

REPORT OF THE WATER POLICY TASK FORCE

**Draft recommendations
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The Draft Water Policy contains recommendations developed by the Task Force appointed by Secretary Herzfelder, in April 2004.

Please provide your comments between July 02 and July 30.

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Thank you for your comments!

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WATER POLICY TASK FORCE

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INTRODUCTION

THE CHARGE

In early 2004, the Secretary of Environmental Affairs, Ellen Roy Herzfelder, convened the Water Policy Task Force to examine how water policy can more effectively complement and support the Governor's development and environmental agendas—increasing housing starts, job growth and the state's ability to attract new businesses, and crafting a strong and forward-looking environmental agenda, respectively. Governor Romney's commitment to coordinating the development and environmental agendas is manifest in the creation of the Office for Commonwealth Development (OCD) and Secretary Herzfelder's Lean and Green, and Smart Conservation agendas, which are reflected throughout this report.

PRINCIPLES OF THE WATER POLICY TASK FORCE

The Water Policy Task Group sought to advance the following environmental principles:

- Keep water local and seek to have municipalities living within their water budget by addressing issues from a watershed perspective;
- Protect clean water and restore impaired waters;
- Protect and restore fish and wildlife habitat; and
- 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 set itself the following five principles:

Focus on the state's partnership with municipalities and regional water organizations:

- Identify municipal actions the state would like to see (e.g., types of critical water resources to protect, water conservation strategies, zoning reforms, etc.);
- Identify state actions that municipalities would like to see (e.g., water permitting or policy changes that would enhance efforts to keep water local, etc.);
- Identify strategies for state collaboration with municipal and regional organizations (e.g., incentives, credits, fast-tracking, coordination, technical assistance, etc.); and
- Suggest alternatives not dependent on excessive state resources (e.g., ways to leverage outside Assessment/Monitoring efforts and maintain data collection standards).

Be bold—not reckless:

- Support innovation
- Create opportunities for private, municipal, and state pilots
- Derive lessons and innovations from other states

Emphasize desired results over process:

- Emphasize predictability (clear yes's and no's), timeliness, and cost-effectiveness in processes (application of the Secretary's Lean and Green agenda)

Given the limited timeframe, do not seek to create a comprehensive water policy

- Address a handful of issues and then identify longer-term efforts (working groups, process) to address problems requiring a more sustained effort (too small an impact, requiring long outreach, insufficient data, etc.)
- Focus on what is achievable and what will have the most impact
- Prioritize actions to be taken, (e.g., given short resources, assessment/monitoring of all water bodies is not a realistic goal or action to recommend) strategies, and timeframes for implementation

Use the best available science to develop policies, priorities and specific action recommendations.

- Identify additional (unique) mechanisms to fill in data gaps (e.g. from volunteer groups, stream teams, universities, watershed associations, etc.)

WATER RESOURCES AND POLICY CHALLENGES

As noted above, the Task Force worked to identify strategies that will help the Commonwealth and its communities better maintain water quality, quantity and the ecological health of watersheds, as the Administration advances its housing and development goals. The Task Force has, therefore, taken on a charge distinct from various other policy-setting activities, such as the 1996 Water Supply Policy, the Interim Infiltration and Inflow Policy, the Wetlands and the Stormwater Policies and Guidances. This Water Policy builds upon aspects of these policies and also the Water Management and Interbasin Transfer Acts. While not comprehensive, it sets out a blueprint that cuts across all aspects of water policy and, we believe, will establish a more effective working relationship between the state and its municipalities that will protect, manage and restore the Commonwealth's waters even as the state moves aggressively to meet its development goals.

The Water Policy recognizes that the Federal Clean Water Act mandates that each state maintain, safeguard and restore the physical, chemical, and biological integrity of its waters. To comply with these requirements, ongoing and new data collection and assessment, establishing a method for prioritizing watersheds in need of restoration, and integrating better science into resource management decisions is needed. In addition the Water Policy recommends methods to protect and restore the physical integrity of the state's waters by protecting and restoring connectivity, preventing habitat fragmentation and identifying the physical conditions including flow and river habitat structure necessary to sustain fish, wildlife, aquatic and other water-dependent organisms. Thus the Water Policy is a sound and sustainable one that respects the natural hydrologic cycle.

This policy also strives to meet and realize the Smart Growth agenda as set by the Governor. Smart Growth is the planning, design, revitalization and development of cities, towns, suburbs and rural areas to promote economic prosperity and enhance the quality of life through measures that respect the importance of freedom of choice, flexible land uses and the environment. Developing sustainable water-resources in the Commonwealth will require the balancing of multiple needs and demands, and a substantial commitment to sound science.

Background

Massachusetts receives an average of 45 inches of rainfall per year. Compared to some other states, we get a significant amount of precipitation. This precipitation serves to fill our reservoirs and streams and to sustain our aquifers. This rainfall that reaches our resources is highly influenced by natural seasonal and year-to-year climatic variations and human use of water. For example, in eastern and central Massachusetts, where growth pressures are the greatest, rivers and streams are commonly underlain by thin discontinuous aquifers. In western Massachusetts, ground-water resources are even more limited, and are typically limited to fractures in bedrock. Groundwater from these aquifers provides the only sustained source of streamflow in the summer months. Because many communities also rely upon ground water for public water supply, competition for water is greatest in the summer months when streamflows are lowest, public water supply demand the highest, and ecosystems need the cool temperatures of ground water to survive.

Challenges

One of our biggest challenges is the ability to use water efficiently, with the least amount of waste, for both indoor and outdoor uses. Making maximum use of the water that we currently abstract so as to avoid the necessity of looking for otherwise expensive new sources of water is our main focus. This can be achieved by increasing the efficiency of all water fixtures, increasing conservation efforts all across the

board, strongly encouraging water offsets for new demands, and overall creating new supplies of water via savings generated from current uses.

We need to rethink how we convey water from its source. We have designed our infrastructure to transport rainfall quickly away from where it lands on the ground, instead of letting it infiltrate. We transport our wastewater as far away as possible from our aquifers, thus preventing recharge. While transporting dirty water away made sense historically we now need to focus on how to keep water clean, and retain and restore it after use so it can be returned locally. Today, with significant improvements in wastewater treatment techniques and standards leading to a treatment level that has made the water potable, it makes little sense to discharge such large quantities of treated water so far away from its source. In the case of stormwater, there are many techniques to keep storm water local and prevent it from becoming contaminated. This can be achieved by infiltrating it locally via vegetative areas, instead of allowing it to convey across impervious surfaces into sewers and detention areas far away.

We also need to consider how our aging infrastructure unintentionally transports water. Aging sewer, storm water and water supply infrastructure leak water. Water supply infrastructure can leak water into the ground via cracks in the pipes that are supposed to be sending water to users. Leaking sewer infrastructure takes on ground water and conveys it to treatment plants resulting in increased load on the plant, increased treatment costs, and loss of ground water from aquifers. While many systems practice regular leak detection and repair there are many old systems in Massachusetts that have problems so large that fixing them becomes an overwhelming economic burden. Because of inefficient use, a history of piping water away from its source, and costly, aging infrastructure some of the Commonwealth is plagued by low river flow levels and impaired waters. As development increases outward from the Greater Boston area, more watersheds could face similar difficulties.

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. Past patterns of growth have introduced impacts such as changes in temperature and oxygen due to runoff, discontinuous critical habitat areas, and altered habitats. Restoration of these areas can be based on identifying the fish community that should be present in that river, specifically riverine fish as opposed to pond fish. For example, the fish community in the stressed Ipswich River is composed of only 4 percent river fish, 59 percent less than the expected, while 93 percent fish are more akin to pond fish. Similarly alarming changes in fish population are evident in the mainstem of the Charles River and the Housatonic River.

The problems described above will only get worse if we continue to grow and manage water in the way we have over the past half-century. Over the past 20 years, considerable land mass has been developed, rippling outward from Boston in a series of concentric rings: yet the growth has not, however, sufficed to meet the state's housing needs. Assuming build-out according to current local zoning, growth will mean both increases in the demand for water, and the development of land critical to future drinking, recreational and habitat purposes. A wise response would be to promote more compact and higher density growth centers, which leave critical water resource areas and habitat areas undeveloped; smarter residential and commercial, as well as highway, designs that incorporate strategies such as water conservation, wastewater recharge and re-use, and storm water recharge; and finally, the aggressive restoration of critical water resources.

Clearly, to do this work, we will need to address gaps in data, reviewing, and assessment. Unfortunately, many of the impacts to our rivers, lakes and marine areas are not documented or quantified and therefore it is difficult to develop solutions or mitigate problems. This is as true of assessment and monitoring activities, and data for infiltration and inflow as it is for fish and wildlife, physical habitat, the impacts of run-off, and other non-point source pollution.

A NEW WORKING RELATIONSHIP

It is, therefore, with some urgency that the state should act to establish a mechanism that will move the state and localities that are vested with the responsibility of overseeing growth, to a better working relationship. The relationship should be one where the state provides planning, the tools, technical assistance, incentives, and finally a larger framework (toolbox) for localities and regional water departments to address the challenges described above. Localities and water departments, for their part, would have to adopt a more proactive stance and a longer-term vision to address these challenges.

In order to help communities put the resources into the partnership, the Task Force has spent a significant amount of time identifying regulatory issues of concern to municipalities. We have sought to address the costly, potentially exhaustive regulatory review and approval processes for New Source applications and new water withdrawal applications, among other issues, and make them more predictable. The Task Force also addressed the need to give towns and regions greater flexibility in managing water sources. Communities genuinely interested in managing their existing water supplies and resources should be given additional tools and the right technical assistance to do so.

I. THE TOOLBOX

RECOMMENDATION 1: Create a toolbox based on the Stress Framework and water offsets, with increasingly stringent recommendations and requirements as a community approaches “stressed” conditions. This will move local and regional water entities to a more proactive posture and also provide guidance as to when certain tools should be used.

Incentives are useful in stimulating particular actions, and in the short-term they are a constructive step forward. A larger framework -a toolbox that makes clear where each of the tools fits in -is needed. The organizational framework discussed by the Task Force is what we call the “Stress Framework.” It is a fusion and systematizing of two currently employed elements of water policy -the “stressed” basin concept, which was developed by the Water Resources Commission, and water offsets which are being used by the Department of Environmental Protection (DEP).

The Stress Framework offers a wide range of factors for water efficiency and savings (including pricing options, for example) and systematizes the ratios of mitigation on the basis of three categories of stress levels—adequate condition, near-stressed, and stressed basins. In this way, the policy would seek to replicate a conservation approach and a pricing mechanism and would seek to make the Commonwealth more proactive. The successful establishment of such a system, with increasingly stringent recommendations and requirements as a community approaches “stressed” conditions, would rely on a variety of actions related to sustainable water use and water management. To create such a system would require a sustained policy effort on the part of the Water Resources Commission.

In order to ensure that basins that are not stressed or near-stressed can grow without having adverse impacts on the flow condition of the rivers and streams in the watershed, and in order to encourage municipalities to be pro-active in establishing water resource management strategies, the state needs to work together with localities to establish a clear, effective, fair manner for mitigating the impacts of growth and undertaking water management actions. DEP is currently overseeing the use of water banking in the Town of Weymouth, where the arrangement was established as part of an agreement with DEP to organize mitigation within the overly stressed basin. Water offsets should be required for any community that is nearing its water supply or wastewater system capacity. Many requests to the community for system expansion can be handled through savings achieved by water conservation or infrastructure repair. Programs in the Towns of Weymouth, Hanson, Stoughton, and Brockton should be evaluated as models for this program.

The water “banking” underway in Weymouth and other places is akin to the barter system, where offset ratios are established, and mitigation actions are undertaken on a case-by-case basis. The Water Offsets strategy could be incorporated into permitting decision-making. These offsets can also be implemented by community or regionally. Developers/water suppliers with proposals in water-short communities can be required to or receive preferential (fiscal or permitting) treatment if they identify water conservation opportunities or advance recharge by matching new gallons of withdrawal to “finding” new gallons through techniques such as infiltration and inflow repair, keeping wastewater local, and storm water recharge. Offsets must be designed for conditions in specific watersheds.

A more “liquid” version of the water banking/offset idea is that mitigation payments could take the place of specific actions in such a way that towns and cities could use the money to address leaks and other infrastructure issues. To accomplish this, towns would have to establish enterprise accounts that would enable them to create dedicated trusts for water-related projects only. Finally, a third step is to move

toward a truer inter-municipal water banking system, which would entail exchanges between water-rich and water-poor communities.

Specific Actions

- Define mitigation strategies and appropriate ratios to encourage developers and water suppliers in water-short communities to take actions (metering for leak detection, household metering, outreach on technologies/products such as low-flow toilets, I/I removal, protection of headwaters and other critical land, planning, etc.) that “find water or get recharge” at a beneficial ratio and in the right place
- Define and coordinate additional stimuli to encourage municipalities to be more proactive in addressing water management issues, such as peak pricing, local wastewater treatment, water reuse and on-site stormwater recharge, leak detection, metering, and incentives for technologies and products
- Ensure that our rivers and streams maintain healthy seasonal flows necessary to protect the ecological integrity of the stream by recommending consistent watershed-wide drought management plans and strong peak summer use controls
- Ensure that mitigation ratios take into consideration impact, longevity, etc.
- Set the ratios to be increasingly stringent as municipalities approach near-stressed and stressed categories

Timeframe: 1 – 1.5 years

II. PROMOTE PROACTIVE WATER RESOURCE MANAGEMENT

At the broadest level, the Water Policy Task Force’s recommendation regarding the state’s water resource management policy is that, the challenges raised by new development, old infrastructure, and water use patterns require that we work more effectively with our municipal partners. The Task Force suggests the development and refinement of planning, tools and strategies to promote efficient use of water, wastewater reuse and recharge, stormwater recharge, and water supply and system management. The Water Policy recommends that the state promote sustainable stewardship of water resources. The following five recommendations represent an ambitious agenda that will need to be undertaken by both the state and local partners over a period of years.

RECOMMENDATION 2: Develop clear guidance and planning materials to help communities on how to meet existing and future water uses by developing watershed solutions based on water budgets.

A water budgets study should result in identification and an understanding of which areas place existing or future growth pressures on water supply capacity, wastewater capacity and the environment. These areas will need creative solutions to achieve a healthy environment while addressing the growth pressures on water supply and wastewater capacity.

Specific actions

- From a Water Budgets study, identify areas in Massachusetts where existing and future growth pressures can negatively impact riverine ecosystems
- Use “tools” (water banks, stormwater, greywater, wastewater recharge, etc.) as part of the strategy to meet existing and future water supply demands and restore resources
- Identify critical areas, such as headwater streams, where environmental and human needs may best be met by directing growth away from these areas, or by regional water systems where appropriate

Timeframe:

In addition, DEP currently is finalizing the Integrated Water Resources Management Plans (IWRMP). The IWRMP can play a significant role in promoting comprehensive consideration of water resources management. An IWRMP 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. It helps communities determine and understand existing and potential threats to their water resources. The plan identifies and is sensitive to environmental resources, water supply needs and their interconnection with wastewater choices. And finally, it demonstrates an understanding of groundwater recharge, streamflow and water quality considerations. The Task Force urges that the IWRMP be finalized as soon as practicable and that it include wastewater, water supply, stormwater, and sustainable development principles that respect the natural hydrological cycle.

RECOMMENDATION 3: Advance the efficient use of water by: (a) revising the Water Conservation Standards to include measurable criteria; (b) developing a seasonal peak pricing strategy; (c) pursuing legislation that requires local enterprise accounts to fund operation and maintenance of infrastructure; and (d) crafting a policy on maintenance and repair of leaking water supply and sewer system infrastructure.

(a) Revise the Water Conservation Standards to include measurable criteria for use in permitting decisions, grant awards and loans. The Massachusetts Water Resource Commission (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 could be revised to include a tiered approach to conservation based on the level of stress in the project area and the type of project.

Specific Actions

Under the oversight of the Water Resources Commission convene a multi stakeholder taskforce to review the existing standards and to the extent possible:

- Develop new standards that includes new information, such as the Guide to Lawn and Landscape Conservation, 2002
- Convert standards to measurable criteria or performance standards that have a tiered structure based on the degree of environmental stress or the type of project
- Hold all regulated water suppliers, whether public or private, to the same efficiency standards
- Assemble model by-laws for communities to use in meeting the standards

Timeframe: 6 months

(b) Develop a seasonal peak pricing strategy. Individuals respond to price signals, which are generally determined by oscillations in supply and demand. The problem in setting prices for water is that a true expression of supply is hard to determine because, in most cases, prices established by water system operators do not reflect overall watershed conditions or the full cost of water supply development, water transport and recharge, maintenance and replacement, and associated environmental costs. Establishing a seasonal peak pricing mechanism that varies according to the relevant Stress Framework category will go a long way to persuading municipalities to give due consideration to underlying flow and other conditions at the sub-basin and basin level and to keep up their water infrastructure.

Specific Actions

- Form a working group under the auspices of the WRC to develop a peak pricing strategy based on the Stress Framework

Timeframe: 6 months

(c) Craft a policy on maintenance and repair of leaking water supply and sewer system infrastructure, including requirements for adequate monitoring. Aging water supply and wastewater infrastructure can be a financial and management challenge especially in older cities that often have the largest systems. Leaky infrastructure can have significant impacts on the environment and the public. These systems can unintentionally transfer water out of a basin through leaks or worse discharge undiluted sewage to rivers, streams and basements. The most successful tools for proper operation and maintenance of sewer systems, water supply systems and storm water systems are maintenance plans based on good monitoring data and a dedicated source of revenue for implementing these plans. (See “Enterprise Accounts” below and Recommendation 12 for incentives to communities (Recommendation 12 is not relevant incentives to cap leaky infrastructure), and 17(b) for related data and assessment needs)

Specific Actions

- Develop criteria for prioritization of infrastructure maintenance and repair (including percentages of leakage and steps to take)
- Encourage enterprise accounts (below)
- Incorporate standards for monitoring and repair frequency for all water conveying infrastructure to be used in developing local Operation and Maintenance plans

Timeframe: 6 months

(d) Pursue legislation requiring the use of enterprise accounts to fund operation and maintenance of infrastructure. From the perspective of municipal officials funding repair is difficult to measure against other more visible needs many communities have, such as the need for better schools and adequate fire and police protection, unless there is a public health threat. Even then the concern is relegated to one part of the community and may not be felt by everyone. The use of an enterprise account to implement the operation and maintenance plan allows for an uninterrupted improvement of the system that is not subject to political will.

Specific Actions

- Develop and adopt a policy requiring the use of enterprise accounts by municipalities to fully fund the maintenance and repair of leaking water supply and sewer system infrastructure as well as water supply protection activities
- Pursue legislation requiring the use of enterprise accounts
- (If legislation fails,) incorporate a requirement in various permits, grant programs and loans for the establishment of an enterprise account

Timeframe: 3-9 months

The state would like to take strong measures to infiltrate and recharge water and treated wastewater into the ground to the maximum extent possible so as to enhance base flows of our rivers and thus maintain a healthy flow of water especially in the high demand summer months. The state would also like to encourage reuse of greywater and recharge of stormwater and treated wastewater. Stressed basins, are especially good candidates for this effort. This effort can be applied to new developments as well as retrofitted in existing developments and subdivisions. As regards wastewater recharge and reuse and stormwater recharge, the Task Force arrived at two recommendations:

RECOMMENDATION 4: Increase treated wastewater recharge and reuse.

Movement of wastewater from the area of origin to wastewater treatment facilities and finally to discharge areas is the leading cause for water deficits in many of our river basins. Keeping water and

wastewater local is one of the main focus areas of this water policy. Wastewater accounts for a large percentage of the water that is lost from a basin; water that could replenish groundwater, rivers, lakes, ponds and wetlands, as well as be used for specific human needs. In areas that are located in stressed basins, the wastewater can be put to valuable use. Once the wastewater is treated and free of pathogens and contaminants, this nutrient rich medium can be used for crops, golf courses, aquaculture, etc. Because of the high nutrient content of the water, crop yields using treated wastewater is higher compared to using regular potable freshwater. Currently treated wastewater is being used in many other states, (e.g., California, Arizona, Florida) and around the world (e.g., Mexico, Mediterranean region, the Caribbean, Peru, India, etc.). The treated wastewater can also be used to augment base flows by direct injection and recharge into the ground.

Specific Actions

- Create a working group including DEP, the Office of Technical Assistance (OTA), MA Association of Boards of Health, and representatives of consultancies, municipalities and commercial property representatives to review current treated wastewater disposal policies and practices and to recommend ways to augment recharge and reuse efforts—and specifically to encourage communities building new or expanding existing treatment plants to recharge treated wastewater into the ground, and commercial and industrial facilities to reuse their treated wastewater
- Recommend Boards of Health track and regulate septic system maintenance to extend septic system life and maintain proper performance: (a) consider the SEPTRAC electronic data sharing effort in Buzzards Bay, and the septic system management program in Gloucester; (b) seek septic pumping every 3 to 5 years
- Research similar efforts in other states across the country
- Develop criteria to identify sites that are suitable for groundwater discharge and create incentives to use these areas for recharge
- Research how different wastewater treatment technologies are at removing endocrine disrupters and pharmaceuticals

Timeframe:

RECOMMENDATION 5: Promote stormwater recharge close to its site of origin.

Precipitation that does not seep into the ground but runs off the surface is defined as stormwater and is a source of water for many surface water bodies. Unfortunately, this same stormwater can also become a conduit for pollutants from parking lots, other impervious surfaces, to water bodies. The pollutants can be fertilizers, pesticides, salt, bacteria, nutrients, metals, etc., thus causing severe water quality problems. Significant impervious surface (mainly asphalted areas) is constructed with traditional subdivision developments. As many of the larger subdivisions come through the Massachusetts Environmental Protection Act office (MEPA), and as many of the landscaping and design techniques are well known, MEPA might be a good venue for recommending the inclusion of appropriate design ideas. 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. (See Recommendation 7)

Specific actions

- Extend the current guidance from wetland areas to the entire state
- Encourage stormwater recharge outside of National Pollution Discharge Elimination System (NPDES) Phase II designated areas
- Have MEPA make a recommendation to all appropriate project proponents that they incorporate low impact development (LID) techniques for storm water management.

- Enable establishment of stormwater utilities; investigate the Chicopee Stormwater Utility created through a 319 grant

Timeframe: 6 months

RECOMMENDATION 6: Advance effective water supply management by: (a) crafting a state policy on water supply development; and (b) actively promoting the optimization of water withdrawals.

(a) Craft a state policy on water supply development that can be incorporated into the Stress Framework 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.

Specific actions

Formalize a policy on preferred methods of meeting water supply demands that establishes

- Conservation as the first source
- A second tier where the community develops sustainable water supplies by re-using the water to the extent possible and discharging it locally; e.g., Intel in Hudson which re-uses water and discharges on site and also manages storm water; or Gillette Stadium in Foxboro which uses grey water for toilet flushing
- A third tier of areas with limited water resources, such as basin headwaters, where the community expands existing reservoirs, seeks regional supplies, employs flood skimming, identifies or creates reservoirs, or pursues desalination
- A fourth tier of other areas that pursue deep bedrock and aquifer wells and, finally,
- Interbasin Transfer (IBTA) as the last source of water supply after due consideration of impacts to the donor and receiving basin

Timeframe:

(b) Actively promote and encourage the optimization of water withdrawals, by allowing multiple water supply sources without increasing withdrawal amounts so as to optimize the rate and timing of withdrawals from multiple sources. The development of additional sources so as to gain water supply redundancy will allow water suppliers, with appropriate supervision, resource management flexibility that can reduce the impact on wells located in environmentally sensitive areas. With increased flexibility and control over sources, water suppliers can take overburdened wells offline, enhance maintenance, thereby avoiding over withdrawals especially during low streamflow conditions that may cause environmental impairment. If such flexibility is exercised properly, it will allow for resource management optimization—or matching the rate and timing of withdrawals to the natural storage capacity and natural flow of the river.

Specific actions

- Provide guidance to advise water suppliers on the optimization of sources: (a) review current guidance and practices; (b) have communities with rivers showing significant impact on stream flow from bank-side withdrawals strongly consider moving their sources; (c) define appropriate actions that help determine the placement of new wells where their use will reduce the overall impact to aquatic systems (this can include limits on the timing of pumping); (d) evaluate the benefits and costs of using public protected lands (municipal, state) for water supply sources and for maintenance/optimization purposes; (e) determine when fast tracking of additional sources is

appropriate (i.e. when conservation standards are met, etc.); and (f) explore existing regional authorities to determine effectiveness

- Have DEP define plans for implementation and oversight, including; (a) oversight of source substitution by DEP Regional offices; (b) maintenance of a database at DEP's central office; and (c) monitoring of compliance in conjunction with Integrated Water Resource Management Plans (IWRMPs)

Partners: WRC, DEP, MWWA, NEWWA, MEPA

Timeframe: 9-12 months

Again, in order to build an effective partnership with localities on water resource management issues, the state needs to do its utmost to ensure both sustainable environmental outcomes and predictability and timely decision-making at the state level. The Task Force spent significant time discussing ways to accomplish this on New Source Approval and other permits. Please see Section IV: Technical Assistance and Coordination.

III. PROMOTE A PARTNERSHIP WITH MUNICIPALITIES TO GROW SMARTER, and PROTECT AND RESTORE THE ECOLOGICAL ENVIRONMENT

The Commonwealth's built environment -particularly its areas of old water infrastructure and the growth pattern of the last half century- will prove a challenge to the state's water resource management policy. But no matter how effective the state and its local partners are in implementing the above recommendations, success will elude us if we are unable to grow smarter as we contemplate environments we are yet to build. Sustainable water use and effective pollution strategies (such as addressing non-point sources) require more active pursuit of sustainable development practices -in essence, higher-density growth, more up-to-date designs and landscaping, protection of critical resource areas, and targeted resource restoration.

The Water Policy Task Force's recommendation regarding resource protection and restoration is that the state should move from a stance of trying to mitigate the negative impacts of development patterns driven in great part by outdated local land use policy to articulating and promoting good local land use policy. There is clearly also much to be done to protect water resources and to address restoration issues, particularly as the areas of the state that will be most heavily developed in the coming years have significant water resource, habitat, and dam issues. Success is dependent on finding a more effective strategy for the state, local and regional partners to work together. This will mean appropriate planning, some tools, technical assistance with a toolbox to keep us organized, and incentives to use the tools.

RECOMMENDATION 7: 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.

Communities develop differently and at different rates. Sometimes communities that are developing the most rapidly barely have time to plan how to grow much less learn from the other communities in their state. Many new techniques have been developed across the country and in Massachusetts that are useful for encouraging development in environmentally sensitive ways. Providing municipal officials with successful tools, will enable communities to foster sustainable development, without burdening the environment and without adding workload to the regulators and permittees. Many of these development strategies involve a cooperative approach in which community officials, citizens, developers and the environment benefit.

Stormwater is one of the expected by-products of development and increased impervious surface. One of the easiest ways to control the volume and concentration of pollutants in stormwater is 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. Development of community “Growing Smarter Toolkit” by the Department of Conservation and Recreation (DCR) to share knowledge across towns will be useful. (See also “Technical Assistance” and “Incentives” sections) The toolkit should include by-laws, pre-development processes and environmentally sensitive design techniques and model communities: Open space, LID and environmentally sensitive design and landscaping techniques that lessen stormwater runoff through reduced impervious surfaces (e.g. no curbs, alternative road design and shared parking lots) and mitigate runoff through leaching areas and bioretention areas (rain gardens, vegetated medians)

Specific Actions

- Develop an informational packet and technical assistance strategy for towns:
 - Develop for stormwater and development: (a) general information and types of technical assistance available; (b) definition of Best Management Practices (BMPs) and make the information easily and widely available to communities; and (c) example communities such as Pinehills and Green Neighborhoods Alliance
 - Refer communities to stormwater by-laws and ordinances: (a) storm-water by-laws that encourages reduction in storm-water runoff through reduced impervious surfaces, construction of rain gardens and other landscaping techniques which filter runoff; ex. model by-law posted on AG website; (b) 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; (c) zoning ordinance from Cambridge, which incorporates green building standards (LEEDs) for certain sizes and types of structures; and (d) evaluate changing local zoning to require use of LID stormwater techniques for new construction within 200 feet of wetlands and rivers
 - Provide clear guidance to communities about non-acquisition protection strategies for critical water resources, describing model zoning, by-laws and ordinances. Specifically to adapt model by-laws and ordinances from regional partners such as MAPC that provide a level of protection to critical resources (e.g. headwaters, Zone IIs, aquifers critical for source water and recharge, significant soils, slopes, riparian buffers).
 - Redesign and distribute brochure for developers based on national LID brochure produced in cooperation with the National Home Builders Association
 - Develop a certification program for officials that receive training and adopt a pre-development planning process.
- Provide clear guidance and predictability to suppliers, localities, developers, and consultants regarding,
 - On specific water issues: (a) provide as part of technical assistance effort water budgets (see recommendation 2), data, assessments, and monitoring efforts (the science) in watersheds; and (b) centralize and/or link all appropriate state water policy documents, reports, permitting data, etc. in one portal
 - On sustainable development: (a) make information on sustainable development and smart growth available through the OCD, Executive Office of Environmental Affairs (EOEA), and MEPA websites (articulating criteria for “sustainable development” projects to be fast-tracked); and (b) where appropriate, make available online brochures for developers describing permit requirements and fast tracking

Timeframe: Growing Smarter Toolkit - 6 months-9 months

RECOMMENDATION 8: To protect aquatic habitats, including lakes and ponds, implement and integrate *Living Waters* and *BioMap* into planning, education, and outreach efforts to landowners and local decision-makers, and a mix of protection, smart growth, and restoration projects.

To protect and restore aquatic habitat areas, measures are needed to ensure the widespread dissemination of information on resource management, restoration and protection. Currently there are two exemplary EOEА-funded studies, the *BioMap* and *Living Waters*, not yet been fully integrated into the work of EOEА agencies. Even in a period of tight budgets, the Secretariat, together with local governments, should seek to maximize their impact by using these studies to focus conservation efforts and guide specific activities and decisions. Massachusetts lakes and ponds are particularly threatened by cultural eutrophication (nutrient enrichment and sedimentation caused by human activities in the lake or pond watershed) and the introduction of non-native invasive species that out-compete native aquatic and wetland species and alter lake ecology. Eutrophication and invasive species can particularly threaten the rare species that are the focus of the *Living Waters* report by altering the chemical, physical, and biological conditions in lakes and ponds where these species live. Once lakes or ponds have become eutrophic, or invasive species have become well established, restoration can be difficult and expensive.

Prevention, watershed protection, and swift early intervention are the best and most cost-effective means of dealing with these threats. Aquatic habitat restoration and protection requires a variety of tools, including the promotion of sustainable development (e.g., cluster development consistent with the protection of significant natural resources) and land protection (whether via acquisition or the use of model protection zoning), enhance local stewardship of lakes and ponds to protect them from cultural eutrophication, invasive species, and hydrological alteration; and facilitate lake restoration efforts.

Specific Actions

- Integrate data and recommendations from *Living Waters* and *BioMap* into state and local (land use, protection, etc.) planning
- Implement *Living Waters* and *BioMap* through educational outreach to landowners and local decision-makers, and some mix of conservation restrictions, purchase of critical land, and targeted habitat restoration; specifically: (a) educate Conservation Commissions, developers, watershed associations, and stream teams about importance of Core Habitats and Critical Supporting Watersheds and ways to protect them; and (b) incorporate *Living Waters* education in State programs that work with volunteers, such as Riverways RIFLS, Adopt-A-Stream and River Continuity
- In order to better protect and restore the ecological integrity of Massachusetts lakes and ponds: (a) inform municipalities, private land conservation organizations, and private landowners of the need to protect the core habitat lakes and ponds identified by *Living Waters* and the tools available to protect them; and (b) 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.

Partners: EOEА (DEP, DFG, DCR), MACC, COLAP

Timeframe: 6 months ~ ongoing

RECOMMENDATION 9: Develop a methodology for prioritizing restoration projects and measuring success based on the approach of using Target Fish and Fish Communities as an indicator of environmental conditions.

The earliest human impacts on Massachusetts' watersheds were caused by agricultural and industrial expansion, later by massive timber harvest, and more recently by damming (estimated to number more than 3000 in Massachusetts -or one dam for every four miles of stream) and industrial or urban waste disposal. In addition, development has resulted in changes in water quantity and quality and reduced habitat features such as tree cover, underbank refuge and cool temperatures. As a result, many rivers no longer function as habitat appropriate for fish or do not possess river-like physical characteristics. That is, they can no longer support traditional river fish species -the kind of fish that depend on flowing water and other river functions. In order to identify rivers and streams in need of restoration and the steps necessary to restore the rivers, a clear, replicable methodology is needed.

Specific actions

- For river mainstems and major tributaries in each basin, develop restoration goals based on the results of the Target Fish Community assessments
- Identify fish habitat for restoration on river mainstems and major tributaries*
- Identify the fish community and habitat integrity for small streams **
- For small streams, define appropriate fish community and habitat using an Index of Biotic Integrity (IBI) in representative streams***
- Devise an effective way to develop performance standards for streams, rivers and other water bodies from the data results and the actions cited above and integrate the performance standards into relevant studies (Water Assets Management, Watershed Action Plans, WMA, IBTA and other state and local permits and approvals, where appropriate)

Timeframe: 1*, 2**, and 4*** years

Cost: \$250,000 per year over 4 years

Over the longer term, restoration goal-setting and the definition of appropriate restoration actions would be advanced by a complementary study of changes in river channel stability due to development. This assessment of physical habitat would focus on erosion and sediment pollution and the resulting loss of aquatic habitat.

Currently, EOEА has a variety of land protection grant programs that complement local land acquisition priorities (Self-Help and Urban Self-Help programs in the Division of Conservation Services), that promote the acquisition of biodiversity/ecological lands (in the Department of Fish and Game), and that acquire land for state and urban parks, and the protection of estuaries in critical watersheds (in the Department of Conservation and Recreation). The criteria for these specific programs clearly overlap with many water resource priorities.

In addition, EOEА's Sustainable Development Team has been working closely with the Office for Commonwealth Development on a variety of initiatives to stimulate changes in local land use policy that will lead to more sustainable patterns of development. These initiatives include a systematic manner of coordinating discretionary capital programs and the Drinking Water and Safe Drinking Water State Revolving Funds across OCD secretariats to promote higher density housing and the protection of critical natural resources (Commonwealth Capital) and the promotion of Transit-Oriented Development, Incentives for Municipal Zoning Reform, and Permit Fast-Tracking for select projects that meet the Administration's Sustainable Development principles.

What is currently missing is a broad effort to secure critical water resources in high growth areas. As noted above the Task Force recommends exploiting to the fullest non acquisition strategies such as

expanding work the DEP has done to provide guidance to the southeastern region on zoning protections for drinking water related resources. But the permanent protection of key land areas can also be an effective and fiscally prudent strategy for the maintenance of the quality and quantity of our water resources.

RECOMMENDATION 10: Establish a grant program that works with communities to protect land critical to water resource priorities and seeks opportunities to thereby enhance natural treatment capacities and reduce costs.

In many cases the priority lands to protect are obvious to identify, such as municipal water supply lands. In other cases, determining the priority lands to protect requires assessment of a variety of criteria that help understand opportunities (e.g., impact on the source, additional uses, recharge areas, etc.).¹ Because of their significant role in the management of water and water resources, local and regional water entities can provide expertise to state efforts seeking to promote the protection of land supporting drinking water supplies, acting as natural “filtration” or “treatment” infrastructure, or complementing such infrastructure. These are important and fiscally prudent goals particularly, though not exclusively in areas with high rates of growth. Incorporating the program into Commonwealth Capital will help steer localities to sustainable development considerations and will maximize the state’s ability to leverage new land use patterns. Finally, in order to maximize fiscal responsibility, the grant should mirror the Self-Help program run by the Division of Conservation Services, which has long worked in partnership with localities to identify high-quality projects while leveraging significant resources from municipal, federal and not-for-profit partners.

Specific actions

- Protect quality and quantity of water supplies through a grant program to protect priority lands that: (a) prioritizes unprotected municipal water supply lands, Zone I and Zone II land areas, land over aquifers, land abutting headwater (primary order streams), and other riparian corridors in an effort to protect current and future drinking water supplies and biological integrity; (b) identifies acquisition projects so that towns can rely on natural filtration capability and avoid the cost of construction, operation, and maintenance of man-made infrastructure (filtration, treatment, supply); (c) leverages municipal and external resources; and (d) coordinates with other land programs or gives extra points if “Bio Map” or “Living Waters” land overlaps with key drinking water areas
- Include this strategy in a larger sustainable development strategy by coordinating the aquifer protection program with Commonwealth Capital

Timeframe: 6 months

Significant related recommendations can be found in the Technical Assistance and Incentives sections of the report. Technical assistance and the various incentives -including the leveraging of hundreds of millions of dollars through Commonwealth Capital to promote “Sound Water Policy” -are crucial for the protection and restoration of water resources and habitat, not to mention, of course, the sustainable development agenda.

IV. TECHNICAL ASSISTANCE AND COORDINATION

¹ Some of these can be developed through successful models, such as the Source Water Protection Demonstration Project done in the Squannacook-Nissitissit sub-basin utilizes one approach to modeling. Existing “GIS Watershed Analysis and Management” models provide a currently available way to identify critical lands scientifically on a parcel basis for conservation, restoration, or stormwater priority indexing.

Technical assistance was identified by specific members of the Task Force as a key priority. Technical assistance is not only important to the regulatory side of water policy; it is crucial to gaining a better working relationship and a more proactive posture on water policy that involves both the state and localities as partners. EOEAs Office of Technical Assistance (OTA) has long been a major provider of technical assistance, just as DEPs regional offices and Municipal Recycling Incentive Program (MRIP) have. Getting better results from permit interactions, resource protection, restoration and sustainable development will require a significant investment by the state in creating materials and coordinating interactions, outreach and ensuring that issues are raised in a timely manner.

RECOMMENDATION 11: Provide communities, developers and consultants with a single point of contact for technical assistance on interagency permitting issues, environmentally-friendly development strategies (including the ‘Growing Smart Toolkit’), fast-tracking, and resource protection strategies within EOEAs Office of Technical Assistance.

Technical assistance and a coordinated permit process will enhance a municipality’s/proponent’s ability to obtain appropriate permits in a timely manner and avoid costly and unnecessary delays. As for promoting sustainable development, the most significant assistance the state can give to communities, besides money, is clarity—about goals, regulations, incentives, interactions, role of planning and the overall policy vision set by the Administration. Being crystal clear about what the state sees as a priority goes beyond the purely water-related agenda and allows for municipalities to understand the connection between water resources management and the sustainable development agenda. It also allows the state to engage the private market through such mechanisms as permit fast-tracking for environmentally friendly developments and designs.

Technical assistance for environmental permits that involve more than one agency is best housed in EOEAs, as EOEAs 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 EOEAs as the agenda involves regulatory, recreational, agricultural and wildlife related issues, as well as issues related to other OCD agencies.

Specific actions

- 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
- Assign staff to coordinate permits for applicants and provide coordinated, consistent, and unbiased technical and regulatory assistance to municipalities from the pre-planning stages of a permit that involves various environmental agencies (see Recommendation 12 below)
- 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 (LID, Stormwater), Fast-Tracking, and nonacquisition land protection strategies specifically (See Recommendation 7)

Partners: Legislature, OTA, DEP, project proponents

Timeframe: 6 months

Cost: 4 staff positions

RECOMMENDATION 12: Create a working group to define pre-application processes, coordinated public comment periods and other coordinating strategies so as to arrive at holistic timelines for permits that involve various agencies (see textbox below regarding New Source Approvals and Dam Removal Restorations).

While technical assistance can help promote effective water management, sustainable development, protection and restoration strategies, there are clear benefits from simply coordinating interagency permitting activities more effectively. A community's ability to plan and act proactively is dependent on the state's own ability to make permit decisions -yes or no -on a timely basis.

Specific actions

Form a working group including MEPA, DEP, OTA, and representatives from other EOEAs and non-EOEA agencies to create permits requiring interagency involvement a coordinated process template and timeline, defining, as appropriate, steps to

- 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,
- Define interaction with pertinent non-EOEA agencies (the US Army Corps of Engineers, Mass Historical, Mass Highway, etc.) regarding relevant project permits and impacts through such vehicles as MOU
- Maintain current permit authority (e.g., the development and recommendation regarding permits within DEP regional agency offices, the power to make final decisions and provide oversight at DEP HQ), but coordinate timelines and identify permitting, plan approval, and single Environmental Impact Review (EIR) process redundancies (e.g., DEP drinking water and wetlands, local conservation committee, MEPA, WRC, etc.) so as to define a strategy to reduce duplicative processes
 - E.g., ensure that all interested parties have ample, appropriate opportunities to review, comment and appeal early in the process, thereby reducing late appeals
 - E.g., explore single application processes

Timeframe: 6 months

Permit coordination and technical assistance can enable local and regional water entities to get faster and more cost-effective answer to permits for New Sources. They can also help advance restoration goals. Currently, New Source Approvals can take months if not years and cost as much as \$1 million. There can be no weakening of environmental protection, nor should the state sacrifice the involvement of concerned parties. That said, every effort should be made to provide clarity and understandable timelines to permitting processes.

In order to improve the new source approval process, the Task Force suggested a single point of contact that convenes all regulatory parties in pre-application meeting(s), clarifying regulatory roles of state and local players (Conservation Commissions). Specifically, it recommended:

- Having a State Ombudsperson convene parties in pre-application session(s), before the regulatory clock starts: (a) coordinate new source review processes (WMA and IBTA) via a combined public comment period (similar to the MEPA process), and (b) call Natural Heritage into the process early
- Clarifying Conservation Commissions role
- Establishing 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 (a simple statement and locus map of where a new source would be located, how much water they hope to withdraw and other basic information).
- Considering including renewal schedules in IBTA approvals on new sources
- Developing model contracts for consultants to use with water suppliers

As regards restoration, often the best efforts are thwarted by a regulatory framework designed to prevent adverse environmental impacts rather than to facilitate the implementation of proactive restoration projects. On the specific issue of dam removals,

there are three primary areas of concern identified by staff of the aquatic restoration programs: time frames, costs and lack of regard to the long-term benefits of aquatic resource restoration. The goal of any attempt to creating a single point of contact and coordination would be to provide a regulatory process that supports and encourages proactive protection and restoration of aquatic habitat, and prevents habitat fragmentation, so as to improve the health of fish and wildlife. Given recent changes to dam safety regulations from DCR, there is reason to believe that the number of dam removal project proposals will increase significantly, highlighting the need to improve the permitting process for dam removals and other natural resource restoration projects, which currently is expensive and lengthy.

In order to improve the permitting process for dam removal so that the state, municipalities and private owners can take actions without incurring exorbitant costs, the Task Force suggested a similar solution. Specifically, it recommended

- Evaluating data from three dam removal projects (Dalton, Plymouth, Becket) to investigate time frames, costs, environmental benefits
- Researching New Hampshire "Single Permit Application" for applicability in Massachusetts
- Collecting data on number and type of requests for help regarding a prospective dam removal
- Implementing process that holds pre-application meeting among all parties (including the Army Corps of Engineers and MassHistorical) and tries to coordinate public comment processes
- Seeking a rebuttable presumption and an MOU with the ACE and MassHistorical to provide clarity and shorter timelines for permits related to dam removal and restoration projects
- Creating a template for a single permit application used by all regulatory reviews by agencies
- Evaluating whether the Environmental Results Program is appropriate for Small Dams (identify the type and extent of dams that could qualify for self-certification; apply Environmental Risk Index hazard and impact criteria; etc.)
- Running a pilot that (a) provides the template for recommended process(es) (b) helps establish criteria for determining what projects qualify as aquatic restoration and, if appropriate, helps develop a certification program for small dams

In both cases, the permits cut across a variety of agency desks and therefore working toward a standardized solution would take some time. In the case of New Approvals, probably something on the order of 4 months, while because of the complications and the negotiations necessary (and beyond the Executive) perhaps even up to a year.

Improved coordination with other OCD agencies, within EOEAs' 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 interagency opportunities to protect and restore aquatic habitats, that we are maximizing the work we can get done with the dollars we have (data, projects), and that we are in a systematic manner communicating about permit issues and regulatory changes within EOEAs.

RECOMMENDATION 13: Take advantage of the new OCD structure to advance more effective planning with Mass Highways and other development agencies. As a first step, work to improve culvert, bridge, road and roadbed design in order to address impacts to: (a) fish and wildlife passage at road/water crossings; and (b) habitat along highways.

The quality and quantity of fish habitat can be markedly reduced when roads and rivers come together. This is an avoidable outcome 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 especially helpful in addressing environmental issues related to road/water crossings and habitat along highways.

At the thousands of locations where streams and rivers within the Commonwealth are crossed by roads, artificial barriers such as (metal and some concrete) culverts and some bridges can, 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, 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 (Target Fish Communities).

There are also many habitat areas along highways, where highways and rivers share the floodplain and, because the height of a flood is increased by the volume of water displaced by the roadbed, roadbeds have to be armored to protect them from erosion by the river. Armoring the riverbanks lowers the value of habitat for fish and often means scant or non-existent vegetation between roads and nearby rivers. This is a problem for rivers, as riverbanks keep rivers shaded and cool in summer, provide habitat for invertebrates that fall into the river and serve as an important source of food for fish, and filter runoff and roadway pollutants before they reach the river. During summer months, direct, untreated runoff is often at a higher temperature than some fish species can tolerate. In the winter and spring, sand from winter treatments can enter the river, deprive fish eggs and invertebrates of oxygen-carrying water by clogging spaces between the rocks in the streambed, and suffocate them. Impacts can travel far downstream.

Specific Actions

- Improve Division of Fisheries and Wildlife (DFW) coordination with MassHighway on road/water crossings by: (a) offsetting project costs and coordinating to maximize use of existing Federal Grant Programs that support fish passage; and (b) working with MassHighway to develop crossing standards (as guidance for project design) and a GIS crossing database
- Work with MassHighway to involve the DFW early in the design of roadways where a road/water crossing occurs such that DFW can: (a) review Transportation Improvement Project lists for fish and wildlife passage concerns; and (b) promote new structures, retrofits, and designs that meet Target Fish Community passage needs ²
- Continue River Continuity pilot in order to work with communities directly, emphasizing outreach to DPWs as they undertake new construction or maintenance projects. (The pilot includes Riverways Program working with volunteers to survey and identify problem culverts, and working directly with communities on pilot retrofits and replacements.)
- Form a working group to draft a Best Management Practices guidance document for habitat lands next to roadways, including: (a) after addressing highway safety concerns, management strategies to use existing strips of land between roads and nearby rivers; (up to 200 feet) as resource areas for shade, nutrient absorption and habitat value to the river; (b) sweep and recover sand as soon as possible; (c) define Best Management Practices on existing dirt road to control runoffs; and (d) articulate steps to control invasive plants along right-of-ways
- Work with MassHighway to involve the DFW early in the design of roadways abutting habitat lands such that MHD: (a) avoids, to the extent possible, enlarging roads that share the flood plain with a river; (b) avoids increasing the length of armored riverbank (armoring riverbank only causes the river to move in another direction and increases the chances of causing other problems downstream); and (c) controls road runoff using infiltration and retention structures; (d) consider relocation of roads away from rivers as an economically and environmentally viable option to reduce the impact to the river and prevent periodic expensive maintenance to the roadbed

Timeframe: 1-2 years

Cost: \$30,000 / year for 3 years

² Addressing passage needs might entail, where possible, using bridges to cross water rather than culverts; providing at least one side of natural riverbank for wildlife passage at all crossings; in cases where culverts are necessary, setting them deep enough so that the bottom of the structure is well below grade and making them high and wide enough so that most river flows pass without causing backwater effects; and, finally, retrofitting existing structures with fish- and wildlife-friendly structures to meet Target Fish Community passage needs as maintenance projects are undertaken

Finally, in order to improve coordination among its agencies, EOEA will create an Interagency Water Committee composed of key water staff from EOEA agencies to implement interagency initiatives; improve coordination of capital, data gathering, assessment and monitoring activities; share information (including information about regulation development and permitting) in a structured and scheduled manner; and coordinate outreach.

Clearly, staff across EOEA agencies already does a fair amount of meeting and communicating, but that communication and coordination is often sporadic and does not reach the level of goal-setting within or across fiscal years. The EOEA Interagency Land Council does an effective job of both long- and short-term planning and therefore has been able to articulate broader policy statements and coordinate the use of money and science more effectively than has been the case in the area of water. It is incumbent on EOEA to make sure communication is more systematic between water staff and, therefore, the Secretariat will form an Interagency Water Committee composed of key water staff from all its agencies to coordinate data collection, assessment and monitoring activities, and to:³

- Coordinate with external stakeholders (WRC members, watershed associations, universities)
- Coordinate projects, reports and individual data, assessment and monitoring efforts to alleviate redundancies and identify areas where multiple data gathering can happen simultaneously. Also review data generated by other partners and entities (e.g., stream gages and placement of water quality monitoring equipment)
- Coordinate capital planning
- Share relevant permit application information
- Coordinate communication to regulated parties (municipalities, businesses, etc.) and to government and other partners (WRC members, watershed associations, universities) to reduce redundancy and maximize clarity
- Inventory current partners and potential partnership so as to determine a more effective way of working together and coordinating grant seeking
- Form working groups to address key issues like habitat restoration, desalination, create templates for existing plans, etc.
- Advise the Undersecretary for Policy as to how best to implement WRC policy decisions

V. INCENTIVES TO USE THE TOOLS

The regulatory changes described in Sections II and III, and in recommendation 12, will stimulate action and provide flexibility and greater clarity for local and regional partners. In addition, recommendations to promote planning and the provision of robust technical assistance will help build a more effective working relationship between the state and its local and regional partners. Money is, it goes without saying, a crucial element in any strategy that seeks to engage municipalities in the promotion of best water resource management practices. One way to increase the impact of state policies is to include on a consistent basis desired actions as criteria in grant and loan applications. In this section are two recommendations as to how the state can better coordinate and harness grants and loans to promote water management and sustainable development goals.

³ The IWC is not to duplicate but to complement at the agency level the larger picture view of the Water Resources Commission, which is the body that has been established by statute as the primary entity responsible for water policy.

RECOMMENDATION 14: Promote sustainable development, timely maintenance of old infrastructure (Fix-It-Early), and the protection of priority water resources through refinements to the Clean and Drinking Water State Revolving Fund loan programs.

The Clean and Drinking Water SRF’s foundational objectives are to promote public health, compliance and the affordability of water. Within that context, there is flexibility to promote wider 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 staff is currently incorporating a more significant consideration of sustainable development into the SRF evaluation (inclusion of Commonwealth Capital evaluation at 20 percent of total score). Though much of the funding for the Clean and Drinking Water State Revolving Funds, which generally account for more than \$400 million annually, goes to fund Consent Orders, discussions with DEP staff suggest that approximately \$50 to \$60 million annually goes to extensions to current water and sewer infrastructure networks. To ensure that the programs meet federal objectives and also fulfill broader state environmental objectives, the SRF evaluation should be adjusted to reflect more clearly and to invest more actively to promote the state’s agenda of higher density growth whether in downtown areas or in "new “growth centers.”

In addition, the Governor’s Fix-it-First principle is being applied across a vast cross section of areas. One of the more crucial ones is with respect to old infrastructure, which due to a combination of lack of adequate maintenance and old age is in dire need of repair. Before communities begin to look at expanding their water infrastructure via sewer and water extensions (and adding additional pipe mileage), the state would like provide more incentives to “Fix-It-Early” so that communities conduct the routine maintenance that both prevents problems later and helps reduce impacts today, i.e., regular efforts to prevent/remediate infiltration and inflow. The state would like to focus on investing in repair and maintenance of existing infrastructure by incorporating the policy at the state level in various project and grant evaluations, and at the local level via a dedicated revenue stream.

Specific Actions

- Encourage ongoing maintenance of existing wastewater and water infrastructure by: (a) giving preference or evaluation points to communities fixing old infrastructure priority in state grants and permits (over those seeking expansions); or (b) using year-end slippage in the program (approximately \$20 million) to fund exclusively Fix-It-Early projects
- Adjust the DW and CW SRF applications to revise the caps on new capacity in downtown areas, previously developed areas and “new growth centers” to promote development in target areas and to reduce the likelihood of extensions for traditional subdivision development
- To make these changes workable: (a) OCD and its agencies should provide coordinated technical assistance to municipalities, in collaboration with the MMA, Regional Planning Agencies, and watershed associations; (b) a special technical assistance fund should be created for regional water authorities to ensure that these additional criteria are not burdensome and that their communities can complete applications in a timely manner; and (c) outreach to all stakeholders, including regional water authorities, water departments, municipalities, the legislature, the Environmental Protection Agency (EPA), the development community, and others will be needed in developing these changes
- Require adequate metering of wastewater between the system and households/users
- If legislative effort to promote enterprise accounts—dedicated to reflect the true cost of wastewater and water operation, maintenance, and replacement costs—fails, require enterprise accounts as part of SRF application

Partners: DEP, EOE, EPA, Municipalities

Timeframe: 9 months

RECOMMENDATION 15: Actively promote greywater (reclaimed water) reuse at specific recreational and institutional venues and new large development sites

Specific Actions

- Strongly encourage use of grey water (particularly reclaimed wastewater) for ballparks, golf course, and other recreational irrigation and state maintained properties, as well as for large-scale development projects through MEPA, DCS Self-Help and Urban Self-Help grants, and relevant DHCD grant programs
- Develop guidance document for distribution to the Department of Housing and Community Development (DHCD) in interaction with developers and use in its programs to consultants and to municipalities
- Provide incentives and develop pilot projects
- Investigate other efforts across the country and locally, and seasonal use of greywater

Timeframe: 1-2 years

The Task Force also articulated “Sound Water Policy” criteria for inclusion in the OCD agency-wide Commonwealth Capital application.⁴ In this way, the state is looking to leverage tens of millions of dollars in discretionary capital and hundreds of millions of dollars in SRF loans to promote support sound water policy and use decisions that protect aquatic habitat and designated uses. The goal was to define actions that would get localities started toward a “Sound Water Policy,” allowing for refinements in future years. Specifically, the Task Force called for the following criteria:

- Water Conservation Standards consistent with the state’s Water Conservation Standards
- Implementation of: (a) stormwater BMPS; (b) LID techniques; (c) other subdivision or zoning measures; and
- Integrated Water Management Plans

The Task Force suggested that the criteria be revisited in FY07 and the points dedicated to “Sound Water Policy” criteria increased.

VI. DATA

New data gathering and assessment efforts will need to be targeted to support priorities of the present Water Policy; specifically: (a) the expansion of the current “Stress/ Flow” framework definitions toward “water budgets” in the short-term and over time toward modifying and updating the standards to reflect and integrate more effectively the relationship between water quantity and quality and the protection of existing and designated uses; (b) the articulation of a cost-effective Infiltration and Inflow (I/I) monitoring and assessment strategy; and (c) the development of Target Fish performance standards to help prioritize restoration projects.

(a) Expand the current “Stress/ Flow” framework definitions developed by the Water Resources Commission, establish “water budgets,” and move gradually and systematically toward modifying and updating the standards to reflect and integrate more effectively the relationship between water quantity and quality and the protection of existing and designated uses. The Water Resource

⁴ Commonwealth Capital is a new policy applying to various transportation, housing and environmental grant programs requiring that communities seeking a grant or loan from these programs demonstrate the municipality’s efforts to promote compact growth and environmental protection. The main focus of Commonwealth Capital is to encourage the implementation of land-use regulations consistent with state- and region-wide sustainable development goals.

Commission's interim definition of a flow "stressed" basin is an important step in establishing clear parameters on permit requests and review. The Task Force believes that an accommodation within the "stressed" basin concept to incorporate thresholds for "adequate flow" and "near stressed" basins would complement other ongoing efforts and would meet communities' need for clear guidance on how to meet future water supply and wastewater needs while protecting and restoring water resources.⁵ 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 sub-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.

Specific actions

- Assemble the data that will provide the basis for greater considerations of flow in the regulations (e.g., WMA) and approvals (e.g., IBTA)
- Complete the Water Asset Management (WAM) studies for the entire state
- Through the Streamflow Standards Task Force and the US Geographic Survey (USGS) cooperative program develop streamflow standards for each river basin (sub-basin)
- Build "water budgets" for individual communities and regions from the WAM and the streamflow standards**
- Define "adequate condition" and "near-stressed" basins in order to complement the WRC's definition of "stressed basins" in order to allow for incentives and triggers to be developed for planning and actions before basins become stressed *
- Focus information dissemination and outreach efforts on providing information about natural stream flow to all players (water suppliers, municipalities, etc.)

Timeframe: 1 year*, 2 years**, longer-term***

(b) Define cost-effective "Infiltration and Inflow" monitoring and assessment strategy. Infiltration and inflow (I/I) 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. Inflow is easier to remove from the system compared to infiltration since it enters the system mainly through point sources. Often the percentage of both these flows in the infrastructure is over 50 percent of the total wastewater flow that reaches a wastewater treatment plant. This often clean non-sanitary flow results in a surcharge of the sewer system, overflows, increased operating costs at treatment plants, and is responsible for large movement of water from one basin to another basin, thus affecting the water budget. In order to minimize and ultimately eliminate both these sources of water, it is imperative to first identify where the leaks and inputs occur and devise a prioritized and cost-effective mechanism to conduct long-term monitoring.

Specific Actions

- Prioritize resources to focus on dewatering and pollution effects of I/I
- Review the Massachusetts Water Resource Authority's (MWRA) I/I strategy and evaluate transfer of practices and lessons to rest of the State

Timeframe: 1 year

⁵ E.g., the development of a stream flow policy for the state (initiated in Spring 2003), which will include seasonal streamflow goals for the state's rivers, and policies for the use of the flows with respect to allocation and actions triggers; the USGS's ongoing habitat studies and hydrological analyses; and the Water Resource Commission's Streamflow Task Force (initiated in February 2004).

(c) 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 (Karr, 1987) and can be monitored to evaluate and measure restoration progress and success. This recommendation describes a scientific process developed by DFW 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.

Specific actions

With the goals of: (a) developing restoration goals for river mainstems and major tributaries for each basin using the Target Fish Community approach; (b) identifying fish habitat for restoration on river mainstems and major tributaries*; (c) identifying the fish community and habitat integrity for larger streams ** (d) developing an Index of Biotic Integrity (IBI) for small streams***; and (e) develop a methodology for using target fish as an indicator of environmental conditions and as targets for restoration

- Gather information from Conservation Commissions to update cold water resources*
- Finish regional development of Target Fish Communities for key watersheds*
- Habitat mapping to establish the most efficient means of achieving physical habitat or flow restoration in each watershed (or mesohabitat mapping on all or representative portions of all watersheds greater than 30 square miles.)
- Develop “performance standards” for streams, rivers and other water bodies in a manner that fits the Stress Framework (for use in permits, approvals, offset banking

Timeframe: 1*, 2**, and 4*** years

Cost: \$250,000 per year over 5 years

(d) Provide a quantifiable “target structure” assessment/study to help prioritize actions to sustain fish, wildlife aquatic and other water dependent organisms and ecosystems

The increasing intensity of development in Massachusetts has altered the natural flow regime and sediment load of many rivers, creating unstable river channels. Changes in river channel stability due to development cause erosion and sediment pollution and result in the loss of aquatic habitat. To better understand the stream processes that govern river channel stability, 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.

Specific Actions

- Determine regional curves of river channel hydraulic geometry by relating river channel structure with long-term flow data to describe the expected physical structure of stable rivers in each hydrologic region of the state
- Develop a target river habitat structure in each hydrologic region of the state using river cross-sectional surveys and habitat data from reference reaches**
- Identify a flow regime and accompanying river structure that is achievable in an urban or suburban setting. Establish stable habitat restoration targets over a range of watershed development levels for each hydrologic region***

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

Timeframe: 1*, 2**, and 4*** years

APPENDIX A. FOR FURTHER 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), storm water (Storm water Phase II) and wastewater (NPDES) permits throughout the watershed. Making use of lessons learned from the pilot, over the next year DEP should develop a process and regulatory changes in order to standardize “watershed permitting” on a wider basis.

Justification: 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.”

Specific actions

- Determine data and measurements that is not currently in hand; e.g., 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.
- A not-for-profit (university or environmental advocacy group) should study the outcomes of this effort related not only to good environmental impacts but also workability (efficiency for the agencies and for regulated parties).

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

Timeframe: 12 months

RECOMMENDATION A-2: Review current NPDES Permit structure

Justification: Currently NPDES permits are issued by EPA Region 1. DEP should explore with EPA designing delegation to focus on results rather than activities requirements. This option should be explored with EPA with an agreement in advance about flexibility in implementation. Developing a sustainable revenue stream for a delegated NPDES program poses a significant challenge and needs considerable attention if delegation is pursued. There are many advantages to Massachusetts assuming delegation of the Clean Water Act, including more control over setting our own priorities and more flexibility for creative problem solving. However, assuming delegation may be expensive.

Specific Actions

- The state along with EPA should explore feasible options for a more performance based delegation based on water quality

Partners: DEP, EPA, Interagency Water Council (IWC)

Timeframe: Long Term: 2-4 years

RECOMMENDATION A-3: Provide a quantifiable “target structure” assessment/study to help prioritize actions to sustain fish, wildlife aquatic and other water dependent organisms and ecosystems

Justification: The increasing intensity of development in Massachusetts has altered the natural flow regime and sediment load of many rivers, creating unstable river channels. Changes in river channel stability due to development cause erosion and sediment pollution and result in the loss of aquatic habitat. To better understand the stream processes that govern river channel stability, 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.

Specific Actions

- Determine regional curves of river channel hydraulic geometry by relating river channel structure with long-term flow data to describe the expected physical structure of stable rivers in each hydrologic region of the state
- Develop a target river habitat structure in each hydrologic region of the state using river cross-sectional surveys and habitat data from reference reaches**
- Identify a flow regime and accompanying river structure that is achievable in an urban or suburban setting. Establish stable habitat restoration targets over a range of watershed development levels for each hydrologic region***

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

Timeframe: 1*, 2**, and 4*** years