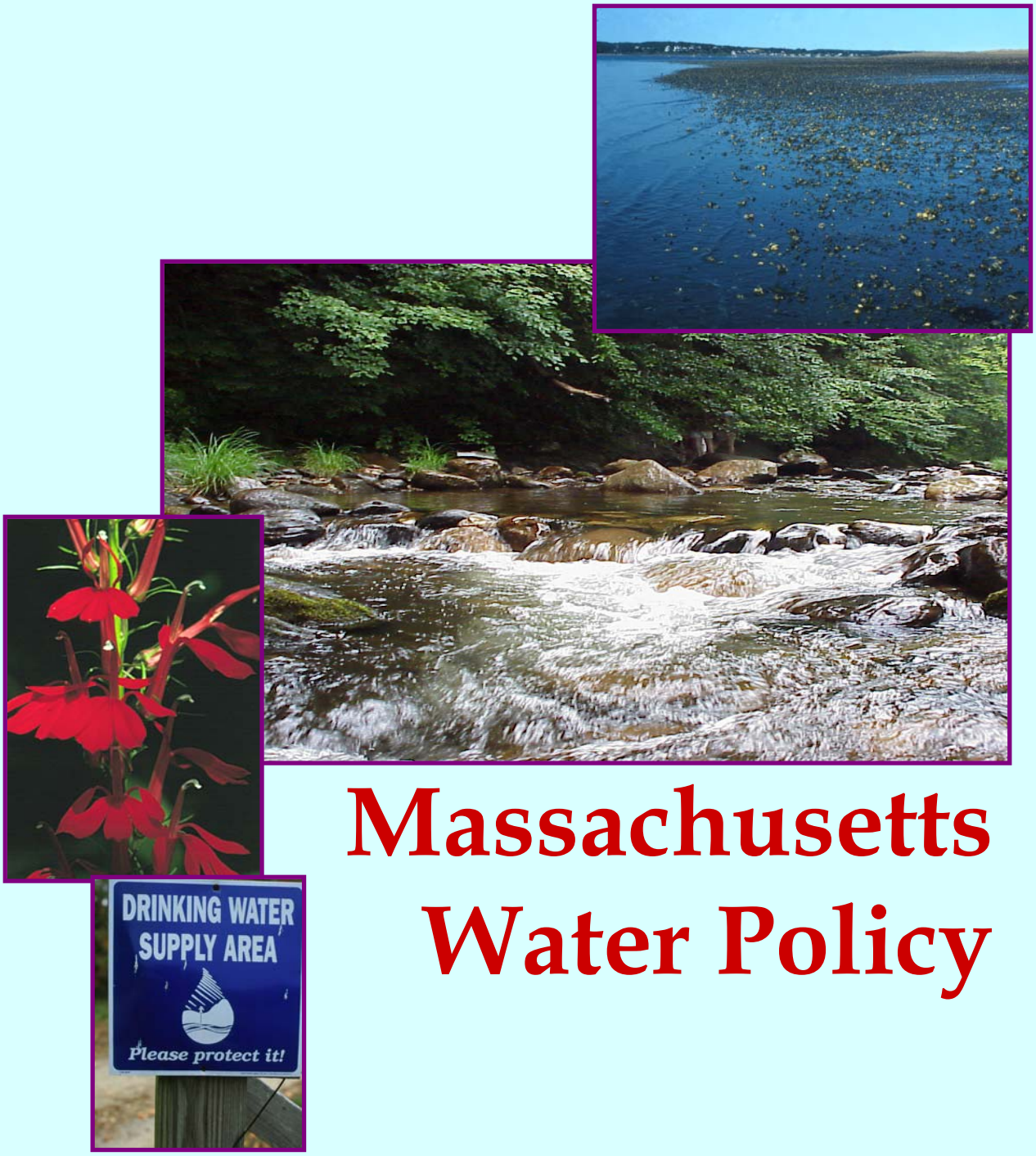

Massachusetts Water Policy

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Kerry Healey, Lieutenant Governor

Massachusetts Executive Office of Environmental Affairs
Ellen Roy Herzfelder, Secretary

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November 9, 2004

Dear Friend:

Governor Romney traveled across the state during much of 2002. He spoke a great deal about the many challenges that faced the Commonwealth in the new century and he pledged to reform and rebuild our state at every level. From fixing our state's aging infrastructure and reforming our regulatory and planning processes to determining the most effective and efficient way to protect and restore our critical natural resources—there was much work that needed to be done. To develop a new approach for managing our water resources and growing smarter about water conservation, I convened a Water Policy Task Force that brought the state's best minds to the same table to look at these issues and strategically plan for our future.

The recommendations in the water policy will create a more effective and more proactive working relationship between the state and its local and regional partners. This partnership will be an important component of my office's Smart Conservation strategy and will complement the Administration's Smart Growth strategy, as we work with localities to promote growth in a way that respects the wonderful resources with which this state has been blessed.

It will take time and a commitment of resources to complete the ten recommendations contained in this policy report. We look forward to the challenge.

Regards,

Ellen Roy Herzfelder

Ellen Roy Herzfelder

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Introduction

Massachusetts faces a number of significant water resource management challenges - water quantity, quality, and habitat. These challenges will only be exacerbated by new development unless the Commonwealth develops new approaches that promote effective management of its water resources and sustainable patterns of growth. To reach this goal the state needs to work in partnership with cities and towns, as they are vested with the responsibility of oversight over growth and either directly or through regional bodies manage important water resources. This policy seeks to move both the state and its partners to a proactive stance, by providing local and regional partners with greater clarity through wider use of performance standards and regulatory improvements, flexibility to manage their resources, technical assistance, better science, and incentives.

Challenges

One of the state's biggest challenges is maintaining sufficient quantities of streamflow so as to sustain ecological and anthropogenic demands. Massachusetts receives a significant amount of precipitation—the equivalent of 44 inches of rainfall per year—that fills our reservoirs and streams, and sustains our aquifers. In dry years, the amount of water remaining in our streams often becomes dangerously low. In the summer months, the thin, discontinuous aquifers of eastern and central Massachusetts and the limited aquifers (mainly fractures in bedrock) of western Massachusetts provide the only source of stream flow. The combination of high summer demand and low stream flows can adversely impact water availability and quality, vegetation and fish counts.

The impacts of insufficient water quantity behoove us to do our utmost to use water indoors and outdoors with maximum efficiency. Addressing quantity challenges requires the promotion of efficient water fixtures, conservation efforts, and new tools such as water offsets for new demands. Better use patterns will help minimize the need to develop new sources of water supply.

We also need to rethink where the water that we use goes. Existing infrastructure often transports precipitation away from where it lands instead of letting it infiltrate. Transporting dirty water far from its source made sense historically, but today, with significant improvements in wastewater treatment techniques and standards, treatment levels often make the water available for reuse or recharge, thereby replenishing the natural stream flows and aquifers in the basin or sub-basin.

An important subset of wastewater is stormwater—that is, precipitation that does not seep into the ground but runs off the surface. Traditional development patterns allow stormwater to travel across roads, parking lots, and other impervious surfaces into sewers and detention areas far away. Techniques to keep stormwater local and prevent it from becoming contaminated have been developed, including local infiltration via vegetative areas and rain gardens.

Finally, as regards quantity, we also need to make improvements to our aging and often leaky water supply, sewer, and stormwater infrastructure. Water supply infrastructure can leak water into the ground via cracks in the pipes that would otherwise send water to users. Leaking sewer infrastructure takes on ground water and conveys it to treatment plants resulting in increased treatment load and costs.

The Commonwealth also has impaired waters and debilitated aquatic habitat areas. Ensuring clean water requires that we do a better job of limiting point and non-point source pollution. Recent patterns of growth have introduced impacts due to runoff (e.g., changes in temperature and oxygen, suspended solids and bacteria), discontinuous critical habitat areas, and altered habitats. As a result, alarming changes in fish populations are evident in many of the Commonwealth's rivers, such as the Ipswich, the mainstem of the Charles, and the Housatonic Rivers. For example, the fish population in the stressed Ipswich River is composed of only 4 percent river fish (59 percent less than the expected level), while 93 percent of fish are more akin to pond fish.

The problems described above will only get worse if we continue to grow and manage water in the way we have over the last half-century. During the past 20 years, considerable land mass has been developed, rippling outward from Boston, even as total housing starts have not sufficed to meet the state's housing needs. Assuming growth continues on the basis of recent land use patterns, demand for water and the development of land critical to future drinking, recreational and habitat purposes will increase significantly. In addition, this will, over the long run, undermine the state's ability to ensure sufficient drinking water supplies for new growth and will overextend state resources.

The Charge

In early 2004, the Secretary of Environmental Affairs, Ellen Roy Herzfelder, convened a Water Policy Task Force to help craft a strong and forward-looking water resource management policy that more effectively complements and supports Governor Romney's Smart Growth agenda. Throughout this policy document is reflected the Governor's commitment to the coordination of development and environmental concerns, as manifest in the creation of the Office for Commonwealth Development (OCD) and Secretary Herzfelder's "Lean and Green" and "Smart Conservation" agendas.

Principles of the Water Policy

The Water Policy seeks to advance the following environmental principles:

- Keep water local and seek to have municipalities live within their water budgets by addressing issues from a watershed perspective
- Protect clean water and restore impaired waters
- Protect and restore fish and wildlife habitat
- Promote development strategies consistent with sustainable water resource management

Recognizing that current utilization patterns of the Commonwealth's water resources are frequently not sustainable, that the Commonwealth's economic growth and quality of life depend on a sustainable water

supply, and that we must create a more effective partnership with municipalities that are empowered with critical land use and development decision-making authority, the Water Policy Task Force sought in its work to:

Focus on the state's partnership with municipalities and regional water organizations
Be bold—not reckless
Emphasize desired results over process
Use the best available science to develop policies, priorities and specific action recommendations

Policy Context

The 2004 Water Policy sets out a blueprint that cuts across all aspects of water policy and builds upon aspects of prior policy-setting activities, such as the 1996 Water Supply Policy, the Interim Infiltration and Inflow Policy, the Wetlands and the Stormwater Policies and Guidances, the Water Management Act and Interbasin Transfer Acts. The policy supports the Federal Clean Water Act mandate that each state maintain, safeguard and restore the physical, chemical, and biological integrity of its waters underscoring the significance of natural hydrologic cycles, establishing a method for prioritizing watersheds in need of restoration, and integrating better science into resource management decisions.

In addition, the policy incorporates key elements of the Governor's Smart Growth agenda. Working with localities, it includes recommendations on planning and design innovations, fix-it-first strategies to encourage compact development and the revitalization of cities and towns, and proactive protection of future water supplies and critical water resources.

A New Working Relationship

It is with some urgency that the state seeks to establish a more effective working relationship with municipalities on water resource management and growth issues. The relationship will be one where the state provides the direction, planning, the tools, technical assistance, incentives, and finally a larger framework for municipalities and regional water departments to address the challenges described above. Municipalities and water departments, for their part, will need to adopt a more proactive stance and a longer-term vision to address these challenges.

In order to help communities put resources into the partnership, the policy identifies permitting issues of concern to municipalities. It seeks to make the costly, potentially exhaustive regulatory review and approval processes for New Source applications and new water withdrawal applications, among other issues, more predictable. The policy also addresses the need to give towns and regions greater flexibility in managing water sources, additional tools, and appropriate technical assistance.

Policy Recommendations

Addressing the Commonwealth's many water resource challenges will require that the state work more effectively with our municipal partners on a number of resource management fronts. The water policy recommendations include development and refinement of planning, tools and strategies to promote efficient use of water, measures to promote proper infrastructure maintenance, wastewater reuse and recharge, stormwater recharge, water supply development, resource protection and restoration strategies, and permit streamlining. The implementation plan included at the back of this document reflects the breadth of this work and ranges over four years.

Overall, the water policy recommendations on resource management move the state from a posture of reacting to problems to that of proactively working with local and regional partners to solve or avoid problems. Similarly, the recommendations complement the smart growth strategy of articulating and promoting more efficient local land use and more thoughtful designs rather than that of mitigating the negative impacts of development. Sustainable water use and effective pollution strategies (such as addressing non-point sources) will require more active pursuit of sustainable development practices - in essence, protection of critical resource areas, targeted resource restoration, higher-density growth, and more up-to-date designs and landscaping. These strategies will be important as areas of the state undergoing heavy development in the coming years have significant water resource, habitat, and dam issues.

RECOMMENDATION 1:

Create a "Stress Framework" with increasingly stringent performance standards, recommendations and requirements as a community's basin approaches highly stressed.

The Water Resource Commission (WRC) has identified communities situated in basins that are in stressed conditions. As a result, the state has been able to coordinate reactions to water resource crises in communities like in the Ipswich and the SuAsCo (Sudbury Assabet and Concord) basins. In order to encourage local and regional water entities to assume *proactive* water management policies (and avoid reaching the crisis point), the state needs to provide inducements to maintain lower levels of stress and clarity about the kinds of resource management tools that should be used within certain performance standard bandwidths. Functionally, the Stress Framework would provide a way for communities to understand the cost of allowing the shared basin to fall into a more stressed condition and, therefore, encourage proactive and, where appropriate, regional solutions.

The Stress Framework would set performance standards for the overall basin based on streamflow and, later, biological and chemical integrity. It would also identify performance standards for specific infrastructure and resource management issues, such as Infiltration-Inflow, Combined Sewer Overflows, and Target Fish populations, and establish a menu of targeted recommendations and requirements, including actions to

promote water efficiency and conservation, peak pricing strategies, infrastructure maintenance, planning, mitigation and water banking (both within a community and across communities).

In this way, the policy would seek to replicate a conservation approach and would make the Commonwealth more proactive in decreasing the level of stress across the State. The successful establishment of such a system, with increasingly stringent recommendations and requirements as a community approaches "high stress" conditions, would rely on a variety of actions related to sustainable water use and water management. To create such a system would require a consistent policy effort on the part of the WRC.

Actions

(a) The WRC should establish under its oversight a multi-stakeholder working group to expand the existing "stressed basin" into a tiered "stress level" framework

(b) Devise a graduated menu of actions related to specific performance standards including water efficiency and savings, seasonal peak pricing, the adoption of local wastewater treatment, water reuse and on-site stormwater and wastewater recharge, leak detection, metering, the adoption of technologies and products, the adoption of water enterprise accounts (and percentage of water rate payments going into the dedicated accounts), ratios of specific kinds of mitigation (water offsets), and establishing water banks

(c) Develop mitigation strategies and appropriate tiered ratios to encourage developers, water suppliers, and communities to take actions that "find water or get recharge" at a beneficial ratio and in the right place

(d) Revise the Water Conservation Standards to include measurable criteria for use in permitting decisions, grant awards and loans that can be incorporated into the Stress Framework. The Massachusetts WRC developed Water Conservation Standards for the state in 1992. Since that time new information on conservation has become available especially in the area of irrigation. In addition, the Interbasin Transfer Performance standards (1999) and the Water Management Act Policy of 2004 have illustrated the value of having measurable criteria for program implementation. Updating the Standards would allow for the incorporation of new information and new science, and provide the opportunity to make them more specific and measurable. In addition, the standards should be revised to include a tiered approach to conservation based on the level of stress in the watershed. (Related data requirements are outlined in Data A.)

(e) Develop a policy on maintenance and repair of leaking water supply and sewer system infrastructure, including requirements for adequate monitoring. The most successful tools for proper operation and maintenance of sewer systems, water supply systems and stormwater systems are maintenance plans based on good monitoring data and a dedicated source of revenue for implementing these plans. Specifically, the state should (a) refer communities to DEP's Operations and Maintenance

manual and monitor impact; (b) develop new or refine criteria for prioritization of infrastructure maintenance and repair (including percentages of leakage and steps to take), (c) encourage enterprise accounts (see Recommendation 3), and (d) incorporate standards for monitoring and repair frequency for all water conveying infrastructure to be used in developing local Operation and Maintenance plans.

RECOMMENDATION 2:

Develop clear guidance and planning materials to help communities meet existing and future water uses by developing watershed solutions based on water budgets.

Analyses should be undertaken to gain a more comprehensive understanding of local water budgets—that is, the inflow and outflow of water within communities—and those areas that currently and in the future will place pressure on water supply and wastewater capacities. The resulting water budgets will need to be incorporated into local and regional planning to ensure that growth and land use decisions are made with full knowledge of water supply and wastewater capacity implications. (Related data requirements are outlined in Data, Section A.)

More complete consideration of water resource management will be possible after the release of the Integrated Water Resource Management Plan (IWRMP) guidance currently under development in DEP. The IWRMP evaluates a wide range of water resource issues, such as existing and potential water supply needs, any interconnection with wastewater options, groundwater recharge, stream flow and water quality considerations.

Actions

(a) From a Water Budgets study, identify areas in Massachusetts where existing and future growth pressures can negatively impact riverine and estuarine ecosystems

(b) Provide guidance as to when specific "tools" (water banks, stormwater, reclaimed water, wastewater recharge, etc.) should be part of strategies to meet existing and future water supply demands or restore resources

(c) Identify critical areas where environmental and human needs may best be met by directing growth away from these areas, or by regional water systems where appropriate

(d) Finalize the IWRMP Guidance as soon as practicable and include wastewater, water supply, stormwater, and sustainable development principles that respect the natural hydrological cycle

RECOMMENDATION 3:

Pursue legislation requiring the use of enterprise accounts to fund operation and maintenance of infrastructure, stormwater mitigation and other water resource protection efforts.

Establishing a water-specific enterprise account allows a municipality to plan, operate and undertake infrastructure maintenance more effectively. The dedicated revenue account can also be useful in complementing state and federal funding or in addressing other needs, such as the protection of critical water resource areas and nonpoint source pollution.

Enterprise Accounts

The enterprise account in Concord (established in 1974) provides consistent quality service with long-range planning and accounting, and prevents sudden changes in rates in response to new capital projects. It has been used to acquire two groundwater well sites, and several parcels of property to protect groundwater resources and the watershed around their surface water supply, Nagog Pond. It has also been used to build two pumping stations and an ozonation facility for Nagog Pond, and for water main replacement.

Actions

(a) Promote enterprise accounts through incentives and, preferably, through legislation that goes beyond M.G.L. Chapter 44 Section 53 F ½ to require the establishment of water enterprise accounts. If legislation fails, incorporate a requirement in various permits, grant programs and loans for the establishment of an enterprise account. As part of the effort, promote the use of enterprise accounts to help fund maintenance and repair of leaking water and sewer system infrastructure, stormwater mitigation and select supply protection activities.

RECOMMENDATION 4:

Increase treated wastewater recharge and reuse.

Infiltration and recharge of water and treated wastewater into the ground will help replenish aquifers, enhance riverine base flows, and maintain healthy flow levels even in high demand summer months. In Massachusetts, treated wastewater has already been used, though less frequently than in some other states and parts of the world. The Commonwealth can safely put it to greater use, most cost effectively through on-site applications. Once the wastewater is treated and free of pathogens and contaminants, this nutrient rich medium can be used for crops, recreational areas and aquaculture. Treated wastewater can also be used to augment base flows by direct injection into the ground.

In addition, the state should also encourage appropriate recharge of stormwater. Such efforts can be applied to new developments as well as retrofitted in existing developments and subdivisions.

Actions

(a) Create a working group including DEP, the Office of Technical Assistance (OTA), MA Association of Boards of Health (BOH), and representatives of consultancies, municipalities, and commercial properties to review current treated wastewater disposal policies and practices and to recommend ways to augment reuse and recharge efforts. Specifically, the working group should encourage communities building new or expanding existing treatment plants, where feasible, to recharge treated wastewater into the ground; and commercial and industrial facilities to reuse their treated wastewater. The working group should make further recommendations after:

- Researching similar efforts in other states and how effectively different wastewater treatment technologies are at removing endocrine disrupters and pharmaceuticals
- Developing criteria to identify sites that are suitable for groundwater discharge and creating incentives to use these areas for recharge

Treated Wastewater Reuse

Gillette Stadium, Foxborough, reuses its treated wastewater for flushing its toilets. The stadium has an on-site wastewater treatment facility and a leach field capable of handling 200,000 gpd. In addition it has a 500,000 gal holding tank for reclaimed water that provides water for toilet flushing. The stadium expects to see a 50% savings in water use.

(b) Recommend that BOHs track and regulate septic system maintenance to extend septic system life and maintain proper performance. Furthermore, provide specific recommendations to guide BOH work after assessing the performance and feasibility of the SEPTRACK electronic data sharing effort in Buzzards Bay and the septic system management program in Gloucester

(c) Actively promote reclaimed water reuse at specific recreational and institutional venues and new large development sites

- Strongly encourage use of reclaimed water for ballparks, golf courses, and other recreational irrigation and state maintained properties, as well as for large-scale development projects through MEPA, DEP permitting, DCS Self-Help and Urban Self-Help grants, and relevant Department of Housing and Community Development (DHCD) grant programs
- Together with developers and environmental consultants, develop guidance documents for distribution to DHCD and through technical assistance

RECOMMENDATION 5:

Promote stormwater recharge close to its site of origin.

Stormwater is a source of water for many surface water bodies. Unfortunately, this same stormwater can also become a conduit for pollutants from parking lots and other impervious surfaces, to water bodies. The pollutants – everything from fertilizers to pesticides, salt, bacteria, nutrients, and metals - can cause severe water quality problems. Stormwater is one of the unfortunate by-products of development and increased impervious surface. As many of the larger subdivisions come through the Massachusetts Environmental

Low Impact Development

GeoSyntec Consultants working for Littleton, Massachusetts has undertaken the restoration of Long Lake, which has deteriorated due to stormwater. The watershed contributing to the lake has been retrofitted with Low Impact Development techniques such as rain gardens, vegetated swales, rain barrels, and a constructed wetland park.

Protection Act office (MEPA), and as many of the landscaping and design techniques are well known, MEPA would be a good venue for recommending the inclusion of appropriate design practices. The state should also ensure that existing requirements do not unduly discourage stormwater recharge and that authority exists for towns that want to develop local funding options, such as stormwater utilities.

One of the easiest ways to control the volume and concentration of pollutants in stormwater is at the source via natural vegetation. Vegetation can absorb and use excess water, impede the velocity of the flow, and through the root zone, trap and biodegrade many of the components in stormwater. Communities should be encouraged to reduce the amount of impervious surface in new development and to use LID techniques to control stormwater runoff and increase recharge.

Actions

(a) Provide guidance on appropriate Best Management Practices (BMPs) based on nature of contamination and impact, and have DEP finalize its current effort to update the Stormwater Guidance including an emphasis on increasing infiltration

(b) Extend the application of the Stormwater Guidance from wetland to upland areas and encourage stormwater recharge outside areas designated by Phase II of the National Pollution Discharge Elimination System (NPDES)

(c) Have MEPA highlight to project proponents opportunities to incorporate low impact development (LID) techniques for stormwater management

(d) Make recommendations as to the most effective way of promoting the establishment of stormwater utilities after investigating the Chicopee Stormwater Utility (see also Recommendation 3)

RECOMMENDATION 6:

Advance effective management of water supplies.

Decisions affecting the amount, location and type of growth in a community are made at the local level. To maintain sufficient flow levels in the watershed there is a need to outline a clear process for making supply development decisions that will give preference to those with minimal environmental impacts.

Clarity of direction and process from the state should be balanced by greater flexibility to municipalities to manage their supplies effectively. Specifically, water suppliers should have greater flexibility to develop redundant sources of water in order to take overburdened wells offline and undertake maintenance. (Redundant supplies will be developed within Water Management Act (WMA) permitted volumes and with appropriate DEP supervision in order to avoid excessive withdrawals, which can cause long-term environmental impairment if they occur during low streamflow periods.) Exercised properly, this flexibility will allow optimal resource management that matches the rate and timing of withdrawals to the natural storage capacity and flow of rivers.

Regional Water Treatment Plant

Braintree, Holbrook and Randolph are building a single regional facility in Braintree to supply water to the three towns. They are considering establishing a regional water agency that would increase efficiency, produce water at lower cost, and have an adequate supply for the high pressure summer months.

Actions

(a) Craft a state policy on water supply development in order to promote better long-term planning and provide clear information to local decision-makers regarding the development of new water supplies. Because decisions which affect the amount, location and type of growth a community undergoes are made at the local level, state actions must focus on setting a clear policy direction for preferred types of water supply development that cause the least environmental impact, including the requirement that all communities should meet all existing conservation standards before pursuing a new source to meet growth demands.

- Develop a policy on preferred methods of meeting water supply demands that establishes conservation as the first source, followed by recharge and reuse of water. The policy should also consider options that may have the smallest environmental impact, including surface reservoirs, regional supplies, flood skimming, desalination, and interbasin transfers

(b) Review current guidance and practices, and provide guidance for water suppliers on the optimization of sources so as to:

- Actively encourage the optimization of water withdrawals, by allowing multiple water supply sources without increasing withdrawal amounts so as to balance the rate and timing of withdrawals from multiple sources
- Have communities with rivers showing significant impact on stream flow from bank-side withdrawals strongly consider moving their sources
- Provide guidance on the placement of new wells where their use will reduce the overall impact to aquatic systems (including limits on the timing of pumping)

- Evaluate the benefits and costs of using publicly protected lands (municipal, state) for water supply and maintenance/optimization purposes
- Have DEP define plans for implementation and oversight, including supervision of source substitution by DEP regional offices, the maintenance of a database at DEP's central office, and monitoring of compliance in conjunction with IWRMPs

RECOMMENDATION 7:

Protect and restore critical land and water resources.

The earliest human impacts on Massachusetts' watersheds were caused by agricultural and industrial expansion, later by massive timber harvest, damming, and industrial or urban waste disposal, and most recently by sprawl development. As the pace of growth quickens on the North and South Shores, the Cape and central Massachusetts, the state needs to assume a more proactive stance on water resource protection and restoration.

Given the significant role they play in the management of water, local and regional water entities can provide expertise to the state's efforts to protect land supporting drinking water supplies. In many cases the priority lands to protect are obvious, such as municipal water supply lands; in other cases, determining which priority lands are worthy of protection requires a high level of analysis and coordination between the state and its partners. By incorporating the land protection program into Commonwealth Capital, the state can ensure that localities give due consideration to sustainable development opportunities and can maximize the state's ability to leverage new land use patterns.

Habitat Restoration

Hadley Falls, a rare habitat area on the Connecticut River has been deprived of streamflow in the summer months because of diversions. Using streamflow studies and identifying biological needs of key fish species, the Division of Fisheries and Wildlife was able to help restore minimum flows and critical fish habitat to this reach. The summer of 2004 witnessed a come-back of native fluvial fish.

Measures are also needed to identify and prioritize aquatic habitat areas. Changes in water quantity and quality can make rivers unsuitable habitat for fish - especially fish species that naturally occur in rivers. The state needs a clear, replicable methodology to identify rivers and streams in need of restoration and the steps that will attain restoration goals. Finally, aquatic habitat restoration and protection requires a variety of tools - enhanced local stewardship of lakes and ponds to protect them from cultural eutrophication, invasive species, and hydrological alteration, and facilitated lake restoration efforts. To leverage local, not-for-profit and private efforts, the state should disseminate for planning purposes the most up-to-date information on resource management, restoration and protection.

Actions

(a) Establish a grant program to protect water resources that:

- Prioritizes current and future unprotected municipal water supply lands, such as Zone I and Zone II land areas, aquifers lands, land abutting headwaters (primary order streams), and other riparian corridors
- Identifies acquisition projects that maintain natural filtration capability and can serve as recharge areas
- Leverages municipal / external resources and municipal actions to promote sustainable development by incorporating the program in Commonwealth Capital
- Provides extra points for biological integrity, i.e., for land referenced in *Living Waters* and *Bio Map*

(b) Protect and restore riverine and estuarine habitat by developing a methodology for prioritizing restoration projects

- Conduct target fish community assessments for mainstems and major tributaries as an indicator of environmental conditions
- Define appropriate fish community and habitat for small streams using Indices of Biological Integrity (IBI)
- Consider undertaking a geomorphic analysis to indicate target river structure (See Appendix A-2)
- Continue efforts to reduce local impediments to movement of fish, wildlife and other aquatic life requiring stream passage by maintaining the River Continuity project

(c) Disseminate information on resource management, restoration and protection, integrating *Living Waters* and *Biomap* into planning efforts and providing technical support on lakes and ponds issues

- Advance an education and outreach effort to landowners, local decision-makers, Conservation Commissions, developers, watershed associations, and stream teams about the importance of Core Habitats and Critical Supporting Watersheds and ways to protect them
- Incorporate *Living Waters* education into state programs that work with volunteers, such as Riverways RIFLS, Adopt-A-Stream and River Continuity

- Support the lake and pond technical review group recommended by the Citizen Advisory Committee for the Lake GEIR, currently convened by DCR, as a central point of reference to facilitate the review of lake management project proposals, dissemination of lake protection and management information, and to assess lake and pond management and restoration techniques and measures not evaluated in the GEIR
- Inform municipalities, private land conservation organizations, and private landowners of the need to protect the lakes and ponds and the tools available to protect them

RECOMMENDATION 8:

Promote sustainable development, timely maintenance of old infrastructure (Fix-It-Early), and the protection of priority water resources through refinements to the Clean Water (CW) and Drinking Water (DW) State Revolving Fund (SRF).

The CW and DW SRF's programmatic objectives are to promote public health, compliance and access to affordable water. Keeping those objectives in mind, the program's loan application can be refined to promote broader sustainable development and maintenance goals. Recognizing the significance of development that reduces non-point source pollution, the protection of parcels critical to supply, water quality, and wildlife habitat, and other state water policy goals, DEP is currently incorporating a greater consideration of sustainable development into the SRF criteria.

In addition, there are water resource management and fiscal reasons to focus on changes that will render municipal initiatives and the SRF program more effective in addressing crucial water infrastructure projects. Across the Commonwealth, water pipes and treatment plants are relatively old. In the coming decade, the many treatment plants constructed in the seventies will also require substantial updates and investments. Given the long list of communities applying for SRF loans, it is likely that many will not be able to undertake needed repairs. (Recommendation 3 identifies water enterprise accounts as a strategy that will extend the reach of SRF dollars, while Recommendation 1 calls for the development of a policy on infrastructure maintenance and repair.)

Actions

(a) Adjust the DW and CW SRF criteria to promote development in downtown areas, previously developed areas and "new growth centers," making sure to involve communities, the Environmental Protection Agency (EPA), the development community, and others

- OCD agencies, in collaboration with the Massachusetts Municipal Association, Regional Planning Agencies, and watershed associations, should provide technical assistance to ensure that the additional sustainable development criteria are not burdensome for communities within regional water authorities or without adequate planning resources.

(b) Encourage ongoing maintenance of existing wastewater and water infrastructure by giving preference or evaluation points to communities fixing old infrastructure priority in state grants and permits (over those seeking expansions), or using year-end slippage in the program (approximately $20 million) to fund exclusively Fix-It-Early projects

RECOMMENDATION 9:

Develop clear guidance and planning materials (including the "Growing Smarter Toolkit") to help municipalities, developers and consultants advance development that reduces negative impacts on the environment. Also, provide a single point of contact for technical assistance on permits requiring multiple agency review, environmentally-friendly development strategies, fast-tracking, and resource protection strategies within EOEA.

Communities develop differently and at different rates. Often communities barely have time to plan how to grow much less learn from other communities. Many new techniques have been developed across the country and in Massachusetts that are useful in planning for development in environmentally sensitive ways. Advancing sustainable development projects will require a cooperative approach that involves municipalities, developers, consultants, and the state, and, therefore, the development of clear guidance (the "Growing Smarter Toolkit," elements listed below) and incentives.

In addition, technical assistance and a coordinated permit process will enhance a proponent's ability to obtain appropriate permits in a timely manner and avoid costly and unnecessary delays. When environmental permits involve more than one agency, that coordination is best housed in EOEA, as EOEA can bring together the various agencies and harmonize their timelines. Technical assistance to promote the broader environmental agenda of sustainable growth is also best located in EOEA as the agenda involves regulatory, recreational, agricultural, and wildlife related issues, as well as issues related to other OCD agencies. Provision of technical assistance will be more effective if it is coordinated with various external partners.

Actions

(a) EOEA should develop information, outreach and relevant technical assistance strategies for municipalities, water suppliers, developers, and consultants as they relate to water issues and sustainable development. The "Growing Smarter Toolkit" should include but not be limited to outreach materials on:

- Water budgets, data, assessments, and monitoring efforts (the science) in watersheds
- State water policy documents, reports, permitting data, etc., in one portal
- Definition of Best Management Practices (BMPs)
- Case studies on *Pinehills* and developments undertaken in coordination with the Green Neighborhoods Alliance
- Stormwater by-laws that encourages reduction in storm-water runoff
- By-laws such as Open Space Residential Design (OSRD) and Open Space Mixed Use District (OSMUD), which preserve open space and natural resources by clustering development away from those resources

Smart Growth

Pinehills is a planned open-space mixed-use development in Plymouth, Massachusetts, which is an alternative to standard grid subdivisions. It serves as one example of cluster design based on preservation of natural features, reduction of impervious surfaces, water conservation, wastewater reuse, and historic preservation.

- Zoning ordinances which incorporates green building standards (LEEDs) for certain sizes and types of structures
- The adoption of LID techniques, especially in areas around wetlands and rivers
- Information packet for developers based on national LID brochure produced in cooperation with the National Home Builders Association

- Materials on non-acquisition strategies (model zoning, by-laws and ordinances, and various partnerships) available for municipalities to protect critical water resources, such as headwaters, Zone IIs, aquifers critical for source water and recharge, significant soils, slopes, riparian buffers, etc.
- Information on sustainable development and incentives available to developers (complementary grants to municipalities, fast-track "sustainable development" criteria, etc.)

(b) Seek legislative approval to expand the mission of OTA from that of providing technical assistance exclusively to businesses to include technical assistance to communities, developers and consultants

(c) Create a working group led by EOEA and including its agencies and interested parties to create a coordinated process for permits requiring multiple agency review, resulting in a single application, and concurrent, predictable timelines

- Set up pre-application framework to discuss feasibility and point out probable issues early - e.g., for significant municipal/regional projects, hold an initial meeting prior to MEPA submission that involves all permitting authorities and local interests so as to put all issues on the table
- Maintain current permit authority, but coordinate timelines and identify permitting, plan approval, and process redundancies so as to reduce duplicative processes and advance multi-agency coordination. Work to establish a consistent time period [e.g. 60 days] for interested parties to send in comments and concerns and providing communities the option of posting a pre-permitting notice in the Environmental Monitor
- Clarify regulatory roles of state and local players (e.g., of Conservation Commissions)
- Define interaction with pertinent non-EOEA agencies (the US Army Corps of Engineers, Mass Historical Commission, Mass Highway, etc.) regarding relevant project permits and impacts through such vehicles as memoranda of understanding (MOU)
- Develop model contracts for consultants to use with water suppliers
- Start with New Source Approvals but also address permitting bottlenecks as regards important environmental goals (e.g., dam removals)

Dam Restoration

Led by Riverways (DFG), partnerships between dam owners, non-profit conservation groups, corporate sponsors, state and federal agencies have resulted in breaching on the Old Berkshire Mill dam, the Billington Street Dam and the Silk Mill Dam. This has doubled the amount of high quality trout habitat, freed stream passage of alewives, and restored five miles of free-flowing habitat for Atlantic salmon and trout respectively.

(d) Assign OTA staff to act as Ombudsmen on permits requiring multiple agency review and coordinate permits for applicants and provide coordinated, consistent, and unbiased technical and regulatory assistance to municipalities from the pre-planning to permit stage

(e) Provide robust interaction and clear guidance to suppliers, localities, developers, and consultants on performance standards, permit information, policies, and reports generally, and on the Growing Smart Toolkit, Fast-Tracking, and non-acquisition land protection strategies. Include efforts to involve external partners such as watershed associations, regional planning agencies, consultancies and developers

RECOMMENDATION 10:

Take advantage of the new OCD structure to advance more effective planning with Mass Highways and other development agencies.

Improved coordination with other OCD agencies, within EOEA's own agencies, and with externals—whether municipalities and Conservation Commissions, other federal government partners, or non-profits—is crucial in order to ensure that we are taking advantage of new opportunities to protect and restore aquatic habitats, that we are maximizing the work we can get done with the dollars we have, and that we are in a systematic manner communicating about permit issues and regulatory changes within EOEA.

The quality and quantity of fish habitat can be markedly reduced when roads and rivers come together. This can be avoided in many instances if consideration of design improvements that could alleviate many impacts on riverways, fish and aquatic habitat were incorporated into construction and maintenance projects. As the state repairs its roads, as MassHighway and other agencies implement the Fix-It-First policy, and as new projects are undertaken in response to development pressures, particularly in the central and western part of the state, better design and maintenance guidance can be helpful in addressing environmental issues related to road/water crossings and habitat along highways.

At the thousands of locations streams and rivers within the Commonwealth are crossed by roads, artificial barriers such as (metal and some concrete) culverts and bridges. These, if designed incorrectly, create barriers to migration of fish (and wildlife), fragmenting fish habitat. Fragmentation of habitat leaves segmented populations ill equipped both physically and behaviorally to move through these structures, make them more vulnerable to external disturbances, reduces gene flow within the body of water, leaves important spawning and rearing habitat beyond the reach of migratory species, and may ultimately eliminate species that should be found in that particular body of water.

Actions

(a) Form a working group to draft a BMP guidance document for habitat lands next to roadways for existing strips of land between roads and nearby rivers to promote resource areas for shade, nutrient absorption and habitat value to rivers and streams, including:

- Prompt sand sweeping and recovery practices
- BMPs to control runoffs on existing roads
- Steps to control invasive plants along right-of-ways

(b) Enhance Division of Fisheries and Wildlife (DFW) coordination with MassHighway on road/water crossings to:

- Offset project costs and maximize the use of existing federal grant programs that support fish passage
- Develop crossing standards / guidance for project design and a GIS crossing database

(c) Work with MassHighway to involve the DFW early in the design of roadways where a road/water crossing occurs such that:

- DFW can review Transportation Improvement Project lists for fish and wildlife passage concerns and promote new structures, retrofits, and designs that meet Target Fish Community passage needs
- MHD avoids, where feasible, enlarging roads that share the flood plain with a river and increasing the length of armored riverbank
- MHD uses infiltration and retention structures to control road runoff and weighs relocation of roads away from rivers when the environmental impacts to the river and the costs of periodic maintenance to the roadbed make this a viable option

Finally, in order to improve coordination among its agencies and to promote implementation of this policy, EOEA will create an interagency group composed of key water staff. The interagency group will coordinate capital planning, data gathering, assessment and monitoring, information sharing related to regulation and permitting, and outreach to and collaboration with external partners, such as the WRC, watershed associations, municipal groups, universities, the USGS, and others.

Data

These new data gathering and assessment efforts will support the recommendations outlined above:

(a) Expand the current "Stress/ Flow" framework definitions developed by the WRC, establish "water budgets," and move gradually and systematically toward updating the standards to reflect and integrate the relationship between water quantity, quality and the protection of existing and designated uses. This policy suggests that the stress framework would meet communities' need for clear guidance on how to meet future water supply and wastewater needs while protecting and restoring water resources. The first step is to provide communities with a baseline of information on availability of resources, existing and future demands and environmental standards that need to be met on a community and watershed scale. By combining standards for streamflow and habitat protection with assessments of potential need and resources, the state can provide a clear picture in the form of a watershed budget that guides decisions at the state and local level. Informing decisions early on in the project proposal process ultimately leads to a more efficient and predictable permitting system. Quantifying the degree to which stressed areas are out of balance allows for projects to be adjusted or to go forward with mitigation.

Actions

i. Assemble the data that will provide the basis for greater considerations of flow in regulations (e.g., WMA) and approvals (e.g., IBTA)
ii. Complete the Water Asset Management (WAM) studies for the entire state
iii. Through the Streamflow Standards Task Force and the USGS cooperative program develop streamflow standards for each watershed (sub-basin)
iv. Build "water budgets" for watersheds from the WAM and streamflow standards
v. Refine the different stress levels in order to allow for incentives and triggers to be developed for planning and actions before basins become stressed
vi. Focus information dissemination and outreach efforts on providing information about natural stream flow to all players (water suppliers, municipalities, etc.)

(b) Gather data on target fish and fish communities and develop a methodology for using target fish as an indicator of environmental conditions and as targets for restoration. Fish communities are a reflection of the health of the entire ecosystem and can be monitored to evaluate and measure restoration progress and success. This recommendation describes a scientific process developed by DFG to analytically assess aquatic resources in the Commonwealth, identify those resources that are in the most need of restoration and conservation, and ultimately protect the biological integrity of fish, wildlife and aquatic resources at the watershed level.

Actions

i. Gather information from Conservation Commissions to update cold water resources
ii. Finish regional development of Target Fish Communities for mainstems of watersheds
iii. Conduct fish community and habitat analysis for small streams using IBI

Implementation of Recommendations

REC #	ACTION	RESPONSIBLE PARTY	PARTNERS
1	**Create a Stress Framework**	WRC (via Task Force or Subcommittees)	DCR, DEP, USGS, Watershed Associations
a	Define a Stress Framework that includes increasing efficiency of water use		
b	Define performance based mitigation strategies		
c	Revise and update Water Conservation Standards		
d	Develop policy on maintenance and repair of infrastructure		
2	**Help communities meet water needs via watershed solutions based on water budgets**	EOEA, WRC	DCR, DEP
a	From water budgets, study and identify areas where net losses of water could negatively impact ecosystems		
b	Use tools to meet existing and future supply demands		
c	Identify critical areas where water needs are best met by directing growth away or by regional water systems		
d	Finalize the Integrated Water Resources Management Plan (IWRMP) Guidance	DEP	
3	**Develop policy and pursue legislation requiring use of enterprise accounts for objectives such as infrastructure maintenance and improvements, stormwater mitigation, etc.**	EOEA	
4	**Increase treated wastewater recharge and reuse**		
a	Review current wastewater disposal policies and practices and recommend recharge and reuse; research efforts in other states; identify suitable sites for recharge; create incentives	WRC, DEP	Universities, DAR
b	Recommend Boards of Health track and regulate septic system maintenance	EOEA,	DPH
c	Actively promote reclaimed water reuse	WRC, DEP	
i	Encourage use in ballparks, golf courses, for recreational irrigation, state maintained properties, large scale development	DCS	
ii	Develop guidance for distribution to DHCD interacting with developers, consultants, municipalities		

REC #	ACTION	RESPONSIBLE PARTY	PARTNERS
5	**Promote stormwater recharge**		
a	Provide guidance on appropriate BMPs	DEP	LID Task Force, MMA, Watershed Associations, MACC, MHD, OCD, DAR
b	Extend current guidance from wetlands to upland areas and beyond Phase II areas	DEP	
c	MEPA recommend incorporation of LID techniques for all projects	MEPA	
d	Promote establishment of Stormwater Utilities	DEP	
6	**Advance effective water supply management**		
a	Create a state policy on water supply development	WRC	
b	Promote optimization of water withdrawals	EOEA	DEP, DCR, NEWWA/MWWA
7	**Protect and Restore critical land and water resources**		Watershed Associations
a	Establish a grant program to protect critical land and water resources	EOEA	
	Protect priority lands that protect water supply lands, Zone I, II etc.		
	Coordinate aquifer protection program with Commonwealth Capital		
b	Protect and Restore Riverine and Estuarine habitat		
	Develop methodology for prioritizing restoration	DFG	
	Target Fish Community assessments for mainstems and major tributaries		
	Define fish community and habitat for small streams using IBI		
	Determine target river structure		
	Continue River Continuity pilot project		
c	Disseminate information on restoration, protection; Protect habitats by implementing and integrating Living Waters and BioMap	DFG	
	Advance outreach and education and inform municipalities, landowners and organizations about tools to critical habitats		
	Incorporate Living Waters into State Programs		
	Support technical review group recommended by Citizen Advisory Committee for Lake GEIR		
	Advance an education and outreach effort to landowners and local decision makers-Conservation Commissions, planners, developers, WAs, stream teams	DFG, Vendor	

REC #	ACTION	RESPONSIBLE PARTY	PARTNERS
8	**Promote sustainable development & Fix-it-Early through CW and DW SRF loan programs**	EOEA, DEP	
a	Encourage ongoing maintenance of water and wastewater infrastructure		
b	Adjust applications to revise caps on new capacity in targeted areas and reduce extensions		
c	Provide technical assistance and do outreach to stakeholders via OCD and its agencies		OCD
d	Require adequate metering of wastewater between system and users		
e	Consider requiring enterprise accounts as part of SRF application		
9	**Provide guidance to help municipalities advance development with reduced negative impacts on the environment. Provide single point of contact for technical assistance on permitting, development strategies, fast tracking, resource protection**	EOEA	DAR
a	Develop informational packet and technical assistance for towns on:		
i	Stormwater and development		
ii	Non-acquisition protection strategies for water resources, model zoning, by-laws, ordinances		
iii	Redesign and distribute LID brochure	LID sub-committee	Homebuilders Association
iv	Develop certification program	RPA	APA
v	Water issues - budgets, data, assessment, monitoring; centralize all documents, reports, data	Ongoing	
vi	Sustainable development and smart growth - on OCD, EOEA, MEPA websites; online brochures for developers	OCD, EOEA	
b	Seek legislative approval to expand OTA mission	EOEA, OTA	
c	Assign staff to coordinate permits and provide technical and regulatory assistance from pre-planning to permit stage. Define pre-application process, coordinate public comment periods, develop consistent timelines for permits through a working group	EOEA	
i	Create working group through IWC to setup pre-application framework		

REC #	ACTION	RESPONSIBLE PARTY	PARTNERS
ii	Define interaction with pertinent non-EOEA agencies on permits		
iii	Coordinate timelines, identify permitting, plan approval, single EIR process redundancies, reduce duplication, *advance multi-agency coordination*		
iv	Improve New Source approval process		
d	Assign EOEA staff to act as Ombudsperson	EOEA	
e	Provide guidance on Growing Smart Toolkit, fast-tracking, non-acquisition land protection	EOEA, OTA	
10	**Advance effective planning with Mass Highways via OCD**	OCD, DOT, DFG	
a	Form working group to draft BMPs for habitat lands next to roadways	DFG	
b	Improve DFW coordination with MassHighways on road/water crossings		
c	Work with MH to involve DFW early in design of roadways near crossings, and abutting habitat lands		

DATA NEEDS			
a	**Expand Stress Framework definitions** Assemble flow data that can be used in regulations Complete water assets study Develop streamflow standards for each basin Build water budgets for each basin/sub basin Refine the different stress levels Do outreach and provide information on natural flows	WRC staff	
b	**Collect data on target fish communities and develop methodology for establishing restoration targets** Gather information from Conservation Commissions to update cold water resources Complete regional development of target fish data for key watersheds Conduct fish community and habitat analysis for small streams using IBI	DFG	

Implementation Schedule

No.	ACTION	PHASE I		PHASE II		PHASE III			
		Fiscal 05		Fiscal 06		Fiscal 07		Fiscal 08	
		Jan-05	Jul-05	Jan-06	Jul-06	Jan-07	Jul-07	Jan-08	Jul-08
1	Create a Stress Framework	WRC / DCR							
2	Meet water needs based on water budgets				WRC / DCR				
3	Use of enterprise accounts		EOEA						
4a	Increase treated wastewater recharge and reuse	WRC / DEP							
4b	Track septic system maintenance			EOEA					
4c	Promote reclaimed water reuse		WRC / DEP						
5a+b	Stormwater BMP guidance		DEP						
5c	Incorporation of LID into MEPA projects	MEPA							
5d	Establish stormwater utilities		EOEA						
6a	Policy on water supply development		WRC						
6b	Optimization of water withdrawals		DEP / DCR / NEWWA / MWWA						
7a	Grant program for critical land and water resources	EOEA							
7b	Methodology for restoration of habitat	DFG							
7c	Integrate *Living Waters* and *BioMap* into planning; lake and pond restoration		DFG						
8	Promote sustainable development and Fix-it-Early through CW and DW SRF	DEP							
9a	Develop technical assistance to towns	EOEA							
9b	Expand OTA mission	EOEA / OTA							
9c	Coordinate permits; provide regulatory assistance		EOEA / permitting agencies						
9d	EOEA staff act as Ombudsperson		EOEA						
9e	Growing Smarter Toolkit, fast tracking, etc. guidance	EOEA / OTA							
10	Planning with Mass Highways	OCD / DOT / DFG / MassHighways							
DATA									
a	Stress Framework	WRC / DCR							
b	Target fish and methodology for restoration targets	DFG / DFW							

APPENDIX A: For Future Consideration

RECOMMENDATION A-1:

Pilot watershed permitting

DEP should pilot a watershed permitting scheme that seeks to take into account the interrelationship of and the cumulative impacts of permits so as to coordinate water (WMA), stormwater (Stormwater Phase II) and wastewater (NPDES) permits throughout the watershed. Making use of lessons learned from the pilot, over the following year DEP should develop a process and regulatory changes in order to standardize "watershed permitting" on a wider basis.

The ideal situation for permitting decision would be one that is coordinated and takes into consideration the larger watershed perspective. Such a pilot should be undertaken in either an easy-to-manage watershed (with few issues and concerns) or in a watershed with a lot of data, such as the Ipswich River Watershed. In either case, the pilot could be undertaken together with a watershed association and a case study should follow drawing together "lessons learned".

Actions

- Determine data and measurements that are not currently in hand (ex., waste load allocation, etc.)
- Identify an appropriate watershed for the piloting of this effort. A discrete pilot in an easy to manage watershed should be explored, as it could provide lessons of interest across the stormwater, wastewater and water supply planes
- Interest a not-for-profit (university or environmental advocacy group) to study the pilot for environmental outcomes and workability (cost, staffing, time to permitting, etc. for agencies and for regulated parties)

Partners: DEP, DCR, non-government agencies, universities

RECOMMENDATION A-2:

Provide a quantifiable target river structure study to help prioritize restoration actions

The increasing intensity of development in Massachusetts has altered the natural flow regime and sediment load of many rivers, creating unstable river channels. These changes cause erosion and sediment pollution and result in the loss of aquatic habitat. To better understand the stream processes that govern river channel stability, and hence to provide a better target restoration in these reaches, a physical habitat assessment (geomorphic) of our rivers is needed. Results of this study will enable the Commonwealth, local municipalities and other proponents and decision-makers to apply quantifiable targets to restore impaired river corridors and essential habitat for aquatic communities.

Actions

- To describe the expected physical structure of stable rivers in each watershed in the state, determine regional curves of river channel hydraulic geometry
- Develop a target river habitat structure in each watershed using river cross-sectional surveys and habitat data from reference reaches
- Identify a flow regime and accompanying river structure that is achievable in both an urban and suburban setting. Establish stable habitat restoration targets over a range of watershed development levels

Partners: Riverways (lead), DFW, DEP, DCR, USGS, FEMA, US Fish and Wildlife Service, EPA, universities and nonprofit partners.

Appendix B: Glossary

Adopt-a-Stream: is one of the Riverways (DFG) programs that supports groups who want to "adopt" a river or stream by working to improve water quality and protect lands adjacent to rivers. http://www.mass.gov/dfwele/river/rivaas_toc.htm

Biomap: is an EOEA publication that guides land conservation for biodiversity in Massachusetts by identifying those areas most in need of protection. http://www.mass.gov/dfwele/dfw/nhesp/nhbiomap.htm

BMP: Best Management Practices

Commonwealth Capital: an effort across all OCD agencies to coordinate capital expenditures with the purpose of providing incentives to municipalities to promote high-density growth, limited traffic and environmental impacts, and the protection of open space and critical natural resources. http://www.mass.gov/ocd/comcap.html

Conservation Commission: Massachusetts Association of Conservation Commissions http://www.maccweb.org/

CZM: Massachusetts Office of Coastal Zone Management http://www.mass.gov/czm/czm.htm

DCR: Department of Conservation and Recreation http://www.mass.gov/dcr/

DEP: Department of Environmental Protection http://www.mass.gov/dep/dephome.htm

DFG: Department of Fish and Game http://www.mass.gov/dfwele/dpt_toc.htm

DPH: Department of Public Health http://www.mass.gov/dph/

FEMA: Federal Emergency Management Agency http://www.fema.gov/

GEIR: Generic Environmental Impact Report – The Practical Guide to Lake Management in Massachusetts http://www.mass.gov/dcr/waterSupply/lakepond/lakepond.htm

I / I: Infiltration and Inflow is extraneous water that enters the wastewater collection system through a variety of sources. It may either be groundwater that seeps into the infrastructure via cracks or joints (infiltration) or it can originate from a point source like stormwater runoff, drains, sump pumps, manhole covers (inflow), etc.

IBI: Index of Biological Integrity assesses the biological integrity of a habitat using samples of living organisms to evaluate the consequences of human actions on biological systems.

IWRMP: The Integrated Water Resources Management Plan evaluates current and future wastewater and water supply needs, assesses natural resource issues, identifies tradeoffs, and develops wastewater management alternatives to meet current and future needs. http://www.mass.gov/dep/brp/mf/files/fpintro.htm

LEED: The Leadership in Energy and Environmental Design (LEED) Green Building Rating System is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. http://www.usgbc.org/leed/leed_main.asp

LID: Low Impact Development is an approach to environmentally friendly land use planning. It includes a suite of landscaping and design techniques that attempt to maintain the natural, pre-developed ability of a site to manage rainfall. http://www.mass.gov/envir/lid/default.htm

Living Waters: is an EOEA publication that guides and promotes the strategic protection of freshwater biodiversity in Massachusetts. http://www.mass.gov/dfwele/dfw/nhesp/nhaqua.htm

MEPA: Massachusetts Environmental Policy Act is an agency of EOEA. http://www.mass.gov/envir/mepa/index.htm

MOU: Memorandum of Understanding

MRIP: Municipal Recycling Incentive Program http://www.mass.gov/dep/recycle/cities.htm

NPDES: National Pollution Discharge Elimination System http://www.mass.gov/dep/brp/npdes/surfabou.htm

OCD: Office of Commonwealth Development http://www.mass.gov/ocd/

OSMUD: Open Space Mixed Use Development

OSRD: Open Space Residential Design http://www.greenneighborhoods.org/site/Index.htm

OTA: Office of Technical Assistance http://www.mass.gov/ota/

Regional Planning Agencies: http://www.pvpc.org/marpa/html/marpa_index.html

RIFLS: River Instream Flow Stewards program at Riverways (DFG) helps local groups identify, document and restore rivers and streams suffering from abnormally low flows. http://www.mass.gov/dfwele/river/rifls/rifls_home.html

River Continuity: is a Riverways program at DFG aimed at reducing local impediments to movement of fish, wildlife and other aquatic life, which require instream passage. http://www.mass.gov/dfwele/river/rivercontinuity.htm

SEPTRACK: is a software package that enables each Board of Health to better track septic system permits, inspection and maintenance information in order to better protect public health and the environment. http://www.buzzardsbay.org/septrfct.htm

Stormwater Phase II: of the National Pollutant Discharge Elimination System (NPDES) program builds upon the existing Phase I program by requiring smaller communities, (i.e. MS4s- small municipal separate storm sewer systems) to be permitted for stormwater which is considered as a point source. http://www.epa.gov/region1/topics/water/stormwater.html

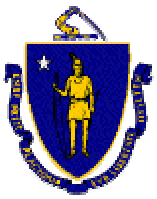
USGS: United States Geologic Survey http://www.usgs.gov/

WAM: Water Assets Management is an EOEA study that provides an assessment of current and potential water supply resources and current and projected water demands in the highest growth area of the Commonwealth, for proactive planning and protection of critical water supplies and essential ecosystem functions.

WMA: Water Management Act http://www.mass.gov/dep/brp/wtrm/aboutwtrm.htm

WRC: Water Resources Commission is responsible for developing, coordinating and overseeing the Commonwealth's water policy and planning activities. http://www.mass.gov/envir/mwrc/default.htm

Zone II: is a wellhead protection area that has been determined by hydrogeologic modeling and approved by DEP.



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