 75-37)** - The DEP "Boston Harbor 1999 Water Quality Assessment Report" found that this segment supported primary and secondary contact recreation. However, based on EPA's correction to DEP's methodology for assessing wet weather pollution problems in the 1999 Assessment, Rice McVay of your office recently told us that DEP considers this segment as impaired for primary contact recreation due to wet weather fecal coliform problems.

Proposed additions to Category 3 Waters (Water requiring a TMDL) based on NepRWA sampling from 2003 through March, 2004:

- **Pollutant Exceeding TMDL** - Nutrients - In evaluating the stream segments listed below for nutrients, NepRWA considered the average percentage of samples where we found Total Nitrogen greater than 0.1 mg/L and Orthophosphates at more than 0.08 mg/L; Orthophosphates from 0.01 to 0.08 mg/L were also factored in by assuming that two samples in this range were equal to one sample over 0.08 mg/L. These parameters were based on water quality thresholds in Daniel, Thomas and Lewis B. 1 report, "Water in Environmental Planning," 1978, W.H. Freeman & Company, New York.
 - **Pangloss Brook** - Nutrient problems found 50% of the time.
 - **Steep Hill Brook** - Nutrient problems found 55% of the time (DUE's "1999 Boston Harbor Watershed Assessment" also cited nutrients as a "known cause" for causing this brook to only partially supporting aquatic life).
 - **Blue Tree Brook** - Nutrient problems found 50% of the time.
 - **Tripole Brook** - Nutrient problems found 50% of the time.
 - **Pockanog Brook** - Nutrient problems found 30% of the time.
 - **Pecann Brook** - Nutrient problems found 48% of the time.
 - **Lower Mainstem** - Nutrient problems found 48% of the time.
 - **Mill Brook** - Nutrient problems found 48% of the time.
 - **Beaver Bl.** - Nutrient problems found 48% of the time.
 - **NepRWA Tributary** - Nutrient problems found 46% of the time.
 - **Mill Brook** - Nutrient problems found 45% of the time.
 - **Middle Mainstem** - Nutrient problems found 36% of the time.
 - **Haves Brook** - Nutrient problems found 30% of the time.
 - **Canal Brook** - Nutrient problems found 25% of the time.
 - **Spring Brook** - Nutrient problems found 23% of the time.
 - **School Meadow** - Nutrient problems found 22% of the time.
 - **Water Brook** - Nutrient problems found 15% of the time.
 - **Beaver Meadow** - Nutrient problems found 13% of the time.

Arthur Center, Dedham North, Framingham, Needham Heights, Norwood, Quincy, Randolph, Sharon, Southwick, Uxbridge, Westwood

April 20, 2004 10:30 AM EDT

Fore River Watershed Priority Action Items

In 1996, Tellus Institute along with the communities of Braintree, Quincy and Weymouth produced the Fore River Embayment Project Report for the Massachusetts Bay Program. One of the recommendations in the report was to form the Fore River Watershed Association (FRWA) for the purpose of promoting, protecting, and improving the water quality, natural resources, cultural sites and recreational opportunities in the watershed by conducting shoreline watches, land use surveys, physical habitat surveys and water quality monitoring programs.

FRWA's original concern was the identification and the remediation of Sanitary Sewer Overflows (SSOs) in the watershed. The MWRA and the Towns of Weymouth and Braintree are currently addressing these issues with upgrades to their systems. When the upgrades are completed, federal, state and local authorities must monitor the watershed to assure that SSOs have in fact been remediated.

In more recent years, the focus of the Fore River Watershed Association has been to assure better land use practices and open space preservation within the watershed. Another important issue has been the physical habitat within the watershed. SSOs and poor land use practices have led to the closing of shellfish beds as well as the degradation of the river, streams, brooks and ponds that has had a negative effect on fisheries.

The Mini-Bays project was a team effort that brought together a wide array of state and local government officials, community leaders and concerned citizens to assess the environmental health of the Fore River embayment and create action steps to resolve the issues identified. However once the FRWA was established and began dealing with the issues of land use, public access and open space, much of the dialogue between these groups dissolved. Major development projects were

permitted without sufficient consideration of the impact on the natural resources within the watershed.

FRWA appreciates the opportunity to participate in the process of producing the 2004 Boston Harbor South Watersheds Assessment Report and Action Plan. It believes, however, that the document is incomplete without further input from the public. Therefore, once the document is completed, FRWA will post it on their website and present it at their monthly public meetings. Finally, they will issue a document that more fully reflects the public's input and present it to the Executive Office of Environmental Affairs as an addendum to the original report.

Public Access to the Waterfront

It is important to encourage shoreline uses that give the public meaningful access to river and estuary resources. Shoreline parks, shellfish beds, public marinas, beaches, sailing schools, yacht clubs, commercial and recreational fishing services, and small boat rentals are all examples of water dependant projects that are favored under M.G.L., c. 91, either as direct uses or as public benefits for non-water dependent uses. Public access to much of the private waterfront property on the Fore should be attainable via Chapter 91, the state Waterways law. Where it is not, state, regional and municipal authorities should consider purchasing such access. The more the public is allowed to enjoy the resource in a responsible manner, the more the public will appreciate and protect the resource.

General Recommended Actions for State and Municipal Government

- Expand public waterfront walkways and parks on public

property and on private property through chapter 91 licensing and other incentives;

- Expand public amenities, handicapped access, and public programs in waterfront areas;
- Connect waterfront walkways to transit and other public lands;
- Expand the number of public boat ramps, canoe launching areas, water shuttles and other water-related activities;
- Restore public beaches;
- Provide increased funding for public awareness and educational opportunities;
- Increase funding for local, state and federal environmental protection agencies so they can properly identify, permit and enforce regulations; and
- Increase funding for local authorities so they can better oversee land use issues, purchase open space and adjust zoning by-laws to better protect natural resources.

General Recommended Actions for Citizen Groups

- Identify locations for public boat launch areas;
- Advocate for public access under Chapter 91; and
- Advocate for waterfront open space acquisition.

Recommended Actions on Priority Waterfront Sites

- 20-24 St. GERMAIN STREET - DEP FILE #59-0800: The City of Quincy should seriously consider purchasing the property and returning it to the public as waterfront open space. Alternatively, the property owner should scale down the size of the houses he proposes, move them back away from the shoreline, and provide public access to the beachfront.
- MASS ELECTRIC: Efforts to guarantee public access to the shoreline on this property located on the Town River have been unsuccessful. A fence located on the site is in clear violation

of Chapter 91. DEP needs to enforce regulations and ensure public access on this site.

- SOUTHER TIDEMILL: The historic Souther Tide mill sits as an eyesore for the community, rather than an educational and tourist attraction encouraging people to come to the waterfront. Funding should be allocated to restore this important historic site as an educational and tourist attraction.
- FORE RIVER SHIPYARD: This historic shipyard produced the largest quantity of ships in the country during World War II and dates back to 1884 when Thomas Watson, assistant to Alexander Graham Bell, opened the Fore River Engine Company. The current owner is seeking a wetlands permit from the Braintree Conservation Commission to fill in the former Hayward Creek, a tributary of the Fore River, now known as the Wet Basin. In addition, the owner has filed for a Chapter 91 Determination of Applicability. Meaningful physical and visual public access and significant and meaningful connection to the Fore River need to be provided by this project. Potential public uses under Chapter 91 could include walking, fishing, sitting, boat launching and a public marina.
- PETERSON POOL AT WATSON PARK: A number of years ago, an East Braintree resident, Mr. Peterson, left a significant amount of money for the town to use to build a public pool on a site located on the shores of the Fore River. The fund for this project has risen to over \$1 million dollars. This is a great opportunity to provide public access, both visual and physical to the shoreline.
- MBTA OLD COLONY GREENBUSH RAIL WAY ACCESS: This project should provide significant and meaningful connection to the Fore River and Smelt Brook for the Weymouth Landing business and historic district. The Greenbush project has the potential to significantly detract from the shoreline unless the design for the Landing (much of which is on filled tidelands) is accomplished with respect for the surrounding natural resources. The project should provide public benefits such as facilities for walking, jogging, bicycling, picnicking, bird watching, sun bathing, swimming and launching of small boats (canoes, kayaks, etc.). The MBTA

and the Towns of Weymouth and Braintree should be held to the strictest standards of M.G.L., c. 91 when it comes to the design of Weymouth Landing station.

- **FORE RIVER POWER STATION:** This power plant is located on the former Lovell's Grove recreational site (1860-1910). A large portion of the site is filled tidelands and it is currently in non-water dependent use. Agreements have been signed among the owners, the Weymouth Historical Commission, and FRWA to provide public access on the site for fishing and other passive recreational uses along the shoreline. In addition the agreements calls for a substantial vegetated buffer along the shoreline. The Energy Facility Siting Council (EFSC) permit has instructed the owners to conduct neighborhood meetings to discuss design issues as outlined in these agreements. However these meetings have become stalled after permits were issued and construction begun. State and local officials need to be engaged in this process to assure the work is completed as outlined in the EFSC permit and the legally binding Agreements.
- **FORE RIVER POWER STATION – NORTH PARCEL:** The owners of the power plant described in the preceding paragraph also agreed to work with the Town of Weymouth, the Weymouth Historical Commission and the Fore River Watershed Association to plan and design passive recreation on this filled tideland. Talks for this have also been stalled. See above for concerns.
- **MILL COVE – NORTON ST.:** The Mill Cove area of the Fore River supports a range of waterfront land uses, including conservation lands, private residences, a marina, boat yard, and boat storage area. Current activities in the area support water-dependent uses; however, their condition is visually detracting. Several parcels in this area have been earmarked by the Waterfront Committee as being potential space for a waterfront park to be purchased by the Town of Weymouth. The Town should act on this and pursue public access opportunities. Residential houses along Norton Street and Mill Cove should be re-zoned as they are currently zoned Industrial 2, which means they could be torn down and redeveloped for industrial

uses.

- **116 BRIDGE STREET:** Located in this densely populated business-zoned area of Route 3A is an 11,630 s.f. wooded parcel directly abutting historic King's Cove. This cove is subjected to the constant flow of large debris (metal, wood, plastic) onto the beach, brought in the incoming tide. Due to lack of access, it is difficult to keep this beach clean of debris. The Town-owned parcel at 116 Bridge St. could provide access for cleanup efforts. In addition, it could provide both visual and physical public access for the general public, with interpretive signs giving the history of the first settlement of Massachusetts Bay Colony at Wessagussett (1622). State and local funding should be allocated for this site.
- **WESSAGUSSETT MEMORIAL GARDEN:** On May 6, 1999, the Town of Weymouth's Town Meeting members voted to save a 4 acre parcel of woodland and wetlands with a natural underground spring for Open Space. This is the only open space in the area of the first settlement of Massachusetts Bay Colony at Wessagussett. The site is being developed for passive recreation with gardens and walking trails. The parcel abuts an historic site, 43 Bicknell Rd., where in 1900 the tomb of seven of the first settlers of the Thomas Weston Colony were discovered. The owners of 43 Bicknell Rd. are willing to provide access through their one acre parcel from the site directly to the Fore River. This would be a great opportunity to provide public access to the shoreline. Funding should be allocated for making this transaction come to fruition.
- **MILL COVE MARSHLAND:** Boston Edison owns approximately 15 acres of marshland in the Mill Cove section of the Fore River between the rivers edge and the future Greenbush Railroad right-of-way. This area could provide a wonderful spot for residents to access the shoreline with its flat land mass and small shrubs and trees making it a very pleasant area. Access could be gained from the Regina Road railway underpass and via Hibiscus Avenue in Idlewell. There are a variety of possible uses for this site, including walking, jogging, bicycling, picnicking, bird watching, sun bathing, swimming and launching for small boatst (canoes, kayaks, etc.). Key

players in making this happen are the Town of Weymouth, Boston Edison, the MBTA and the MWRA. Funding sources could come from the MWRA and Boston Edison.

Other Open Space

Recommended Actions for Priority Open Space Sites

- **KING'S COVE POINT:** The Town of Weymouth is at the present time updating their 5-year Action Plan for Open Space. This privately owned 39,280 s.f. parcel directly abuts King's Cove at the Fore River and is of particular interest. This peninsula is the remains of the foot of Hunt's Hill where the first settlers of Massachusetts Bay Colony set up a trading post in 1622. It is also the site of the N. Porter Keen Shipyard (1876-1891), where the world's largest four-masted schooner, "The Haroldine" was built and launched in 1884. The parcel is presently assessed at \$34,000. Federal, state or local funding should be allocated to purchase this site for historic and environmental preservation.
- There are four sites in the City of Quincy's Open Space Plan, three of which have been there for more than fifteen years, which are currently subject to development pressure. The amount of protected open space in this area has not increased in acreage in decades. The City of Quincy has funded \$3 million, but full protection of all four sites would cost more like \$20 million. Local officials and state agencies should allocate \$20 million to obtain the following parcels:
 - **HAZELTINE:** The sixty-five acres of protected land of Faxon Park is only a stone's throw away from an additional fifty plus acres of protected land in Braintree. A critical link between these two parks, the Hazeltine site is a 13 acre undisturbed forest with a small pond. Condominium development is now being planned on this site.
 - **271 SEA STREET:** This is the third highest ranked site in Quincy's open space plan. A developer is proposing to build 12 units on this small but critical three plus acre

site that is now home to a large variety of wildlife. This low-lying site provides a thick, lush canopy for many kinds of bird and small mammals. The adjacent degraded Broadmeadow Marsh is on the cusp of being completely rehabilitated to create more than 30 acres of wetlands and a 40-acre upland, passive recreation park. The three acres of 271 Sea Street are needed to provide a diversity of wildlife to this critical area.

- **HOSPITAL HILL:** No effort in the city has been able to gain as much local neighborhood support in such a short period of time as the Hospital Hill Association's efforts to protect this parcel, which has served as a quiet park for the neighborhood for many years. Quincy Medical Center is proposing to eliminate one third of the four acre wooded site and to use the rest for storm water detention.
- **EDGEWATER DRIVE:** The last site on the Open Space Plan within the Fore River Watershed is on Edgewater Drive in Houghs Neck. Although the site is only a gravel parking lot, its location is important. Used for decades as a boat launch, the owner now wishes to build housing on the site, eliminating a great location for the public to access the ocean. If funding to purchase this site is not forthcoming, the owner should be required under Chapter 91 to keep the boat ramp and continue to provide public access.

Physical Habitat

Riverine habitat has been greatly degraded in the Fore River Watershed in streams, ponds and wetlands as well as along the shore, due to pollution, low flows, contaminated sediments, invasive plant species, and destruction of natural vegetation along much of the shore. Dams and impoundments that no longer serve any useful purpose have degraded the many anadromous fish runs in the Watershed. Due to high bacteria counts, shellfish beds in Mill Cove have been closed for 3 decades. Other areas within the watershed that support large shellfish beds are also contaminated and are not allowed to be dug after a day or two of rain.

Recommended Actions to Protect Wetlands

- Provisions of the Massachusetts Wetlands Protection Act and its Regulations should be enforced at the following sites:
 - QUINCY HIGH SCHOOL: The City is taking steps to fill three acres of wetlands in the Quincy Center area at Faxon Hill and replicating the wetlands elsewhere. The City of Quincy should reconsider their choice in location for the new High School facility.
 - MWRA BLUE HILLS COVERED STORAGE PROJECT: The MWRA continues to ignore the standard 1:1 ratio of wetland replication. MWRA must be held to the same standards as everyone else.
 - QUARRY HILLS LAND FILL CLOSURE/GOLF COURSE: Clay continues to flow downstream and inundate Black's Creek with silt at every rainfall, in violation of the Wetlands Protection Act. Black's Creek feeds into Wollaston Beach and Quincy Bay.

Recommended Actions to Restore Fisheries

- RIVER HERRING IN THE MONATIQUOT RIVER: Both blueback herring and alewife are currently found in low numbers. The spawning run of river herring appears to be increasing in recent years and could be enhanced through restoration efforts. Funding should be provided to the Division of Marine Fisheries to assist with these efforts.
- RAINBOW SMELT are a common species in the watershed and support a modest sport fishery. One of the largest smelt runs in Massachusetts Bay is located on the Smelt Brook tributary. A large amount of spawning habitat is available, although it is impacted by stormwater and degradation of fish passages and habitat. As part of the MBTA Greenbush mitigation, the Town of Braintree is daylighting 150 feet of Smelt Brook that has been underground in pipes for decades. Funding should be provided to the Division of Marine Fisheries to assist with these efforts.

- AMERICAN EEL: A common species in the estuary, salt water eel breed in fresh water. More study should be done by the state on this species and its habitat. Funding should be allocated for the Division of Marine Fisheries to assist with these efforts.
- ATLANTIC TOMCOD: A common species in the estuary. The Fore River was known for having many tomcod years ago. The population appears to have declined recently. In order to reintroduce these fish into the Fore River, studies should be done on their habitat needs. Funding should be provided to the Division of Marine Fisheries to assist with these efforts.
- WHITE PERCH were formerly found in the Fore River, but there have been no recent observations on record. In order to reintroduce these fish into the Fore River, studies should be done on their habitat needs. Funding should be provided to the Division of Marine Fisheries to assist with these efforts.
- STRIPED BASS: There is no spawning run in the Fore River. Seasonal feeding migrations provide large benefits for local commercial and recreational fisheries. Public access areas for fisherman should be made available throughout the watershed. Funding should be provided to the Division of Marine Fisheries to assist with these efforts.
- SHELLFISH BEDS: As stated in the Assessment Report, many of the shellfish beds in the Fore River Watershed are degraded. Efforts should be made to address pollution problems and restore the shellfish beds that have been closed for decades, such as those at Mill Cove. Funding should be allocated to the various municipal conservation commissions to address these issues.
- HORSESHOE CRABS: These unique creatures that date back millions of years are nesting on various beaches throughout the watershed in Weymouth and Quincy. Efforts should be made to protect this species during the egg laying and hatching season. Funding should be allocated for the Trailside Museum, the Wildlife Center and the municipal conservation commissions to study this in more detail.

Recommended Actions to Protect Shorebirds

- **OSPREY:** These birds of prey are nesting in the Boston Edison hi-tension towers along Mill Cove. Nesting towers should be built for these birds to encourage reproduction. In addition, the birds should be banded for tracking purposes. Funding should be allocated for the Trailside Museum, Hingham Wildlife Center and the Weymouth Conservation Commission to build towers and begin a banding program.
- **PEREGRINE FALCONS:** These birds of prey have been nesting without success on the Goliath Crane at the Fore River Shipyard. Many professional and amateur naturalists and birders have been working to help the success of these birds. Funding should be allocated to assist for the Trailside Museum, the Wildlife Center and the Quincy Conservation Commission to assist with these efforts.

Additional Recommended Actions for State Government

- Conduct ecological risk assessments of removing dams and/or creating fish passages;
- Assess areas of identified contaminated sediments and develop an Action Plan for dealing with them;
- Develop Open Space and Invasive Plant Inventories and an Action Plan;
- Conduct regular fish and bug sampling to better assess aquatic ecological health;
- Allow offsite riverine habitat mitigation for new development/redevelopment along waterways; and
- Accelerate expenditure of existing Open Space Bond funds for habitat restoration projects.

Watershed Assessment

The streams, ponds and estuaries in this watershed are “unassessed” by DEP. Such an assessment is critical to the development of comprehensive action plans for the watersheds.

Recommended Actions

- Provide more federal and state funding to assess all designated uses of waterbodies in this watershed, including aquatic life, fish consumption, shellfishing, primary & secondary contact recreation, and aesthetic uses.

Sewer Systems: Sanitary Sewer Overflows (SSOs)

Sanitary sewer overflows during storm events are a major cause of bacterial and nutrient pollution of surface waters and habitat in the Fore River Watershed. The Clean Water Act requires local sewer authorities to report SSOs, with MA DEP and USEPA then issuing letters requiring remedial action. A Consent Order requires the MWRA to spend \$120 million dollars in sewer infrastructure improvements. The Braintree and Weymouth sewer systems are also being updated.

Recommended Actions

- Upon the completion of the above-referenced infrastructure improvements, local and state sewer authorities must be held accountable to ensure that SSOs have in fact been eliminated or significantly decreased. Regulators must also ensure that additional pressure is not put on these infrastructures by adhering to better strategic planning;
- DEP should produce a GIS data layer identifying locations of SSOs and then meet with sewer authorities and interested citizens to make sure the maps are accurate and complete. DEP and EPA should consistently follow up with towns that have SSOs to ensure that remediation plans with timetables are adopted. Enforcement action should be initiated if towns are unresponsive. Sewer extensions should be barred in any such community that does not have an SSO remediation plan;
- Citizen groups should be encouraged to help locate SSOs and educate the public on the causes and effects of SSOs; and
- Citizen groups need to be supported and encouraged by state and federal agencies in their efforts to pressure local sewer authorities to pursue SSO remediation. State and federal

agencies must provide funding sources for citizen groups to file Clean Water Act lawsuits to mandate appropriate action.

Sewer Systems: Illicit Connections

Illegal connections are a major problem for water quality, and their detection and elimination are essential for proper stormwater management. Detection and elimination are required activities under Phase II of the federal stormwater management program.

Recommended Actions for Government

- Cities and towns must fulfill their responsibilities under Phase II Stormwater rules regarding illegal connections (including public outreach). Each community should establish a timetable for detection and remediation. The state and federal governments need to hold municipalities accountable for fulfilling their Stormwater Phase II requirements.

Recommended Actions for citizen groups

- Citizen groups should help towns identify illegal connections. This requires significant shoreline survey work. Citizen water quality monitoring, during both wet and dry weather, also provides an important source of ongoing reconnaissance to identify potential problems.

Sewer Systems: Inflow and Infiltration

Inflow consists of private individuals illegally diverting stormwater from their property into public sewers. Inflow creates very high flows over short periods, thus contributing to SSO's and greatly increasing the marginal cost of wastewater treatment (since treatment capacity is designed for times of maximum flow). Ground and rain water draining into broken sewer pipes as infiltration play a major role in preventing adequate groundwater recharge, reducing instream flows (see below) and increasing wastewater treatment costs.

Recommended Actions for MWRA

- MWRA should expand the Grant/Loan Program for both

infiltration and inflow (I/I) remediation for communities using MWRA sewers. While this has short-term costs to ratepayers, in the long term it will save money by greatly reducing the amount of water that has to be treated at Deer Island as well as by increasing the amount of clean groundwater available for public use. MWRA should require towns to “use or lose” funds from the Program within three to five years, so as not to tie up funds that other communities could use; and

- MWRA should also help educate the public on the role played by I/I (as well as illegal connections, discussed above) in creating sanitary sewer overflows during storms and in reducing seasonal river flows, as well as on the long-term cost savings from reducing I/I.

Recommended Actions for State Government

- DEP should complete and publish Sewer System Operation & Maintenance Guidelines. DEP should also require four to one remediation of I/I for new development and redevelopment, particularly in stressed basins or wherever surcharging has occurred;
- DEP should research and report on how towns are progressing on I/I identification and remediation; and
- The state should fund a study of mandatory remediation of I/I problems on private property at time of sale.

Recommended Actions for Municipalities

- The MWRA Infiltration & Inflow Task Force has identified many Best Management Practices that should be adopted by towns to identify, prioritize and remediate I/I. These recommendations should be implemented by municipalities (even in towns not using MWRA sewers);
- Municipalities should also increase public education on I/I, especially on the relationship of I/I to SSOs, and on how I/I reduction ultimately lowers sewer and water bills;
- Municipalities should adopt bylaws for new development and significant redevelopment, requiring developers to remediate

current I/I problems at a four to one ratio for each additional gallon of water they will add to the sewer system (so-called “Wastewater Banking”); and

- Municipalities should inspect new sewer extensions and connections for leakage before granting occupancy and/or other permits.

Recommended Actions for Citizen Groups

- Citizen groups should help provide citizen education on I/I, especially on the relationship of I/I to SSOs, and on how I/I reduction ultimately lowers sewer and water bills. They should also issue and publicize “report cards” on how municipalities are doing in remediating I/I. Regarding the proposals discussed above on I/I rules for new developments and for sales of homes, citizen groups can assist by studying the issues involved and developing model rules for implementing them.

Sewer Systems: Exfiltration

Exfiltration is another cause of the discharge of raw sewage into waterways. Sewage from leaking sewer pipes can reach surface waters directly or be carried there by storm sewers.

Recommended Actions for State Government

- DEP should complete and publish Sewer System Operation & Maintenance Guidelines.

Recommended Actions for Municipalities

- Municipalities can identify possible exfiltration through checking storm drains and other surface water discharge locations during dry weather, as they are required to do to identify illegal connections under federal Phase II Stormwater rules (see above); and
- The same measures that municipalities should take to remediate infiltration of sewers (see above) will also generally prevent exfiltration.

Recommended Actions for Citizen Groups

- Citizen groups should assist by conducting shoreline surveys.

Sewer Systems: Sewer Extensions and Capacity Expansion

Sewer extensions for new development can create or exacerbate low flow problems where wastewater is being discharged outside the watershed (e.g., to Boston Harbor). It can also create SSO problems by exceeding sewer pipes’ wet weather capacity. Finally, where existing homes are on septic systems and those systems fail, there is pressure to connect to, or even extend, nearby sewer mains. In addition to extending sewer lines, sewer authorities may also increase the capacity of sewer pipes in order to handle additional flows from sewer connections and extensions.

Recommended Actions for MWRA, State and Municipal Officials

- The state, along with local and regional sewer authorities, should deny sewer extensions that will exacerbate SSOs, surcharging or low streamflows without first dealing with their core causes. Infiltration and inflow, as well as illegal connections, should be remediated before sewer extensions or expansion of sewer collection system capacity is considered, especially where MWRA or state financing is involved;
- Wherever a community is experiencing SSOs or surcharges, as well as in stressed basins, new development should be required to mitigate any new proposed flow to the sewer system by remediating I/I at a four to one ratio, measured by annual daily average (and not peak) flow; and
- DEP should consider sewer extensions and expansions only as a last resort as a substitute for decentralized wastewater treatment systems. Because septic systems do much more to recharge local groundwater supplies than do sewer systems (especially where most sewerage leaves the watershed entirely and is discharged directly into Boston Harbor at Deer Island), septic should be the preferred method of wastewater treatment for family homes where lot sizes permit. See discussion below on how costs of septic systems can compare favorably to sewer

hookups.

Stormwater Management and Groundwater Recharge

Inadequate stormwater treatment is a major cause of water pollution in Boston Harbor and its tributaries. Uncontrolled runoff, especially from streets, parking lots, roofs, and other “impervious” surfaces, also steals water that would naturally recharge (replenish) groundwater supplies. Groundwater is essential to adequate water supplies as well as surface water streamflow levels. In addition, excess runoff can cause flooding.

Stormwater treatment is regulated under DEPs Stormwater Management Guidelines for projects subject to the Wetlands Protection Act and Water Quality Certification rules. Implementation of the Guidelines by conservation commissions is somewhat uneven, particularly in regard to groundwater recharge criteria. Furthermore, the Guidelines may not be adequate to restore water quality because of its overemphasis on total suspended solids and lack of attention to other pollutants such as bacteria and metals. Stormwater management outside wetland resource areas is covered by a patchwork of zoning and other rules, which vary greatly in stringency from town to town.

Recommended Actions for State and Federal Government

- DEP should develop a regional study of sites that are most in need of stormwater retrofits;
- DEP should develop an improved stormwater guidance (especially on how to handle bacteria, metals and nutrients);
- DEP and EPA should mandate stormwater bylaws with requirements as stringent as those outlined in DEPs Stormwater Management Guidelines; these bylaws should apply to all stormwater, not just that being discharged to wetlands or waterways (such bylaws are currently being developed in the North and South River Watersheds and could serve as a model);
- Financial assistance should be given by state and federal authorities for municipal implementation of federal Stormwater

II mandates, including public outreach;

- Stormwater II regulations should be strictly enforced;
- DEP and EPA should increase staffing for technical assistance to municipalities (including municipal boards), especially regarding the relationship of new development to groundwater recharge and water supply;
- DEP and EPA should fund demonstration (pilot) projects on stormwater treatment.

Recommended Actions for Municipal Government

- Implementation of all Stormwater II requirements, including those pertaining to SSOs, illegal connections, public participation and education, mapping and management of municipal facilities;
- Adopt zoning bylaws allowing, encouraging, or requiring “low impact” development for new construction and major reconstruction projects. E.G.:
 - use of stormwater retention swales rather than curbs in subdivisions,
 - using Best Management Practices to mimic predevelopment hydrographs,
 - reduction of required road widths in subdivisions,
 - “decentralizing” subdivision stormwater management so that stormwater retention and groundwater recharge occur on individual lots to the maximum feasible extent,
 - “disconnecting” impervious surfaces; i.e., directing roof and driveway runoff to lawns or swales and not to driveways, streets and stormdrains,
 - use of bioretention cells and other Best Management Practices that emphasize plant uptake of pollutants and refiltration in addition to sediment removal and peak runoff,

- for commercial development, use of numerous swales, buffer strips and bioretention cells scattered throughout the property (especially within parking lots),
- requiring mitigation of current off-site stormwater problems at a two or three to one ratio for every cubic yard of runoff proposed for discharge to surface waters,
- requiring stormwater management in areas outside wetlands as stringent that those required under DEPs Stormwater Guidelines, and
- establishing dedicated fee-based revenue sources to support stormwater work;
- Retrofitting locations with poor stormwater management systems;
- Increased efforts to educate the public on the need to properly manage stormwater;
- Adoption and enforcement of bylaws requiring owners to clean up after their pets, and posting of “mutt mitts” in public parks.

See also “Innovative Strategies,” below.

Recommended Actions for Citizen Groups and Regional Alliances

- Collaborative efforts on creation of public education materials that can be “localized” by or for municipalities to meet their needs;
- Technical training for municipal boards, especially regarding the relationship of development to groundwater recharge and water supply;
- Demonstration (pilot) projects regarding optimal stormwater treatment methods;
- Drafting of model bylaws;
- Identification and prioritization of stormwater retrofit projects;
- Maximal use of available grant funds;

- Preparation of an analysis of the application of stormwater utilities to reduce stormwater management costs; and
- Public outreach on stormwater prevention, maintenance and repair.

Septic Management

Properly operating septic systems do a good job of protecting ground and surface waters from harmful pollution. They also are extremely efficient at recharging groundwater at a local level, as opposed to sewer systems that take water from the subwatersheds and discharge it directly (via MWRA and other sewers) into Boston Harbor or Massachusetts Bay. For these reasons, properly maintained septic systems or other decentralized approaches to wastewater treatment are the environmentally preferable method of sewage disposal. Regular pumping of septic systems costs less than half than MWRA sewer rates and decreases municipal water supply costs by helping to recharge groundwater.

Recommended Actions for State Government

- DEP should mandate regular tank pumpouts by septic owners;
- The state should increase aid to municipalities and citizen groups for the septic-related activities described directly below.

Recommended Actions for Municipalities and Citizen Groups

- Increase citizen awareness of the need to regularly pump out septic tanks;
- Develop a model database to be used by municipalities that links Board of Health data bases re/ individual pump-outs to “reminder letters” when another pump-out is due;
- Create by-laws requiring pump-outs of septic tanks every two years;
- Enforce more rigorously current septic hauler Title 5 annual licensing requirements to ensure they accurately report to

the Board of Health the condition of each septic system they pump;

- Increase local enforcement against owners of septic systems which are known to the Board of Health to be in need of repair or replacement;
- Establish a small fee on the water bills of septic users to cover the costs of basic education and enforcement activities; and
- Create municipal “septic utilities” (or at least a pilot project) to:
 - maximize regular pumping of all septic systems,
 - decrease septic pumping costs,
 - “insure” septic owners for the costs of major repairs and replacement,
 - increase municipal government awareness of septic system failures, and/or
 - establish a dedicated revenue source (grants or loans) for septic repair and replacement.

Management of Landscaped Areas

Stormwater runoff from lawns, etc. is a major cause of excessive nutrients from fertilizers, suspended solids, bacteria from animal wastes, and sedimentation. The issue is particularly serious for waterfront property owners, whose runoff goes directly into surface waters and whose land use practices (e.g., lack of a naturally vegetated strip of land along the shore) can be dramatically harmful to wildlife habitat both along as well as within streams and ponds. It is also an issue for other public and private landowners whose polluted runoff ends up in surface waters via stormdrains, road drainage ditches, etc.

Recommended Actions for Federal, State and Local Government

- Educate the public and take other actions (described below) to stop excessive and wasteful use of fertilizers and pesticides on

lawns, golf courses, and gardens. Do the same on government owned properties.

- Authorize the Massachusetts Soil Conservation Service to identify maximum permissible levels of fertilization for each municipality;
- Better education of state licensed pesticide professionals; greater enforcement when warranted;
- Educate waterfront property owners and take other actions (described below) to preserve or restore naturally vegetated buffer strips along waterways. Such buffers can consist of attractive, native ornamental plants that reduce runoff and bank erosion while protecting wildlife habitat and providing shade to reduce water temperatures;
- Use wetland and waterways regulations and local wetland bylaws to maximize retention of naturally vegetated buffer strips along waterways;
- Amend state wetland regulations or local bylaws to ban impervious surfaces, lawns, trails, or anything else that destroys a natural vegetated buffer directly adjacent to rivers, streams, ponds and vegetated wetlands;
- Abide by the sound land management practices for public lands; restore naturally vegetated buffers strips along banks on public lands;
- Promote environmentally sound alternatives to large lawns;
- Provide state and federal grant funds to restorative work and for ongoing public education programs on landscape management and restoration;
- Create local bylaws forbidding subdivision covenants that require ecologically unsound turf lawn maintenance practices;
- Create municipal zoning bylaws or other incentives which will limit environmentally damaging practices for new development; e.g.:
 - limit tree cutting and/or lawn sizes,

- prohibit construction site preparation prior to zoning board approval,
- limit removal of topsoil from properties under development.

Recommended Actions for Citizen Groups

- Identify bufferless riverfront areas for restoration and collaborate with government and landowners to protect and restore naturally vegetated areas;
- Educate homeowners (especially waterfront homeowners), golf courses, and lawn care companies on proper lawn and garden practices; organize lawn care courses for new homeowners;
- Give awards, certifications, or other recognition to lawn care businesses, golf courses, etc. that practice ecologically sound management of manicured landscapes.

Water Supply and Streamflows

The negative impacts of reduced instream flow include curtailment of recreational activities, increased concentration of bacterial and nutrient pollutants, increased risk of human exposure to contaminated river-bottom sediments, and a substantial reduction in the area and quality of aquatic habitats with resulting depletion of fish and other aquatic life. Causes of low instream flow include excessive use of water drawn from the watersheds, especially in summer months; interbasin transfer, especially via the MWRA sewer system; manipulation of water levels in impoundments; and, most importantly, poor stormwater management and sewer infiltration and inflow.

The Massachusetts DEP recently issued a Water Management Act Guidance with mandatory water conservation measures for communities in watersheds or subwatersheds designated as “stressed” by EOEA. Unfortunately, this watershed remains “unassessed” by EOEA.

Recommended Actions for Federal Government

- Development by USGS of a ground and surface water model for each watershed to aid in predicting watershed effects of

water withdrawals and other major water-related activities requiring a federal, state or local permit; and

- USGS should operate more stream gauges in the Watershed

Recommended Actions for State Government

- Do not limit stress assessments to stream gauge data where other stress indicators are evident;
- Annually audit water supply statistical reports and impose penalties for inaccuracies;
- Ensure that all relevant permitting decisions (insofar as permissible by statute) contribute to restoration of the natural watershed hydrology;
- Consider the cumulative effects on the basin of each new well proposal, including existing but unutilized withdrawal authorizations;
- Issue habitat-based, site-specific and seasonally adjusted stream flow thresholds (to replace Aquatic Base Flow targets);
- Provide technical assistance to public water suppliers regarding water supply conservation and mitigation techniques and watershed hydrology;
- Coordinate mutual municipal assistance in water emergencies to avoid excessive capital investments for individual towns, and
- Convene a dialogue with dam owners regarding the coordination of water release practices to ensure minimum daily summer flows, especially in times of drought.

Recommended Actions for Municipalities

- Assess culverts to determine if they are barriers to fish passage and/or appropriately sized for the stream;
- Adopt and enforce Irrigation System Performance Standards (including night watering of lawns);

- Voluntarily comply with DEP's water conservation requirements for highly stressed basins;
- Adopt bylaws allowing imposition of watering restrictions on private irrigation wells during periods of hydrological stress;
- Establish, and fund meaningful water conservation programs through variable water rates, including such activities as high flow toilet replacement through appliance rebates, provision of rain barrels for roof runoff, and elimination of discounts for select water users;
- Issue more frequent water billing so that consumers can better appreciate the cost of excessive summer water use.

Recommended Actions for Citizens and Regional Cooperatives

- Help educate public, landowners, and municipal boards;
- Assist in coordination of municipal water sharing and dam water management practices; and
- Advocate for adequate water conservation funding.

Boating Initiatives

Recommended Actions

- Encourage and promote boat pump out facilities;
- Give the U.S. Coast Guard the authority to enforce ballast water requirements;
- Ensure safe vessel maintenance practices at local marinas and boat yards.

Innovative Strategies: Financing

Many of the specific action items recommended in this Action Plan will without question require more funding to implement. Discussions during the preparation of this Plan turned again and again to the fact that

most of the problems outlined here are the result of inadequate funding, unreliable funding streams, and decades of deferred maintenance. Both federal and state funding have declined steadily in the face of inflation over the last few decades, and have fallen precipitously in the last few years. Government agencies at all levels and particularly municipalities will need financial help for these recommended actions to be implemented within a reasonable time.

Recommended Action for State and Federal Government

- Sewer maintenance and improvement should be treated as highway construction and maintenance are today, with a dedicated user fee-based funding source. Just as federal fees from the retail sale of gasoline are placed in a Trust Fund to pay for highway maintenance, dedicated water-related user fees should pay for the tremendous backlog of maintenance needed for wastewater infrastructure. For example, user fees could be placed on water-based products such as bottled water, soft drinks, etc.; and
- It is essential that funding and staffing at environmental agencies be restored to at least to Massachusetts Fiscal Year 2002 levels. More state and federal technical assistance as well as grant money is needed if municipalities are to fulfill their watershed responsibilities, many of which are mandated by federal and state government.

Recommended Action for Municipal Government

- Water and sewer user fees must be raised to adequately reflect the real costs of these services, especially the costs of addressing deferred sewer maintenance and the environmental costs of surface and ground water shortages;
- User fee based revenue streams must be created to provide consistent funding for municipal stormwater management and septic system maintenance responsibilities;
- Broaden the “conventional” view of water and sewer infrastructure. Traditionally sewer and water authorities view their roles purely in terms of “pumps and pipes,” ignoring larger questions of watershed management and maintaining their “watershed infrastructure.” In the coming century, where

water resources will be increasingly constrained, water and sewer authorities must view their roles more holistically; and

- To minimize fee increases, local governments should do much more on the “demand side” to reduce public water and sewer use (see the many action items on this subject, above, such as encouraging water conservation). In addition, local governments need to demand mitigation of water and sewer problems from developers who wish to avail themselves of these public services.

Innovative Strategies: Regional Collaboration

Recommended Actions

- Municipalities, with assistance from citizen groups, should take advantage of economies of scale by collaborating on things like:
 - water quality monitoring and testing,
 - public education (e.g., stormwater and water conservation),
 - pilot projects (e.g., development of a “septic utility”),
 - joint purchases of equipment and bidding for services (e.g., vacuum trucks, sewer leak detection equipment),
 - training of town boards (e.g., re/ NPDES Stormwater PhaseII),
 - development of model Bylaws,
 - development of model BMPS (e.g., for sewer pipe installation);
 - Improve state interagency coordination of state watershed-related activities (which has deteriorated badly since the abandonment of EOEAs watershed initiative);
 - Institutionalize communication and cooperation between towns, water suppliers and citizen groups in each watershed;

and

- Joint lobbying effort on state and especially federal funding by municipalities, citizens, nonprofits, and the private sector.

Innovative Strategies: Adapting to Local Conditions

Recommended Actions

- “Fine tune” materials produced collaboratively (see above) to reflect local conditions (municipal government and/or citizen groups);
- Identify the locations of the most pressing local problems (municipal governments and citizen groups); and
- Establish citizen/advocate committees for each town to strengthen the constituency for sound watershed management and make their voices heard (citizen groups).

See also the “Common Action Plan for All Boston Harbor South Watersheds,” above.

Back River Watershed Priority Action Items

The top four problems facing the Fore River Watershed are:

- Bacterial Pollution
- Excessive Nutrients
- Inadequate Stream Flows
- Lack of Recent Data on the Watershed

Bacteria and nutrients enter water bodies from failing septic systems, sanitary sewer overflow, untreated storm water runoff, and leachate from the Hingham and Weymouth Landfills. Suspected sources of bacterial pollution are illegal sewer connections and aging and deteriorating sewer infrastructure. The upper reaches of the Back River and Mill River have been identified by the state as having these pollution problems and do not meet water quality standards for their designated uses. There has been no pollution testing in the past five years in any of the other tributaries to the Back River.

The upper reaches of the Back River suffer from inadequate flushing (stream flow); however, there is little current information as to why. Whitman's Pond is undergoing eutrophication due to an overabundance of nutrients from residential and road runoff. Various efforts to decrease this threat are under way, but no definitive results are available. Water quality issues are exacerbated when the Pond is used as an emergency water supply by Weymouth, usually during the summer. Whitman's Pond provides major spawning habitat, which is negatively impacted by degraded water quality and changing water levels.

The Back River Watershed covers almost 12,000 acres and it is estimated that over 2,600 acres (22.5%) is impervious; of that, approximately

1,200 acres (10%) is residential lots of ½ acre or less. Studies of relationships between impervious cover and river health have shown that aquatic ecosystems start to degrade with only 10% impervious coverage. Impervious surfaces, such as roofs, driveways, sidewalks, and roads, increase untreated stormwater runoff and reduce water recharge and stream flows. There are the four active wells in Weymouth's Mill River Aquifer which supply 25% of the town's water. This river, along with another Back River tributary, the Old Swamp River, are critically in need of a TMDL.

Much of the data on the Weymouth Back River and its watershed used in the 2004 Back River Watershed Assessment has not been updated since the Back River Committee was disbanded in 1999. An urgent need exists for a concentrated effort by state and local government agencies and citizens groups to cooperate in getting more recent data. For example, there has not been a complete inventory of natural resources and land use for the entire river since 1982. The only natural resources and land use inventory that has been done since then was for the Back River ACEC in 1997 which covers only 1,000 acres in and around the estuary. Fortunately, since the river supports a very significant herring and smelt spawning run along with other anadromous and catadromous marine life, some attention and research have been given to this segment of the river.

Watershed Assessment

- Conduct much needed land use, natural resource and water quality assessments with the goal of developing TMDLs.

Water Supply

- Work with water supply systems to decrease water usage and encourage water conservation efforts:
 - Water saving plumbing fixtures, i.e. shower heads, faucets, toilets;
 - Decreased summer water usage;
 - Examination of innovative uses of wastewater (“gray water”) and stormwater; and
 - Limitations on the allowable amount of private well withdrawals near the river, its tributaries and aquifers.

Maintenance of Landscaped Areas

- Public education for landowners, homeowner and condominium associations, landscapers, developers etc in the watershed:
 - Encourage drought resistant landscaping;
 - Limit use of fertilizers/pesticides, including appropriate use and distribution; and
 - Make sure licensed pesticide professionals are aware of and comply with the responsibilities required under their licenses as issued by the DEP.

Innovative Strategies: Financing

Many of the specific action items recommended in this Action Plan will without question require more funding to implement. Discussions during the preparation of this Plan turned again and again to the fact that most of the problems outlined here are the result of inadequate funding, unreliable funding streams, and decades of deferred maintenance. Both federal and state funding have declined steadily in the face of inflation over the last few decades, and have fallen precipitously in the last few years. Government agencies at all levels and particularly municipalities will need financial help for these recommended actions to

be implemented within a reasonable time.

Recommended Action for State and Federal Government

Sewer maintenance and improvement should be treated as highway construction and maintenance are today, with a dedicated user fee-based funding source. Just as federal fees from the retail sale of gasoline are placed in a Trust Fund to pay for highway maintenance, dedicated water-related user fees should pay for the tremendous backlog of maintenance needed for wastewater infrastructure. For example, user fees could be placed on water-based products such as bottled water, soft drinks, etc.; and

- It is essential that funding and staffing at environmental agencies be restored to at least to Massachusetts Fiscal Year 2002 levels. More state and federal technical assistance as well as grant money is needed if municipalities are to fulfill their watershed responsibilities, many of which are mandated by federal and state government.

Recommended Action for Municipal Government

- Water and sewer user fees must be raised to adequately reflect the real costs of these services, especially the costs of addressing deferred sewer maintenance and the environmental costs of surface and ground water shortages;
- User fee based revenue streams must be created to provide consistent funding for municipal stormwater management and septic system maintenance responsibilities;
- Broaden the “conventional” view of water and sewer infrastructure. Traditionally sewer and water authorities view their roles purely in terms of “pumps and pipes,” ignoring larger questions of watershed management and maintaining their “watershed infrastructure.” In the coming century, where water resources will be increasingly constrained, water and sewer authorities must view their roles more holistically; and
- To minimize fee increases, local governments should do much more on the “demand side” to reduce public water and sewer use (see the many action items on this subject, above,

such as encouraging water conservation). In addition, local governments need to demand mitigation of water and sewer problems from developers who wish to avail themselves of these public services.

Innovative Strategies: Regional Collaboration

Recommended Actions

- Municipalities, with assistance from citizen groups, should take advantage of economies of scale by collaborating on things like:
 - water quality monitoring and testing,
 - public education (e.g., stormwater and water conservation),
 - pilot projects (e.g., development of a “septic utility”),
 - joint purchases of equipment and bidding for services (e.g., vacuum trucks, sewer leak detection equipment),
 - training of town boards (e.g., re/ NPDES Stormwater PhaseII),
 - development of model Bylaws,
 - development of model BMPS (e.g., for sewer pipe installation);
- Improve state interagency coordination of state watershed-related activities (which has deteriorated badly since the abandonment of EOEA’s watershed initiative);
- Institutionalize communication and cooperation between towns, water suppliers and citizen groups in each watershed; and
- Joint lobbying effort on state and especially federal funding by municipalities, citizens, nonprofits, and the private sector.

Innovative Strategies: Adapting to Local Conditions

Recommended Actions

- “Fine tune” materials produced collaboratively (see above) to reflect local conditions (municipal government and/or citizen groups);
- Identify the locations of the most pressing local problems (municipal governments and citizen groups); and
- Establish citizen/advocate committees for each town to strengthen the constituency for sound watershed management and make their voices heard (citizen groups).

See also “Common Action Plan for all Boston Harbor South Watersheds,” above.

Weir River Watershed Priority Action Items

The top four problems facing the Weir River Watershed are:

- Bacterial Pollution
- Excessive Nutrients
- Inadequate Stream Flows
- Hydromodifications (including dams, culverts, and channelization)

Bacteria and nutrients enter water bodies from failing/inappropriately maintained septic systems, untreated stormwater runoff from impervious surfaces, elimination of vegetated buffers along waterbodies, and waterfowl and pet wastes. The Weir River, the Weir River Estuary and Crooked Meadow each have been identified by the state as having these pollution problems and do not meet water quality standards for the designated uses of those waterbodies. There has been no testing for pollution in any of the other tributaries that feed the Weir River.

Inadequate stream flows stem from several problems. A report in 2000 commissioned by the State Department of Environmental Management indicates that river flow is stressed in large part due to water withdrawals in the watershed. A model of the water budget of the watershed indicates that 60% of the flow of the river has diminished since pre-development times. This problem is exacerbated in the summer months when water demand is high and water resources are naturally low due to less precipitation, leaving the river to suffer from low flows in the summer and in extreme drought conditions, no flow in sections. There is currently a proposal to bring on-line an existing emergency well to augment water supply in the watershed. This well is located near to the Weir River and may exacerbate the existing low flow problem. There has also been some

thought that this water could be exported to supply another watershed, again draining the Weir River Watershed of much needed water. In addition to water withdrawal, there is greater than 20% impervious cover of the watershed. Studies of relationships between impervious cover and river health have shown that aquatic ecosystems start to degrade with only 10% coverage of impervious surfaces. Impervious surfaces, such as roofs, sidewalks, driveways and roads, increase stormwater runoff and reduce water recharging the aquifer and baseflow.

All ponds along the Weir River are man-made and formed by damming of the river. Some ponds are used for water supply and some for recreation. If not properly managed, water flows during summer may be too low to allow for stream flow. Hydromodifications (including dams, culverts and channelization) alter other habitat features essential for fish and other aquatic life and prevent spawning by native anadromous fish. Two of the dams along the Weir River at Foundry Pond and Triphammer Pond do have fish ladders to allow fish passage. Despite these efforts, spawning fish populations have been declining, according to anecdotal evidence. Whether this is due to improperly functioning fish ladders, habitat modification, or pollution is unclear. Further studies should be conducted to identify if there is truly a decline in the numbers of spawning fish and, if so, what can be done to improve the situation.

Watershed Assessment

- Obtain state and/or federal funding to assess all portions of the watershed, particularly those portions listed as “unassessed” in DEP’s 1999 Water Quality Assessment Report.

Water Supply

- Work with water supply systems to decrease water usage, particularly lawn watering during daylight hours in summer months;
- Provide public education for landowners near waterways on the need to:
 - regularly pump septic tanks and replace failed systems,
 - maintain/restore buffer vegetation and other stormwater systems,
 - decrease water usage, particularly lawn watering during daylight hours in summer months,
 - clean up animal wastes,
 - use less fertilizers, and
 - prevent grass clippings and other organic matter from entering into streams;
- Work with municipal officials to adopt bylaws pertaining to the issues listed directly above; and
- Work with Town of Hingham and DEP to ensure minimum flow levels in streams;

Sewer Systems: System Extension and Capacity Expansion

- Limit use of sewer extensions that send Weir River water directly to Massachusetts Bay (preventing adequate recharge of Weir River groundwater); and
- Look for innovative strategies to “recycle” wastewater and stormwater back to the watershed to recharge river flow and aquifers.

Septic Systems

Establish “septic utilities” to provide regular, automatic pumping of septic tanks at a reduced cost to homeowners.

Riverine Habitat

- Mitigate damage to fisheries (especially anadromous fish) from hydromodifications and pollution;
- Work with town governments and developers to reduce impervious surfaces in new developments and/or provide better stormwater treatment; and
- Work with municipalities to establish rules requiring riverine restoration and/or mitigation for ongoing development and redevelopment projects.

Innovative Strategies

- Institutionalize means of communication between towns within watershed to address watershed related issues, including water supply, wastewater treatment and stormwater runoff. This “Watershed Council” could consist of appointed members from the communities within the watershed, the water suppliers and the watershed associations;
- Establish regional collaboratives among municipalities to take advantage of economies of scale on necessary activities such as water testing, storm water education, and water conservation programs; and

See also “Common Action Plan for all Boston Harbor South Watersheds,” above.



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