PUBLIC NOTICE

US Army Corps of Engineers®
New England District

696 Virginia Road
Concord, MA 01742-2751

Date: October 2, 2012
Comment Period Ends: November 1, 2012
File Number: NAE-2007-2926
In Reply Refer To: Ruth M. Ladd
Or by e-mail: ruth.m.ladd@usace.army.mil

The District Engineer of the New England District, Corps of Engineers ("Corps") has received a prospectus dated September 26, 2012 for an In-Lieu Fee ("ILF") Program covering the Commonwealth of Massachusetts. This prospectus proposes an ILF program in compliance with 33 CFR 332, Compensatory Mitigation for Losses of Aquatic Resources ("Mitigation Rule"). The Mitigation Rule was published in the Federal Register on April 10, 2008.

SPONSOR: Massachusetts Department of Fish and Game, 251 Causeway St., #400, Boston, MA 02114

If this prospectus is deemed sufficient, the sponsor will be authorized to develop a draft ILF instrument for review by an interagency review team of federal and state agency. If the draft instrument is acceptable, the ILF program will be established through the development of a final ILF instrument to be signed by the sponsor, the Corps, and other agencies which choose to do so. The process will follow the Mitigation Rule.

The proposed ILF program would provide an alternative or a supplement to permittee-responsible mitigation if it is deemed appropriate during the review process for proposed unavoidable impacts authorized under Section 404 of the Clean Water Act ("Section 404") and Section 10 of the Rivers and Harbors Act of 1899 ("Section 10"). The entire prospectus, entitled **"Prospectus for a State-wide In-Lieu Fee Program Administered by the Massachusetts Department of Fish and Game,"** is attached to this Public Notice.

The decision whether to authorize the sponsor to proceed to the next step of developing a draft ILF instrument will be based on the District Engineer's ("DE") determination of the potential of the proposed ILF program to provide compensatory mitigation for activities authorized by Department of the Army permits.

The Corps of Engineers is soliciting comments from the public: federal, state, and local agencies and officials, Indian Tribes, and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to allow the sponsor to proceed to develop a draft ILF instrument. Comments are also used to determine the need for a public hearing.

In order to properly evaluate the proposal, we are seeking public comment. Anyone wishing to comment is encouraged to do so. **Comments should be submitted in writing by November 1, 2012.** If you have any questions, please contact Ruth M. Ladd at (978) 318-8818 or (800) 343-4789.

The initial determinations made herein will be reviewed in light of facts submitted in response to this notice. All comments will be considered a matter of public record. Copies of comment letters will be forwarded to the sponsor and the Interagency Review Team consisting of representatives of the Corps, Environmental Protection Agency, US Fish and Wildlife Service, National Marine Fisheries Service, Massachusetts Department of

Environmental Protection, and Massachusetts Coastal Zone Management.

For more information on the New England District Corps of Engineers programs, visit our website at http://www.nae.usace.army.mil.

THIS NOTICE IS NOT AN AUTHORIZATION TO DO ANY WORK NOR DOES THE IN-LIEU FEE PROGRAM, IF APPROVED, PREJUDGE FUTURE DEVELOPMENT PROJECTS WITHIN THE SERVICE AREA.

JENNIFER L. MCCARTHY
Chief, Regulatory Division

If you would prefer not to continue receiving Public Notices, please contact Ms. Tina Chaisson at (978) 318-8058 or e-mail her at bettina.m.chaisson@usace.army.mil. You may also check here ( ) and return this portion of the Public Notice to: Bettina Chaisson, Regulatory Division, U.S. Army Corps of Engineers, 696 Virginia Road, Concord, MA 01742-2751.

NAME: _____
ADDRESS: _____

Deval L. Patrick
Governor
Timothy P. Murray
Lieutenant Governor

Commonwealth of Massachusetts
Department of Fish and Game
251 Causeway Street, Suite 400
Boston, Massachusetts 02114
(617) 626-1500
fax (617) 626-1505

Richard K. Sullivan, Jr.
Secretary
Mary B. Griffin
Commissioner

Prospectus for a State-wide In-Lieu Fee Program administered by the Massachusetts Department of Fish and Game

September 26, 2012

Table of Contents

I. Introduction and Need 3

II. DFG's Qualifications to be a Program Sponsor 3

III. How the In-Lieu Fee Program will be Established and Operated 5

IV. Compensation Planning Framework 6

1. Goals and Objectives of DFG's ILFP 6
2. The Service Areas for DFG's ILFP 7
3. Description of the Threats to Aquatic Resources in MA 9
   - A. Coastal Resources 10
   - B. Inland Resources 10
4. Historic Aquatic Resource Loss and Current Aquatic Resource Conditions 12
   - A. Historic Aquatic Resource Loss 12
   - B. Current Aquatic Resource Conditions 13
5. Aquatic Resource Goals and Objectives 13
6. Prioritization Strategy 13
7. Public and Private Stakeholder Involvement 15
8. The Restoration Component of DFG's ILFP 15
   - A. Coastal/Marine Aquatic Resources 15
   - B. Inland Aquatic Resources 17
9. The Land Preservation Component of DFG's ILFP 18
10. Monitoring and Long-Term Management 22
    - A. Monitoring of Mitigation Projects 22
    - B. Ownership Arrangement and Long-Term Management of Mitigation Projects 22
11. Program Reporting 23
12. Periodic Evaluation of the ILFP 24

V. Administration of DFG's ILFP 24

1. Mitigation Credits 24
   - A. The Generation of Credits 25
   - B. The Release of Credits 25
   - C. The Sale of Credits 26
2. Program Account 26
3. Administrative Overhead Set-aside 28

Appendix A – Restoration Planning Information 30

I. Introduction and Need

The Department of Fish and Game ("DFG") is pleased to provide this prospectus for a state-wide In-Lieu Fee Program ("ILFP") that would be administered by DFG as the ACOE-approved program sponsor in accordance with the final rule issued by the ACOE and EPA in 2008 at 33 C.F.R. Part 332 (the "2008 rule"). The 2008 rule governs in-lieu fee compensatory mitigation associated with ACOE permits under §404 of the Clean Water Act and/or §§9 or 10 of the Rivers and Harbors Act of 1899.

The need for an effective, state-wide compensatory mitigation program is evident in Massachusetts, given the historic loss of and continuing threat to aquatic resources across the state. Section III.3 and 4 of this prospectus provide a summary of the scope and array of historic and current threats to both coastal and inland aquatic resources, which is consistent with the trend nationwide. The nature and scale of this problem supports the need for an alternative to ACOE permittee-responsible, on-site compensatory mitigation that will result in additional high quality mitigation. The objective is to supplement – not replace – the existing compensatory mitigation requirements and practices under the state Wetlands Protection Act and state Clean Waters Act.

In order to achieve the above outcome, this broader scale supplement to state-required on-site mitigation must encompass both the small-sized projects covered under the Massachusetts General Permit ("MA GP") and individual ACOE permits. DFG's own experience with compensatory mitigation and land protection shows that the most effective approach takes into account the larger landscape/watershed context, including assessing the extent to which a mitigation project contributes to the sustainability of an ecosystem. Moreover, the funding potential to accomplish these mitigation objectives in Massachusetts appears to be substantial.

Finally, as set forth in this prospectus, we believe that DFG and its divisions have the expertise, capacity and compensatory mitigation framework to develop and administer an innovative and effective ILFP.

II. DFG's Qualifications to be a Program Sponsor

The Department of Fish and Game ("DFG"), an agency of the Commonwealth established pursuant to M.G.L. c. 21A, §8, is uniquely qualified to be the sponsor of the ACOE's in-lieu fee program in Massachusetts. DFG is responsible for the management and protection of the Commonwealth's wildlife, including marine fisheries, as well as the habitats that support the state's wildlife. DFG's three divisions, in turn, have specific authority and responsibilities associated with the core components of DFG's overall mission, which often overlap in complimentary fashion:

The Division of Marine Fisheries ("DMF") has the authority and responsibility under M.G.L. c. 130, §17 for the development and stewardship of marine fisheries resources, habitat, and harvest as authorized under G.L. c.130, §17. DMF's fisheries management activities are performed through a long-standing strategic partnership with the National Marine Fisheries Service and extensive involvement with the New England

and Mid-Atlantic Regional Fishery Management Councils, the Atlantic States Marine Fisheries Commission, and the Massachusetts Marine Fisheries Advisory Commission.

DMF is an experienced administrator of compensatory mitigation projects, including for authorized impacts to aquatic resources, in particular Essential Fish Habitat (EFH) and aquatic habitats of managed diadromous fish and marine finfish and shellfish species in Massachusetts' waters, as well for authorized impacts to aquatic fish and shellfish habitat in Massachusetts. For these reasons, the ACOE, DFG and DMF entered into a Memorandum of Understanding ("MOU") in June, 2008 authorizing DMF to be the program sponsor for the ACOE's ILFP associated with providing compensatory mitigation for impacts to aquatic habitats of marine and diadromous fish species in Massachusetts. The existing MOU, however, is limited to providing compensatory mitigation associated with in-lieu fee projects that will fill less than one acre of aquatic habitat and meet the criteria for coverage under the MA GP issued by the ACOE pursuant to the 2008 rule. DMF has the experience and capacity to provide compensatory mitigation associated with individual permits as well, which would be an important feature of DFG's ILFP. Thus, a division of DFG is already a qualified program sponsor for the marine and diadromous fisheries component of DFG's proposed ILFP.

The Division of Ecological Restoration ("DER") was created in July of 2009 with the merger of the DFG's existing Riverways Program and the Wetlands Restoration Program previously housed within the state's Coastal Zone Management Office. DER coordinates ecological restoration to improve habitat for fish and wildlife and to restore important ecosystem services that benefit the quality of life for all Massachusetts citizens. The Riverways Program has been maintained within the DER and continues to coordinate outreach and technical assistance to support river conservation and protection.

DER and its municipal and NGO partners facilitate capital-based projects, including but not limited to, dam removal and culvert replacement with the goal of restoring aquatic habitats and ecosystems across the state. In addition to restoring valuable aquatic resources, DER-sponsored projects support commercial and recreational fisheries and provide many other ecological and public benefits such as reduced flooding, improved water quality, and the replacement of aging infrastructure. As discussed below, DER already has an established, substantial portfolio of active physical restoration projects that have the potential to serve as compensatory mitigation projects under a DFG ILFP.

The Division of Fisheries and Wildlife ("DFW") is responsible under M.G.L. c. 131 for the conservation, restoration, protection and management of the inland fish and wildlife resources of the Commonwealth. DFW's mission also includes conserving and protecting endangered, threatened and species of special concern pursuant to the Massachusetts Endangered Species Act, M.G.L. c. 131A ("MESA"), and the MESA regulations promulgated thereunder at 321 CMR 10.00. As discussed below, in its role as regulator under MESA, DFW has developed extensive expertise and experience developing, approving and overseeing the implementation of compensatory mitigation projects, with a particular focus on preserving the habitats of state-listed species. DFW's proposed Conservation Plan for the Eastern Box Turtle represents a current example of a forward thinking restoration/conservation planning framework. As discussed in more detail in Section IV.5 below, this type of compensatory mitigation approach and

experience will complement and strengthen the preservation of the aquatic resources component of DFG's proposed ILFP.

Finally, ***the DFG land protection program*****,** a joint partnership between DFG and DFW**,** identifies and protects the most ecologically important habitats throughout Massachusetts, including the high value fish and wildlife habitats and natural communities. More specifically, the goals of the DFG land protection program are to protect and perpetuate functioning ecosystems that contain significant fish and wildlife resources, to conserve biological diversity, and to provide adequate routes for public access to the lands and waters of the Commonwealth. The program targets river corridors, wetlands, various types of forested upland, habitat of state-listed species, and other types of high quality habitats. Current holdings stretch from Berkshire County to Cape Cod and the Islands and total more than 190,000 acres. DFW manages over 160,000 acres as Wildlife Management Areas for conservation and outdoor recreation.

Funding for DFG's land protection program comes from two principal sources, the largest of which is the Commonwealth's Open Space Bond authorizations, also known as Environmental Bond Legislation. Open space bond acts must be approved by the State Legislature and Governor, and the annual spending limit is determined by the Secretary of Administration and Finance and approved by the Governor's office. In fiscal year 2010, DFG had over $10 million approved for the land protection program. The other funding source for our land protection program is DFW's Inland Fish and Game Fund's Wildlands Conservation stamp fund. This fund, which serves as the basis for a budgetary appropriation each fiscal year, derives its revenues primarily from five dollar contributions made by persons who purchase fishing, hunting, sporting, and trapping licenses issued by DFW. In aggregate, revenues from these sources have generated more than a million dollars annually for protection of wildlife lands.

In short, DFG's land protection program, together with DFW's compensatory mitigation initiatives under MESA, provides a sound foundation for the land preservation component of our proposed ILFP.

III. How the In-Lieu Fee Program will be Established and Operated

As noted at the outset of this prospectus, a state-wide ILFP would be administered by DFG as the ACOE-approved program sponsor in accordance with the procedures and requirements of the 2008 rule. DFG would propose compensatory mitigation projects for approval by the ACOE, which would also be reviewed by the Interagency Review Team ("IRT"). The IRT would make a recommendation to the ACOE, as the final decision-maker, to approve or not approve each proposed mitigation project. The IRT is also responsible for reviewing the documentation for the establishment and management of DFG's ILFP. DFG assumes that the IRT for the state-wide ILFP would be similar in composition to the IRT associated with DMF's existing ILFP for aquatic habitats of marine and diadromous fish species (i.e., be composed of representatives from the ACOE, EPA, USFWS, NMFS, MA DEP and MA CZM). The ACOE has indicated that other agencies may serve as resources to the IRT for specific mitigation projects. Because of that already existing ILFP, DFG understands the purpose of the IRT's role and has experience interacting with the IRT in a constructive manner. Under the 2008

rule, the IRT and the general public will both be providing their comments on this prospectus. It is also our understanding and expectation that DFG and its Divisions will have a proactive "seat at the table" to interact with the IRT during the implementation of the ILFP.

Following the approval of the prospectus, DFG will be developing a draft program instrument for review by the ACOE and the IRT, which will address in further detail the matters covered by this prospectus. The compensation planning framework section below includes a description of the goals and objectives of DFG's ILFP, the ILFP service areas, and the operational approaches for the coastal/marine and inland aquatic resource restoration programs and the land preservation program. As explained in the relevant subsections, DFG's ILFP has the benefit of building on existing expertise and well established processes in our Divisions: DMF's existing ILFP, DER's portfolio of restoration projects, and DFG/DFW's jointly administered land protection program.

IV. Compensation Planning Framework

1. Goals and Objectives of DFG's ILFP

The goals and objectives of DFG's ILFP are summarized as follows:

- To address a real need in Massachusetts for a alternative to ACOE permittee-responsible, on-site compensatory mitigation that will result in a broad range of enhanced coastal and inland aquatic resource restoration and land preservation across the state;

- To complement and further the Commonwealth's policy of no-net loss of wetlands, as well as support and supplement MassDEP's compensatory mitigation requirements and practices under the Wetlands Protection Act and MA Clean Waters Act.

- To broaden the availability of the in-lieu fee mitigation option beyond the small-sized projects regulated under the ACOE's MA GP to cover the individual permits ("IPs") required for major projects by the ACOE;

- To establish a DFG ILFP that utilizes and benefits from the existing technical expertise, the tools and programmatic experience of DFG's three divisions, and a land protection program to expand the geographic reach and diversity of ILFP compensatory mitigation projects;

- To implement a comprehensive compensatory mitigation strategy for both inland and coastal resources within each service area that is based on a detailed analysis of the loss of and threats to specific aquatic resources as well as other watershed-scale stressors, the identification of land preservation focus areas and ecological restoration opportunities, and an expanded list of potential impacts by type and their corresponding mitigation ratios;

- To establish and administer a single expendable trust account in accordance with the Office of the State Comptroller regulations that will hold and track the in-lieu fees accepted and disbursed by DFG's ILFP in a manner that will meet the objectives and requirements of the 2008 rule.

2. The Service Areas for DFG's ILFP

The 2008 rule requires the program sponsor to identify the service areas for their ILFP. A service area is defined in the 2008 rule as the watershed, ecoregion, physiographic province and/or other geographic area within which the in-lieu fee program is authorized to provide compensatory mitigation required by ACOE permits. DFG is proposing to sponsor a state-wide ILFP consisting of the four major Massachusetts bioregions:

(1) Berkshire/Taconic;

(2) Connecticut River Basin;

(3) Quabbin/Worcester Plateau; and

(4) Coastal.

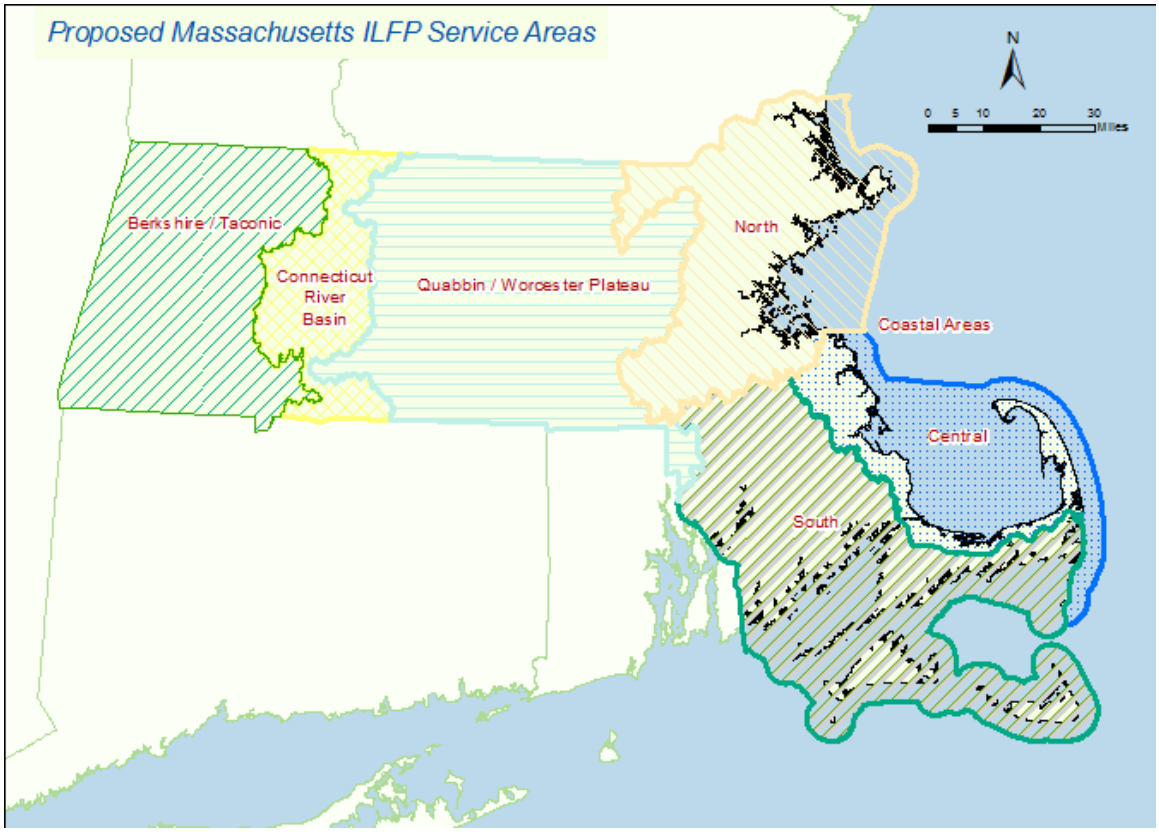
The four major service areas represent geographically distinct and administratively manageable units. While Massachusetts eco-regions are defined in different ways depending upon refinements of scale, the four main service areas are separated by differences in underlying geology, soils, vegetation, land-use and geography. In developing these service areas, EPA's Level IV eco-regions were consulted as well as eco-regions as defined by *BioMap 2*, jointly produced by DFG and the Nature Conservancy. Larger, but geographically distinct service areas will not only offer a greater array of potential mitigation opportunities, but they will allow DFG to identify land preservation and restoration projects that are most closely associated with impacts to specific habitat types, ensuring that habitat-specific loss is mitigated most effectively without artificial constraints. During the development of the program instrument, DFG may further refine the boundaries of its proposed service areas to ensure the achievement of the above program objective. In addition, DFG will consult with the ACOE and the IRT prior to our proposing mitigation projects for each of the service areas.

DFG's proposed service areas are depicted and described in more detail below.

The ***Berkshire/Taconic*** service area is dominated by unfragmented, mixed hardwood forests of the Taconic Mountains and the Berkshire Plateau and associated wetlands and calcareous fens. The Housatonic, Farmington and Hoosic Rivers are the major watersheds within the service area and are part of the Western New England Marble Valley. There are significant floodplain forests along the Housatonic River and its tributaries and an abundance of high gradient, cold water streams that support an array of fluvial dependent species such as Eastern Brook Trout are found throughout the service area. Natural lakes and ponds are abundant especially in the lower Berkshire Hills.

The ***Connecticut River Basin*** service area encompasses the entire Massachusetts portion of the 410-mile-long Connecticut River, New England's longest river. Within Massachusetts there are 65 miles of mainstem river habitat that run almost due north/south. The mainstem river habitats are characterized by wide, low gradient streambeds meandering through broad river valleys with extensive flood plains. Soils are rich from a long history of periodic inundation, these floodplains contain a mix of wetlands and uplands, the wide floodplains are utilized primarily for agriculture.

Significant aquatic species include the dwarf wedgemussel, yellow lampmussel and eastern silvery minnow.



The ***Quabbin/Worcester Plateau*** service area is defined by the largest freshwater body in Massachusetts, the Quabbin reservoir. The reservoir is approximately 25,000 acres surrounded by 81,000 acres of primarily forested watershed lands. Major watersheds in this service area include the Quinebaug, Chicopee, Millers, French, Nashua, Sudbury, Assabet, Concord and Blackstone Rivers. These rivers are fairly flat and support a diversity of warmwater species. Wetland plant communities include shallow beaver ponds, naturally acidic ponds and wet meadows. The Worcester Plateau sub area is comprised primarily of gently rolling hills with occasional high monadnocks. Forests are transitional hardwoods with some northern hardwoods. Forested wetlands, such as Red Maple Swamps are common. Surface waters are primarily acidic.

The ***Coastal*** service area is divided into three sub areas based on distinct differences in watershed types, climates, and ocean circulation patterns. Cape Cod acts as a divide between two biogeographic regions, the Gulf of Maine, and the Southern New England – New York Bight systems. The geophysical range of aquatic habitats for

managed diadromous fish and marine finfish and shellfish species includes 16 watersheds with direct hydrographic connections to the coast. The distinct ocean circulation patterns in these regions influence water temperature, water chemistry, and climate on a regional scale. Other factors influencing these regions include coastal hydrology, bathymetry, and tidal fluctuations. Each sub area contains an array of diverse marine, estuarine, and riverine habitat types including salt marshes, barrier beaches, mudflats, riffles, eddy pools, sea grass beds, estuaries, salt ponds, embayments, and rocky shores. There are measurable differences in the ecological functions of habitats within each biogeographic region, including variations in species assemblages, and in the timing and duration of different life history stages of many species.

The *North* service sub area extends from the coastal boundary at the New Hampshire border to Cohasset and includes Plum Island Sound (includes the Great Marsh), Cape Ann, Salem Sound, and Boston Harbor. The entire region is within the Gulf of Maine watershed. All or parts of the Merrimack, Parker, Ipswich, Shawsheen, North Coast, Concord, Mystic, Charles, Neponset, and Weir watersheds are located in this region.

The *Central* service sub area is comprised of the south shore, Cape Cod Bay, and the easternmost extent of Cape Cod. The majority of this region also lies in the Gulf of Maine, except for the eastern extent of Cape Cod. This region contains the entire South Coastal watershed and the northern extent of the Cape Cod watershed that drains into the Gulf of Maine.

The *South* service sub area extends from the Massachusetts / Rhode Island coastal boundary east to Monomoy Island and includes Mount Hope Bay, Buzzards Bay, Nantucket and Vineyard Sounds, the Elizabethan Islands, and the south facing coast of Cape Cod, east to Pleasant Bay. The entire region is located within the Southern New England - New York Bight system. All or parts of the Buzzards Bay, Taunton, Mount Hope Bay, Narragansett Bay, and Islands (Martha's Vineyard and Nantucket) watersheds are located within this region. This region also contains the southern portion of the Cape Cod watershed that drains exclusively into the Southern New England – New York Bight region.

3. Description of the Threats to Aquatic Resources in MA

For the purposes of this prospectus, the term "threats" is broadly defined as a range of direct and indirect adverse effects that alter or modify physical, chemical, or biological environments. As highlighted in the Introduction and Need section, there is a wide range of threats to the aquatic resources of Massachusetts, including the loss or alteration of one-third of the wetland resource areas, the loss of adjacent upland buffers, the loss, degradation, and/or fragmentation of aquatic and wildlife habitats, stormwater discharges and low flow conditions that adversely affect the water quality and fisheries resources in many inland rivers and streams, and the road, rail crossings and other structures that block flow of ocean tides or impede fish and wildlife passage.

DFG's ILFP will assess and prioritize the impacts from various types of anthropogenic threats to coastal and inland aquatic resources within a particular service area. These impacts will be addressed through a compensatory mitigation strategy that is

directed at effectively remediating the threats and/or protecting the aquatic resource and the surrounding landscape from future threats to their ecological sustainability.

A. Coastal Resources

In the coastal/marine environment, threats to aquatic resources can range from temporary disturbances of resident marine life to permanent alterations of benthic habitats. More specifically, threats to species and habitats resulting from common nearshore and in-water construction activities include:

- Dock construction;
- Dredging and dredge material disposal;
- Obstruction of water bodies and streams;
- Pipe and cable installation;
- Shore protection – beach fill, sea walls, bulk heads; and
- Water extraction.

Potential impacts to species and habitat types of concern resulting from these threats include:

- Burial;
- Changes in water flow and sediment transport;
- Changes in water quality;
- Direct mortality;
- Disruption of feeding and/or respiration;
- Disruption of passage or aggregation;
- Disruption of spawning, juvenile settlement and development;
- Entrainment of larvae;
- Replacement or alteration of habitat by structures;
- Unnatural conversion of one habitat type to another;
- Resuspension of sediments and contaminants; and
- Shading.

B. Inland Resources

Land use in the Commonwealth, from intensive agriculture in the post-colonial period, to heavy industrialization, to today's continued suburbanization, has negatively impacted the great majority of Massachusetts freshwater ecosystems. According to a recent report from the United States Geologic Survey (USGS) that examined indicators of stream and freshwater habitat degradation:

"Massachusetts streams and stream basins have been subjected to a wide variety of human alterations since colonial times. These alterations include water withdrawals, treated wastewater discharges, construction of onsite septic systems and dams, forest clearing, and urbanization—all of which have the potential to affect streamflow regimes, water quality, and habitat integrity for fish and other aquatic biota" (Weiskel et al., 2009). *See Weiskel, P.K., Brandt, S.L., DeSimone, L.A., Ostiguy, L.J., and Archfield, S.A., 2010, Indicators of streamflow alteration, habitat fragmentation, impervious cover, and water*

quality for Massachusetts stream basins: U.S. Geological Survey Scientific Investigations Report 2009–5272, 70 p., plus CD–ROM. The report identifies impervious cover, water withdrawals, and dams and other barriers as major stressors to freshwater ecosystems. The authors noted these impacts are widespread; for example, "about 18 percent of Massachusetts subbasins and contributing areas are highly developed, with a local impervious cover greater than 16 percent" (Weiskel et al., 2009).

Subsequent USGS reports found both water withdrawals and impervious cover to be tightly correlated with stream degradation as measured by fish diversity and fish type. Specifically, a 2010 scientific investigation of fish assemblages in small- to medium-sized Massachusetts streams by the USGS, in cooperation with the MassDEP, DCR and DFG, found that the amount of flow alteration and impervious surface are strongly associated with the degree of alterations to fish community abundance and species diversity in these streams. See *Indicators of Streamflow Alteration, Habitat Fragmentation, Impervious Cover, and Water Quality for Massachusetts Stream Basins*, U.S. Geological Survey Report No. 2009-5272 (2010), 70pp., Appendices. Similarly, a 2011 USGS report found that "as percent impervious cover and an indicator of percent alteration of August median flow from groundwater withdrawals increase, the relative abundance and species richness of fluvial fish decrease" (Armstrong et al., 2011).[i] *See Armstrong, D.S., Richards, T.A., and Levin, S.B., 2011, Factors influencing riverine fish assemblages in Massachusetts: U.S. Geological Survey Scientific-Investigations Report 2011–5193, 58p.*

Statewide water quality sampling provides another measure of threats to freshwater ecosystems. The USGS' review of the Massachusetts Department of Environmental Protection's stream assessments found that in 2002, "more than 50 percent of the assessed stream miles were considered impaired" (Weiskel et al., 2009). Impairment is due to a wide range of threats, many of which can be categorized as non-point source pollution, which itself is exacerbated by loss of buffer zones, increased impervious effective area, and development of sensitive lands such as headwaters and riparian corridors.

Aquatic ecosystem barriers such as dams, culverts, and dikes fragment these habitats and interrupt essential ecosystems processes such as the transfer of nutrients and passage of aquatic species. Massachusetts has approximately 3,000 dams and 30,000 culverts. Most, if not all, of the dams present a barrier to uninterrupted fish and other aquatic organism passage, degrade water quality, and alter native communities. At least 50% of the 30,000 culverts, based on inventories conducted by the Massachusetts Division of Ecological Restoration and partners, are undersized and found to be a significant barrier to aquatic species passage.

Climate change is poised to continue to degrade habitats through altered hydrologic regimes, increased temperatures, and incursions of new invasive species. Climate scientists expect that warmer and wetter conditions in the Northeast will cause more high-flow events (flooding) in winter, earlier peak flows in spring, and more prolonged low-flow periods in summer. These changes, combined with an increase in water temperatures, are expected to diminish cold-water refugia critical to species such as brook trout (Frumhoff et al., 2007).[ii] *See Frumhoff, P.C., J.J. McCarthy, J.M. Melillo,*

S.C. Moser, and D.J. Wuebbles. 2007. Confronting Climate Change in the U.S. Northeast: Science, Impacts, and Solutions. Synthesis report of the Northeast Climate Impacts Assessment (NECIA). Cambridge, MA: Union of Concerned Scientists (UCS).

As Massachusetts continues to be developed, with growth concentrated in areas such as the southeast coast and metro-west (portions of the Coastal and Worcester plateau bio-regions), we will continue to see habitat loss and stream degradation. Climate-associated threats will likely magnify current impacts, further stressing Massachusetts' freshwater ecosystems.

As reflected in our proposed service areas and compensation planning framework, DFG's ILFP will be based on an assessment of broadly defined threats and stressors to aquatic resources on the scale of watersheds and larger biogeographic regions. This approach includes identifying and addressing upland sources and conditions that threaten the ecological viability of aquatic resources.

4. Historic Aquatic Resource Loss and Current Aquatic Resource Conditions

A. Historic Aquatic Resource Loss

Since the European settlement began nearly four centuries ago, Massachusetts has experienced a series of changes caused by human activities that have eliminated, altered or threatened the existence or quality of inland and coastal aquatic resources in the state. As highlighted above, depending on the time in history and the geographic area, aquatic resources across the state have been, to differing degrees, used, impacted or otherwise affected by agricultural activities, industrialization, the development of infrastructure (such as roads and highways, dams, bridges and culverts), and sprawl caused by the establishment of cities, towns and suburban residential and commercial development. These activities have caused habitat loss and fragmentation, alterations to hydrologic resources, degradation of water quality from point and non-point sources of pollution, including nutrient enrichment, and the spread of invasive species and plants – all of which negatively impact aquatic resources directly and indirectly.

More specifically, one-third of wetlands in Massachusetts have been lost to filling and alteration. Thousands of acres of coastal marshes are impacted by road and rail crossings that block flow of ocean tides or impede fish and wildlife passage. A growing number of rivers and streams, especially in eastern Massachusetts are impacted by low flow. Urban sprawl and development pose a continued and growing threat to river and wetland health. Over 3,000 dams fragment and degrade our rivers and there are an estimated 30,000 culverts statewide. Finally, climate change is expected to further stress the ecological integrity and health of the Commonwealth's aquatic resources and habitats.

For example, Category II ACOE permitted projects alone have resulted in over 15,000 square feet of impacts to coastal waters off Massachusetts since 2008. The table below breaks down the impacts by habitat type.

Summary of Category II ACOE Permit Impacts since 2008 (in sq ft)

Coastal Service Area	Habitat type	Total Impact (ft^2)
Central	Mudflat	68
	Salt marsh	125
Central Total		193
North	Mudflat	1507
	Open water	3782.25
North Total		5289.25
South	Mudflat	300
	Open water	9026
	Submerged Aquatic Vegetation	425.5
South Total		9751.5
Grand Total		15233.75

Moreover, the situation in Massachusetts is representative of a growing national threat to aquatic resources. According to a recent US Fish and Wildlife report, the loss rate of intertidal emergent wetland increased to three times the previous loss rate between 1998 and 2004. The majority of these losses (83 percent) were to deepwater bay bottoms or open ocean habitats. See Dahl, T.E. 2011. *Status and trends of wetlands in the conterminous United States 2004 to 2009*. U.S. Department of the Interior; Fish and Wildlife Service, Washington, D.C. ,108 pp.

The range and extent of historic aquatic resource loss in Massachusetts underscores the added value that a state-wide ILFP would provide toward achieving the goals and objectives for protecting against and reducing the cumulative loss of aquatic resources in the state, as identified below. DFG intends to provide a more complete analysis of the historic aquatic resource loss in Massachusetts, with reference to the identified service areas, in the program instrument.

B. Current Aquatic Resource Conditions

DFG has an array of existing tools available to it that are relevant to assessing current aquatic resource conditions in Massachusetts, including DER's GIS *Restoration Potential Model*; BioMap2; the UMass-Amherst/MassDEP/Coastal Zone Management Wetland Monitoring and Assessment method utilizing the Conservation Assessment and Prioritization System ("CAPS") and Site Level Assessments, and the MassDEP Recovery Potential Screening Tool. In addition to drawing on these tools, as appropriate, DFG will consider other available sources of information such as the United States Fish and Wildlife Service's National Wetlands Inventory ("NWI") Maps, the National Hydrology Dataset "NHD"), The Nature Conservancy's Active River Area ("ARA") model, and hydric soils data from the Natural Resources Conservation Service ("NRCS").

The goal for DFG's program instrument will be to identify the areas of the state that are most likely currently capable of supporting aquatic resource functions and

habitats, as well as buffers and upland necessary to protect aquatic resources from degradation. DFG's assessment of current aquatic resource conditions will, in turn, play an important role in determining where to implement appropriate mitigation projects in each service area.

5. Aquatic Resource Goals and Objectives

Overall, DFG seeks to achieve the goals identified in Section IV.1 above for its ILFP. The more specific aquatic resource goals and objectives for the compensation planning framework are:

(1) substantially increase the scope and quality of restoration and protection of aquatic resources or related buffers and uplands that are typically addressed by permittee-responsible mitigation and as a supplement to any mitigation otherwise required under the state Wetlands Protection Act and state Clean Waters Act;

(2) effectively address identified environmental priorities relevant to the protection of aquatic resources and other compatible conservation and management initiatives within each service area; and

(3) reduce the extent of cumulative adverse impacts to aquatic resources in Massachusetts.

6. Prioritization Strategy

Every proposed ILFP mitigation project will first be evaluated by DFG in accordance with the compensation planning framework described in this prospectus and established in more detail in the program instrument. As a general matter, DFG expects to apply the following criteria when evaluating and selecting its proposed mitigation projects:

1. <u>The Project's Likelihood of Success</u>

   Each potential mitigation projects will be evaluated by DFG for its likelihood of success. DFG's intention is to implement only those mitigation projects that DFG predicts will have a high likelihood of success. Because DFG's land preservation projects will result in the permanent protection of aquatic resources/habitats and/or upland buffers, their successful outcome is thereby assured. The restoration of inland and coastal aquatic resources can be more challenging, and will require a site-specific evaluation of the hydrology, soils, flora, fauna, predicted sea level rise, and other conditions that are necessary for the proper development of the target aquatic resource/habitat. The extent of any potential threats from invasive species will also need to evaluated, and if a significant risk exists, shown to be manageable.

2. <u>The Project's Ability to Achieve Multiple Mitigation Objectives</u>

   Potential mitigation projects will be evaluated on their ability to address more than one mitigation objective and outcome. These may include restoring or

improving more than one ecological function or systems, and/or protection of high quality resources/habitats for state-listed species protected under MESA, important wildlife habitats identified as defined by MassDEP's important habitat maps, and other general wildlife habitats.

3. Whether the Project will Result in Mitigation in the same Service Area

   Potential mitigation projects will be evaluated in terms of whether they will be implemented in the same service area as the permitted aquatic resource impact(s). Given the geographic extent of our proposed service areas, DFG anticipates prioritizing mitigation projects that occur in the same service area as the permitted aquatic resource impact(s). The ACOE, in consultation with the IRT, must approve any mitigation project proposed to be implemented in a different service area.

4. The Project's Support of or Compatibility with Broader Conservation or Management Initiatives and the surrounding Landscape

   Potential mitigation projects will be evaluated in terms of whether their location, scope and objectives support or are compatible with broader conservation or management initiatives of DFG, the ACOE, one or more members of the IRT, or other natural resource conservation or management entities that work with DFG. Examples include projects that advance the objectives of the Commonwealth's Sustainable Water Management Initiative, DFG's land protection program, the Division of Fisheries and Wildlife's state wildlife action plan and state-listed species conservation programs, the Division of Ecological Restoration's priority inland and coastal restoration projects, the Division of Marine Fisheries coastal and ocean resource restoration and protection programs, and projects that contribute to the recovery and delisting of impaired waters using the MassDEP Recovery Potential Model .

   The projects will also be evaluated on the extent to which their location complement adjacent land uses, enhance the ecological functions of existing natural resources, address a priority environmental need of the particular service area, reduce habitat fragmentation, and establish riparian and other wildlife corridors and buffers that prevent degradation of aquatic resources.

5. Cost of Implementing and Maintaining the Project

   The cost of implementing and maintaining a mitigation project will be evaluated, taking into account any costs differences arising out of the project's geographic location (e.g., the cost of preserving land in western MA versus Cape Cod), as well as the higher costs associated with constructing and maintaining restoration projects. DFG will weigh the costs against the predicted ecological benefits, including magnitude, quality and duration of such benefits.

DFG also intends to use ILFP funds in conjunction with DFG's other available financial resources and/or using the contributions of outside funding partners. However, no ILFP funds will be used as non-federal match for federal grants or federal programs.

7. Public and Private Stakeholder Involvement

As discussed below in the descriptions of the restoration and land preservation components of DFG's proposed ILFP, DFG and its Divisions already have a range of existing partnerships or working relationships with other federal and state agencies, non-profit natural resource management entities, and municipalities in several areas and contexts that are germane to ILFP objectives and activities. DFG intends to optimize the success of its ILFP by strengthening its existing partnerships and working relationships. This effort will include proactively reaching out to relevant public and private stakeholders for their input on the framework for and implementation of the ILFP, and/or because such stakeholders may have an interest in participating in the ILFP, either as a source of regular projects that require ACOE permits and are suitable for in-lieu fee mitigation, or because of their experience and resources in identifying and providing comment or other assistance on potential mitigation projects.

8. The Restoration Component of DFG's ILFP

As summarized below, DFG's ILFP envisions directing a significant portion of the in-lieu fees toward the restoration of inland and coastal aquatic resources.

A. Coastal/Marine Aquatic Resources

As highlighted in the Sponsor Qualifications section, DMF is the program sponsor for the ILFP that addresses impacts to aquatic habitats for managed diadromous fish and marine finfish and shellfish species in Massachusetts. In 2010 DMF, with the approval of the ACOE and the IRT overseeing its ILFP, established an operational approach that obligates DMF to implement a mitigation project once it accumulates a threshold amount of $200,000 or by December 2012, whichever occurs first. This approach is to ensure that DMF is implementing reasonably timely, but meaningful compensatory mitigation projects that provide an enhanced benefit to aquatic resources. As of July 27, 2012, DMF has collected over $193,432.50, $137,717.50 of which is associated with permitted project impacts to open water habitat. In addition, DMF has received a grant from *MassBays* to partially fund a staff person who is investigating one or more potential mitigation projects to be implemented by the ILFP once the threshold is met or by December, 2012. The work of this DMF person will also assist in the development of a process for selecting coastal mitigation projects under DFG's statewide ILFP proposed in this prospectus. The resulting mitigation project implementation experience, together with the planning work arising out of the *MassBays* grant, will strengthen the foundation for this component of DFG's ILFP on a going forward basis.

DFG and the ACOE entered into their MOU authorizing DMF to be the program sponsor for the existing coastal ILFP prior to the adoption of the ACOE's 2008 mitigation rule. DMF thereafter requested and received an extension from the ACOE to

conform its existing ILFP to the full scope of requirements in the 2008 rule, including the development of a progam instrument, by June 9, 2013. DFG's goal is to have an approved program instrument for a state-wide ILFP in place prior to the above date, which would obviate the need for DMF to develop a separate program instrument for its ILFP.

In addition to DMF, DER also has extensive experience restoring streams and tidal wetlands within coastal watersheds across the state. For this reason, DMF and DER would co-lead administration of the restoration component of DFG's ILFP for mitigating impacts to coastal aquatic habitats, including those supporting diadromous fish and marine finfish and shellfish species.

DMF's existing ILFP tracks project impacts by location (i.e., their latitude and longitude; whether they occur in the north, central or south sub regions of the Coastal service area, and by the type of aquatic habitat impacted. The categories that define impacted habitats eligible under the coastal/marine component of DFG's ILFP include:

- Open water (water column and subtidal impacts);
- Salt marsh;
- Submerged Aquatic Vegetation;
- Streams (diadromous passage and spawning); and
- Mud flat (intertidal impacts).

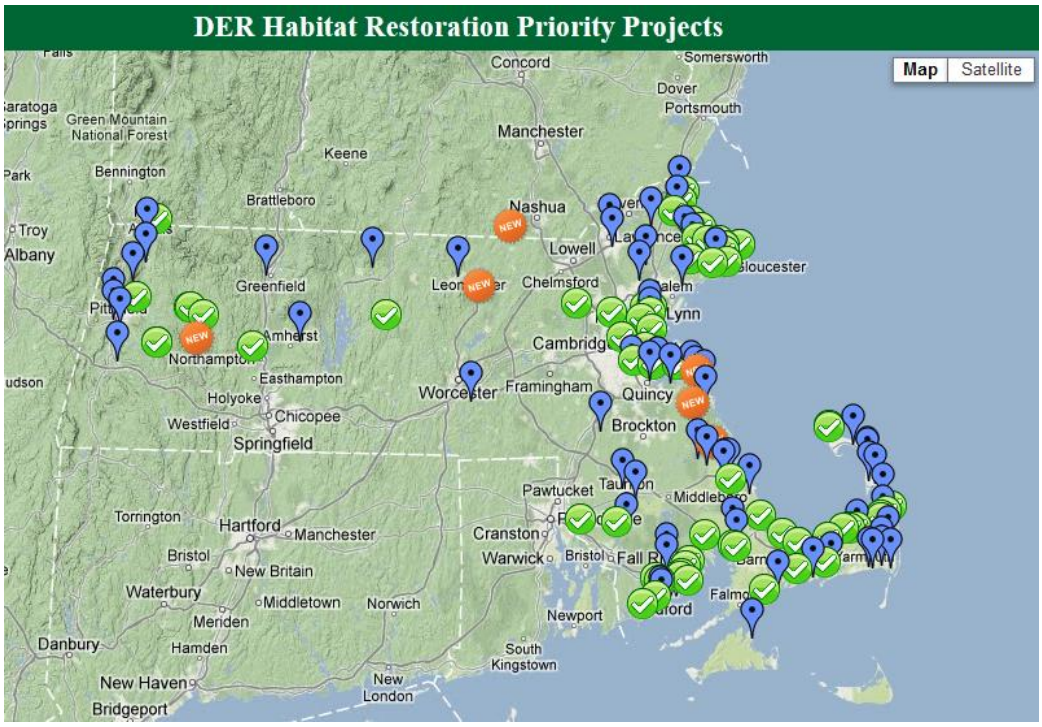
This tracking approach is critical to determining the most effective use of the in-lieu fees and to ensure that the "no net loss" mitigation standard in the 2008 rule is achieved. DMF and DER, in consultation with the IRT, would establish an expanded list of aquatic habitat impacts by type with their corresponding mitigation ratios, and ensure that the compensatory mitigation projects would occur in the same service area as the permitted aquatic habitat impact(s) unless the ACOE, in consultation with the IRT, approves the use of the funds in an adjacent service area. DMF and DER intend to seek input from and share information with the ACOE, the IRT and other relevant regulatory or mitigation authorities (e.g., the state and federal Natural Resource Damages trustees) regarding the most appropriate mitigation ratio for the corresponding habitat impacts. The type and location of habitats impacted are, in turn, important factors in identifying and prioritizing compensatory mitigation projects, as discussed below.

DMF and DER have extensive experience designing and implementing mitigation and pro-active restoration projects in Massachusetts coastal watersheds and marine environments. For this reason, we envision that DMF and DER would have the first option of implementing a restoration mitigation project to meet the identified restoration priorities and objectives, depending on work priorities and the availability of staff. Alternatively, DMF and DER would use a competitive RFP process as a means of identifying, prioritizing, and selecting coastal restoration projects to be funded by the in-lieu fees. DMF has experience with a similar mitigation project selection process implemented by the New Bedford Harbor Trustees and the Atlantic Coastal Fish Habitat Partnership. As highlighted in **Appendix A**, DER also has extensive experience in restoration planning and a longstanding priority project program that has defined criteria for project selection based on a suite of factors that improve project implementation success. These models use an RFP process as a means of soliciting input on habitat

restoration priorities and projects in a given area. The resulting proposals are then reviewed and graded by a review panel for their ability to effectively achieve the identified restoration priorities and objectives. Both of the above entities have demonstrated success using this approach, and consistent with DMF's existing ILFP, we believe it will work well for DFG's expanded coastal ILFP component.

As envisioned under the 2008 rule, all DFG coastal restoration mitigation projects – whether they are proposed to be implemented by DMF or DER or identified and implemented by a third party through an RFR process - would be subject to review by the IRT and approval by the ACOE.

B. Inland Aquatic Resources



Recently completed DER restoration projects have green checks. Active DER restoration projects have blue circles and projects accepted in 2012 are labeled as new.

DER would play the lead role in administering the inland restoration component of DFG's ILFP, drawing on the overlapping expertise in DMF, DFW, and MassDEP as needed. DER and its project partners have established watershed-based restoration plans as well as state-wide planning tools such as the GIS *Restoration Potential Model*. DER also envisions using, as appropriate, the UMass-Amherst/MassDEP/Coastal Zone Management Wetland Monitoring and Assessment method utilizing the Conservation Assessment and Prioritization System ("CAPS") and Site Level Assessments, and the MassDEP Recovery Potential Screening Tool.

DER already has a portfolio of 70+ physical restoration projects that are potentially eligible for funding from in-lieu fees, depending on the willingness of the project partners and the conditions of already secured funding sources for these projects.

DFW also implements a smaller number of inland waters restoration projects. This existing range of restoration plans, partners and projects – combined with information from other state agencies (e.g., MassDEP's list of impaired waters and wetlands assessment and loss data) – would be used to document the loss of and threats to aquatic resources within each inland service area. It would also serve as the basis for DFG's inland aquatic resource protection goals and prioritization strategy for selecting and implementing compensatory mitigation activities, as discussed below.

In recognition of DER's extensive experience and project portfolio, DFG is proposing an approach that would give active restoration projects by DER or DFW first priority for funding under the ILFP for associated inland impacts. If there were no suitable DER or DFW projects that furthered the restoration goals and prioritization strategy within a particular service area, DER would solicit restoration project proposals through a competitive RFP process. Under this RFP approach, DER would issue a solicitation for proposals only when a sufficient amount of in-lieu fees had been accrued (e.g., $250,000) so that a project could be completed from start to finish without the need to identify and obtain additional funding sources. These "shovel-ready" projects would also be prioritized to ensure that the ones with the greatest restoration benefits would be funded and implemented first. DFG acknowledges that the funds for a particular mitigation project must be obligated within three (3) years of receipt of the corresponding in-lieu fees, unless the ACOE grants an extension of time.

As with its coastal restoration mitigation projects, all DFG inland projects – whether they are proposed to be implemented by DER or DFW or identified and implemented by a third party through an RFR process - would be subject to review by the IRT and approval by the ACOE.

9. The Land Preservation Component of DFG's ILFP

The 2008 rule states that compensatory mitigation needs can be met through the methods of restoration, enhancement, establishment (i.e., creation), and in certain circumstances preservation. Preservation, in turn, is defined in the 2008 rule as the removal of a threat to, or preventing the decline of, aquatic resources by an action in or near the aquatic resources and includes the protection and maintenance of such resources through appropriate physical and legal mechanisms. More specifically, protection of aquatic resources through land preservation is no longer considered a last resort option and is expressly allowed under the 2008 rule when the five criteria set forth therein are met. These criteria include a determination that the resource to be preserved contributes significantly to the ecological sustainability of the watershed and is under threat of destruction or adverse modifications, and the preserved site will be permanently protected through appropriate real estate or other legal instruments (e.g., an easement or title transfer to a state resource agency or land trust).

Moreover, the 2008 rule authorizes the restoration, establishment, enhancement, preservation and maintenance of riparian areas and/or buffers around aquatic resources where necessary to ensure the long-term viability of those resources. The rule also recognizes that buffers may also provide habitat or corridors necessary for the ecological functioning of aquatic resources, and that compensatory mitigation credits will be provided for those buffers.

Consistent with the 2008 rule, the In-Lieu Fee Mitigation Guidance cites language from Oregon's ILFP that proposes "preservation or improvements of riparian areas, buffers and uplands if the resources in these areas are essential to maintain the ecological viability of a water of the U.S." See *In-Lieu Fee Mitigation: Model Instrument Language and Resources, Environmental Law Institute, (December 2009), p.52*. As highlighted in the *Description of the Threats to Inland Aquatic Resources in MA* section of this prospectus (Section IV.3.B., p.11), two recent USGS reports show how the capacity of our rivers and streams to support fisheries is directly threatened by the construction of impervious surfaces in riparian and upland areas. Prioritizing and preserving these riparian and/or upland areas within the context of a watershed approach is an effective means of achieving the mitigation objectives of the 2008 rule.

For the above reasons, DFG is proposing to use land preservation as the *predominant* component of its ILFP compensatory mitigation strategy. DFG and DFW, through their jointly administered land protection program, would play the leading role in implementing this central feature of DFG's ILFP using a scientific approach based on the latest information, such as BioMap 2, as discussed in more detail below.

As noted in the Sponsor Qualifications section, one of DFW's important responsibilities under the law is to administer MESA. DFW has years of experience in evaluating and overseeing compensatory mitigation to offset impacts of projects and activities that occur in priority habitat of state-listed species, including in wetland resource areas that serve as habitat for such species (i.e., estimated habitat, a subset of priority habitat). When DFW determines that a project or activity will cause a "take" of a state-listed species (which can result from the alteration of priority habitat), it can only be authorized under the MESA through the issuance of a conservation and management permit that provides for compensatory mitigation that results in a long term net benefit to state-listed species as a whole. A common means of providing the required net benefit mitigation is through the permanent preservation of land that serves as habitat for the affected state-listed species. Under certain circumstances, MESA permittees are allowed to make a funding contribution to meet the net benefit mitigation standard, and subject to DFW's oversight, these funds are used to preserve off-site habitat for the affected state-listed species.

In addition, DFG and DFW's relevant experience includes establishing a partnership with The Nature Conservancy ("TNC") that facilitates enhanced off-site compensatory mitigation arising out of DFW's issuance of conservation and management permits authorizing the take of the Eastern Box Turtle ("EBT"), a state-listed species of special concern, pursuant to the MESA regulations. Similar to the ACOE's ILFP, the off-site mitigation funding contributions provided by these MESA permittees is held and aggregated by TNC and then used by TNC to acquire and permanently protect larger, contiguous areas of quality EBT habitat. To date, TNC has used MESA off-site mitigation funding for this purpose to become the holder of a conservation restriction that permanently preserves three contiguous parcels of land totaling 91.7 acres in Middleborough, MA. Moreover, DFG and DFW already has in place existing criteria and procedures that they jointly developed with TNC for identifying the highest quality land preservation sites, using the best available science and latest GIS tools. This

compensatory mitigation strategy provides more value from a biodiversity standpoint than achieved by a project-by-project mitigation approach.

In October, 2010 the MESA regulations were amended to authorize DFW to develop a conservation plan for a species of special concern whenever DFW determines that such a plan will be an effective means of ensuring the long term viability and protection of the species in the Commonwealth. Such plans call for the identification of "conservation protection zones" within the state that, in DFW's view, are important to ensuring the long term viability and protection of the species. The revised MESA regulations also provide more permitting flexibility for takes that occur outside of the conservation protection zones, including allowing the net benefit standard to be met by making off-site funding contributions to permanently preserve habitat within the conservation protection zones.

Earlier this year, DFW issued a proposed Conservation Plan for the EBT, which was subject to a public comment period this summer. DFW expects to put the final EBT Conservation Plan in place during 2012, and as a result, anticipates an increase in mitigation funding that will be aggregated and directed toward enhanced, off-site preservation of land. The above DFW MESA mitigation initiatives would complement and work in parallel to DFG's ILFP. In short, DFW's compensatory mitigation approach and implementation experience under MESA is readily transferrable to the ILFP framework and objectives.

Apart from MESA, DFG's land protection program and DFW have a proven record of land acquisition, including an ability to leverage land protection dollars through relationships with NGO partners. Approximately 190,000 acres of land have been permanently preserved through DFG's land protection program. In 2010 alone, DFG preserved approximately 6,000 acres. DFG uses a detailed land acquisition process to identify potential parcels that includes the use of best available science and mapping technology, landscape context, management considerations and relative value. The time-tested process was specifically developed to be flexible and to adapt to changing land preservation priorities and needs.

As part of our ILFP, DFG's land team would work with the IRT to develop an agreed upon methodology to indentify and prioritize parcels within the service areas. The land team would develop procedures that would integrate ILF acquisitions with other mitigation land protection and ongoing habitat protection to maximize the conservation benefit. DFG anticipates that little adjustment would be needed to adapt our existing land acquisition process to fit the objectives of an ILFP. Indeed, avoiding duplication of effort will result in the ILFP funds being used in a more efficient and effective manner.

More specifically, DFG envisions this component of our ILFP to have the following attributes:

- identification of land preservation objectives that are clearly defined and consistent with the five criteria in the 2008 rule (e.g., targeting high quality riparian areas, resources that are under threat of destruction or degradation, specific natural communities, biological diversity);

- evaluation of specific parcels using the best scientific evidence and analysis available;

- implementation of a conservation strategy that arises out of big picture, holistic conservation priorities and goals, similar to the DFW's partnership with TNC and the EBT Conservation Plan;

- evaluation of potential projects within a larger landscape/watershed context, including assessing the extent to which a project contributes to the ecological sustainability of a watershed;

- use of additional evaluative criteria that provides for the analysis of the relative value of preserving particular parcels, public use and feasibility, etc;

- use of a land preservation strategy that seeks partnerships with highly qualified land conservation entities and other experienced NGOs; and

- use of a decision making process that is transparent, subject to oversight by the IRT, and based on input from other relevant stakeholders.

The DFG land team, in consultation with the IRT, would develop criteria to be used to select geographic subareas in the service areas within which land or interests in land would be acquired to meet the ACOE's compensatory mitigation requirements associated with impacts to aquatic resources. The DFG land team, in consultation with the IRT, would also identify the range of land protection mechanisms that satisfy ILFP requirements (e.g., fee acquisition by DFG, conservation restrictions held by DFG or a qualified third party).

In furtherance of the above objectives, DFG's ILFP would apply a number of existing mapping and assessment tools at our disposal such as *Biomap 2*, *Living Waters* and other specific GIS tools used in our focus area planning process. In that regard, DFG has already established focus areas by major watersheds based on the best scientific and mapping information available. In addition, DFW has completed a new mapping tool that provides the delineation of MESA-regulated habitats on a species-by-species basis. The latter will serve as a flexible and powerful tool that:

1. helps land protection plans focus on the actual habitat of rare species;

2. enables a more accurate assessment of the levels and kinds of protection that already exist for state-listed species habitats; and

3. helps identify which species are most in need of further habitat protection.

DFG would use these and other methods to develop a comprehensive land preservation framework that will maximize the use of ILFP funds for the protection of habitat and buffers for aquatic resource-dependent species.

Beyond the development of this land preservation framework, DFG believes the integration of an ILFP with our current land ownership/protection program will only

increase the opportunities for and the scope of land preservation. Thus, the integration of a land preservation program into a larger ILFP service area context will benefit both the reach and success of the ILFP and DFG's ongoing land protection efforts.

10. Monitoring and Long-Term Management

A. Monitoring of Mitigation Projects

Each mitigation project approved by DFG's ILFP program sponsor will contain performance standards to be used to assess whether the project is achieving its objectives (e.g., developing into the desired aquatic resource type; providing the expected ecological functions; resulting in the preservation of the required acreage of land). To that end, the mitigation project plan will also have a monitoring period that is sufficient to demonstrate that the project has met the identified performance standards. Consistent with the 2008 rule, projects will be monitored for a minimum of five years (ten years for forested wetlands), unless DFG, in consultation with the ACOE and the IRT, reduces or waives the remaining monitoring period based upon its determination that the project has met its performance standards. Conversely, DFG may extend the monitoring based upon its determination that the project has not met or is not on track to meet its performance standards. In such cases, DFG may implement or require an approved third party to implement adaptive management activities and/or corrective actions deemed necessary by DFG to meet the performance standards in accordance with a revised timeframe.

B. Ownership Arrangements and Long-Term Management of Mitigation Projects

The 2008 rule provides that the program instrument must include the following information:

1. identify the party responsible for ownership and all long-term protection and management of the mitigation projects;

2. include a description of long-term management needs, annual cost estimates for these needs, and identify the funding mechanism that will be used to meet those needs; and

3. specify what long-term financing mechanisms will be used, such as "non-wasting endowments," trusts, contractual arrangements with future responsible parties, and other appropriate financial instruments.

DFG will ensure that a long-term protection and management plan is developed and implemented for each ILFP mitigation project. Mitigation project sites will be managed in accordance with the long-term management plan, which will be a component of the plan or report associated with the mitigation project.

As discussed under the land preservation component of our ILFP, DFG will utilize a range of land protection mechanisms that satisfy ILFP requirements (e.g., fee acquisition by DFG, conservation restrictions held by DFG or a qualified third party) that will result in the permanent protection of these mitigation sites. These land protection mechanisms may also be appropriate for use in other coastal or inland restoration projects implemented under DFG's ILFP. With the approval of the ACOE, DFG may also

transfer ownership or long-term management responsibilities associated with certain mitigation projects to an appropriate non-profit conservation organization, land trust, local government, or other qualified third party entities. In such cases, the long-term management entity would be required to use the related long-term management funds in accordance with terms of the management plan and/or any applicable real estate or other legal instrument.

11. Program Reporting

The 2008 rule requires the program instrument to include reporting protocols addressing four areas:

1. monitoring reports, on a schedule and for a period determined by the project-specific mitigation plan;

2. notification to the ACOE of credit transactions;

3. an annual program report summarizing activity from the program account, addressing both financial and credit accounting; and

4. an annual financial assurances and long-term management funding report.

DFG will submit the annual program report to the ACOE and to the IRT, which will include an accounting, on a statewide and service area basis, of all income, disbursements and interest earned by DFG's ILFP, and the balance of such funds. The annual report will also provide the following information:

1. A report for each mitigation project using the ILFP that includes:

    - the ACOE permit number;

    - the name of the permittee;

    - the date the permit was issued;

    - the town(s) where the permitted activity occurred;

    - a description of the impacts to aquatic resources authorized by the permit, including the amount of the impact;

    - the amount of the in-lieu fee required by the permit; and

    - the date that DFG received the in-lieu fee from the permittee.

2. An accounting of the expenditures for each ongoing mitigation project.

3. The balance of credits advanced and released at the end of the annual reporting period for each service area and for each component of DFG's ILFP (coastal/marine aquatic resources; inland aquatic resources; land preservation), and any changes in the

availability of credits (including any additional credits advanced or released). The status of these credits will be tracked in the Regulatory In-lieu fee and Banking Information Tracking System ("RIBITS") found at http://www.ribits.usace.army.mil.

4. Monitoring reports for each ongoing mitigation project.

5. An evaluation of any ongoing mitigation project that DFG determines is not meeting its mitigation objectives or performance standards, and a corrective action or an adaptive management plan, if needed.

12. Periodic Evaluation of the ILFP

Every five years, DFG will produce, in consultation with the ACOE and the IRT, a status and trends report summarizing the activities and accomplishments of its ILFP during the preceding five years. The report will include an assessment of the extent to which DFG has achieved the goals established in the program instrument for the inland and coastal restoration and land preservation components of its ILFP, and discuss how the mitigation projects implemented under each component during this period helped achieve or made progress toward achieving the ILFP goals. Every ten years or as funds allow, DFG will assess, in consultation with the ACOE, the IRT and other ILFP stakeholders, the effectiveness of the compensation planning framework established in the program instrument.

V. Administration of the ILFP

1. Mitigation Credits

Under the 2008 rule mitigation credits are based on functional assessment units or other suitable metrics of particular resource types such as linear feet or acreage. Consistent with the 2008 rule, DFG's program instrument will propose a higher mitigation ratio for credits to be used to preserve riparian areas, buffers and/or uplands. The cost per unit of DFG's credits will take into account the expected costs associated with restoration, establishment, enhancement, and/or preservation of aquatic resources. Essentially, the in-lieu fee will be based on the cost of implementing permittee-responsible mitigation project. More specifically, the fees may be based on a square foot, acreage, and/or linear foot (for streams) basis, and may vary depending on the geographical location to account for differences in real estate and/or construction costs across the state and between resource types (e.g., coastal, inland). This "full cost accounting" approach will also include, as appropriate, expenses such as project planning and design, construction, land acquisition, legal fees, monitoring, adaptive and/or long-term management activities. DFG will periodically review and, if necessary, adjust the cost basis for its credits.

DFG's program instrument shall specify the initial allocation of advance credits and a draft fee schedule for the credits by service area (including an explanation of the basis for the allocation and fee schedule). DFG's program instrument will address in detail the generation and release of mitigation credits within the context of our

compensation planning framework. Below is a more general description of DFG's approach to mitigation credits for the purpose of this prospectus.

The Generation of Credits

Following the execution of the program instrument, DFG will generate advance credits in each service area based on categories of project types (e.g., restoration of basic categories of coastal and inland aquatic resources such as wetlands, streams and submerged aquatic vegetation; preservation of land containing aquatic resources and upland buffers). The number of advance credits and their allocation to the service areas will be established based on the initial phase of DFG's development of its ILFP, including DFG's identification of mitigation projects plans appropriate for each service area and a determination of the projected funding needed for the planning and implementation of such projects.

DFG's approach to generating credits for specific projects with impacts to marine or diadromous resources (as distinct from advance credits) will likely track DMF's existing ILFP's use of ACOE-approved mitigation ratios that correspond to the identified categories of aquatic habitats (i.e., open water; salt marsh; submerged aquatic vegetation; streams; mud flats). However, DFG will evaluate, in consultation with the IRT, whether any modifications to the above approach may be warranted based on DER's restoration project experience in certain of the above aquatic habitats. The inland aquatic resources component of DFG's ILFP will also draw on DER's programmatic and project experience in determining the appropriate basis for and the number of project-specific credits in this area.

As discussed earlier, the land preservation component of DFG's ILFP will focus on the preservation of riparian areas, buffers and uplands determined to be essential to maintaining the ecological viability of aquatic resources and habitats. The approach to generating project-specific credits in this area will be based on consideration by DFG and DFW of existing agency sources of information and processes used to evaluate, prioritize and determine the ecological and monetary value of potential acquisitions of real estate interests to achieve the identified compensatory mitigation objectives. In situations where the mitigation involves the protection of aquatic or upland habitats of species protected under MESA, DFG will take into account the net benefit performance standard for authorizing a "take" of a state-listed species as well as the related mitigation ratios set forth in the MESA regulations.

A. The Release of Credits

DFG's program instrument will further specify the basis and schedule for releasing the credits allocated by DFG to each service area. This approach will likely tie the release of a specified percentage of credits to the achievement of milestones such as:

- the execution of the program instrument;

- the development of design and implementation plans for mitigation projects;

- the completion of mitigation projects and/or the phased achievement of project mitigation objectives or performance standards; and

- the development of a long-term management plan for mitigation projects, including the establishment of financial assurances, when applicable.

As noted above, DFG will track the actual number of credits available under the ILFP at any given point through RIBITS.

B. The Sale of Credits

At the outset, an ACOE permittee will be responsible for proposing the form of compensatory mitigation that will be required as a condition of the ACOE's permit authorizing the project - either mitigation that the permittee will be responsible for implementing, or by making an in-lieu fee payment to DFG. If the permittee proposes to make an in-lieu fee payment, it must obtain the ACOE's authorization to purchase credits from DFG's ILFP. The ACOE documents its authorization by including a special permit condition setting forth the requirement payment amount. After such actions are taken by the ACOE, the permittee may then make the required in-lieu fee payment to DFG to secure the necessary credits as specified in the ACOE permit.

DFG acknowledges that each ACOE permit that includes a special condition requiring the permittee to purchase credits from DFG's ILFP will include a requirement that DFG certify the transfer of responsibility via a written communication to the permittee and the ACOE. DFG's certification will identify the ACOE permit number and permittee name state the number and resource type of credits that have been sold to the permittee. The certification will also list the resource types and the amount of each resource that is directly or indirectly impacted by the project. DFG will retain a copy of each certificate in the administrative and accounting records for its ILFP program instrument. Credit and debits will be reflected in DFG's annual accounting reports.

DFG further acknowledges that once an ACOE permittee has purchased credits from DFG's ILFP, DFG becomes responsible for fulfilling mitigation requirements associated with those credits, and that this responsibility will remain with DFG until the mitigation project for which credits were purchased is closed or transferred to a qualified third party approved by the ACOE.

2. The Program Account

The 2008 rule requires the establishment of an in-lieu fee program account and the implementation of related accounting procedures. More specifically, the program account is an account that is established by the program sponsor to track the in-lieu fees accepted and disbursed by the program sponsor. The program account must track funds accepted from ACOE permittees separately from other entities and for other purposes (e.g., separate from grant-funded projects). Any interest accruing from the program account must remain in the account for the ILFP to use for the purposes of providing compensatory mitigation. The 2008 rule requires that in-lieu fee funds deposited in the program account can only be used specifically for the selection, design, acquisition, implementation, and management of in-lieu fee compensatory mitigation projects. As

discussed in more detail in Section V.C.3 below, the 2008 rule also allows a percentage of the program account funds to be used for administrative costs and gives the ACOE the discretion to determine the appropriate amount.

Based on consultation with the State Office of Comptroller ("OSC"), DFG proposes to establish an expendable trust pursuant to OSC's regulations at 801 CMR 50.00 to serve as the single DFG ILFP account. An expendable trust is a dedicated account of the Commonwealth, established on the Massachusetts Management Accounting and Reporting System ("MMARS") and with the State Treasurer, into which are deposited monies held by the Commonwealth or a state agency such as DFG. The monies deposited therein may be expended only in accordance with the terms of the expendable trust. Expendable trusts require the approval of both the relevant Secretariat and the Executive Office of Administration and Finance. The financial accounting and reporting procedures associated with expendable trusts are governed by generally accepted accounting principles as promulgated for governments by the Governmental Accounting Standards Board.

DFG believes that this commonly used state expendable trust mechanism will satisfy the program account requirements in the 2008 rule. The establishment of an expendable trust for DFG's ILFP will allow the in-lieu fee funds to be deposited and held in an account of state government that is separate from the Commonwealth's general fund and not subject to appropriation by the state legislature. The administration of the expendable trust is subject to generally accepted governmental accounting procedures, and OSC's requirements are flexible enough to allow DFG to use any interest accrued in the expendable trust for ILFP purposes.

DMF's existing ILFP started off slowly in terms of the amount of monies collected, both because it does not apply to the larger projects requiring an individual permit from the ACOE and because it had not yet identified the mechanism(s) for accepting payments from other state agencies and from DFG's own Office of Fishing and Boating Access ("OFBA"). OSC has identified the availability of an internal encumbrance ("IE") payment mechanism that will allow DFG to process inter-agency transfers of in-lieu fee payments into the ILFP expendable trust (e.g., by other state agencies such as MassHighway). Because IE authorization is tied to a specific state account, the above described DFG ILFP expendable trust will need to be established in accordance with the review and approval process in 801 CMR 50.00 before the IE is put in place. OSC is also exploring whether there is an available mechanism for DFG to accept intra-agency in-lieu fee payments directly from OFBA. In the interim, and on a going forward basis if OSC determines there is no such mechanism, OFBA's contract with its project consultant or construction contractor will require one of these parties, as applicable, to pay the required in-lieu payment directly to the ILFP expendable trust.

In addition, DMF would transfer all existing EFH ILFP funds into the new expendable trust to be established for the DFG-wide ILFP. DFG and its divisions have the capacity to segregate, track and account for the use of the in-lieu fee payments as required by the 2008 rule.

3. Administrative Overhead Set-aside

The 2008 rule allows the in-lieu fees deposited in the program account to be used for the "selection, design, acquisition, implementation and management" of projects. In addition, a "small percentage" of the funds can be used for "administrative costs." As allowed under the 2008 rule, DFG will need to use a percentage of the in-lieu fees, as agreed upon with the ACOE, to cover DFG's costs for administering the ILFP. DFG intends to specify a percentage administrative set-aside in the program instrument that strikes the right balance between being sufficient to cover our administrative costs and not creating a disincentive for ACOE permittees to use the ILFP option.

Appendix A

Restoration Planning Information

Planning tools to assist in ILFP implementation

The Division of Ecological Restoration has a range of statewide restoration planning models and tools as well as more geographic specific restoration plans that will be incorporated into DFG's ILFP.

Statewide Planning Models and Tools

DER's Restoration Potential Model

A GIS-based analytical framework that assesses the environmental impact of dams on aquatic resources from their contributions to environmental degradation.
http://www.openmass.org/dfwele/der/freshwater/riverrestore/riverrestore.htm

USGS, Indicators of Streamflow Alteration, Habitat Fragmentation, Impervious Cover, and Water Quality for Massachusetts Stream Basins
http://pubs.usgs.gov/sir/2009/5272/

UMass and partners: CAPS: Conservation Assessment and Prioritization System
http://www.umass.edu/landeco/research/caps/caps.html

EPA and DEP's Recovery Potential Screening, *Tools for Comparing Impaired Waters Restorability* http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/recovery/index.cfm

Restoration Plans

Great Marsh Tidal Crossing Inventory and Assessment

• Produced by the Parker River Clean Water Association with funding provided by the Mass Bays Program and MA CZM, completed: 1996 (with 1997 addendum)

This project identified 147 tidal crossings within the Great Marsh coastal region from Cape Ann to New Hampshire and assessed the impact of restrictions on tidal flows. The document provides one-page summaries for 25 sites that were deemed to be most restrictive. A 1997 addendum identifies an additional 22 sites in the study area. Several sites in the inventory have been restored and others are currently being studied for project feasibility.

Gloucester River and Stream Habitat Restoration Report

• Produced by the Massachusetts Audubon Society with funding provided by the Massachusetts Riverways Programs, completed: 2002

Staff from the MAS North Shore region worked with Gloucester officials and residents to identify, assess, and prioritize degraded aquatic resources within the city limits. 225 sites were identified. Potential restoration actions include fill removal, dam removal, buffer enhancement, stream daylighting, invasive species control, and stormwater treatment. The report provides detailed maps, sketches, photos, and descriptions of all identified restoration opportunities

North Shore Atlas of Tidally Restricted Marshes

• Produced by the Massachusetts Wetlands Restoration Program with partial funding provided by the Massachusetts Bays Program, completed: 1996

This study was WRP's first restoration planning project and covers the North Shore coastal region from New Hampshire to Boston. The atlas contains maps of tidal wetland habitats with various classifications and shows locations of potential tidal restrictions and tidally-resricted coastal wetlands. 190 sites were identified.

Shawsheen River Watershed Wetlands Restoration Plan

• Produced by the Massachusetts Wetlands Restoration Program with funding provided by the MA Dept. of Environmental Protection, completed: 2002

This plan identifies, characterizes, and prioritizes freshwater 63 wetland restoration opportunities in the Shawsheen River Watershed. The majority of sites identified are historically filled wetlands that appear to offer practical, physical restoration options. Other restoration opportunities include ditched/drained and diked/impounded wetlands. These sites may be particularly useful to officials and others looking for good opportunities to compensate for wetland alterations or other environmental impacts caused by construction.

Rumney Marshes ACEC Salt Marsh Restoration Plan

• Produced by the Massachusetts Wetlands Restoration Program and the Massachusetts Areas of Critical Environmental Concern Program, completed: 2002

The Rumney Marshes Restoration Plan provides an inventory of 14 completed and 16 potential salt marsh restoration opportunities within the boundary of the Rumney Marsh ACEC. Summary descriptions with maps and photos are provided for both completed and potential restoration projects. The Plan identifies 5 projects that are recommended as priorities for implementation. Several sites in the plan are now in various stages of project development.

Maynard-Assabet Wetlands Restoration Inventory Project

• Produced by Epsilon Associates, Inc., a private consulting firm, as a donation under the Massachusetts Corporate Wetlands Restoration Partnership, completed: 2001

This inventory project covers three sub-watersheds of the Assabet River in the towns of Maynard, Acton, Stow, and Sudbury. 40 potential restoration sites were identified using

GIS analysis and local input, were evaluated in the field, and were then prioritized based on their restoration potential. Restoration opportunities address various impacts including fill, degraded water quality, and altered hydrology. The plan provides conceptual restoration designs for the top 5 sites.

Blackstone River Watershed Wetlands Restoration Plan

• Produced by the Massachusetts Wetlands Restoration Program and Worcester County Conservation District with funding provided by the MA Dept. of Environmental Protection, completed: 2003

This plan identifies, characterizes, and prioritizes 71 freshwater wetland restoration opportunities in the Upper Blackstone River Watershed. The majority of sites identified are historically filled wetlands that appear to offer practical, physical options for restoring wetland structure and function. Other restoration opportunities include ditched/drained and diked/impounded wetlands. Identified sites may provide good opportunities for wetland mitigation.

Neponset River Watershed Wetlands Restoration Plan

• Produced by the Massachusetts Wetlands Restoration Program with assistance provided by the U.S. Army Corps of Engineers New England District, completed: 2000

This restoration plan identifies, characterizes, and prioritizes both tidal and non-tidal potential wetland restoration sites (171) in the study area. Restoration opportunities include fill removal, restoration of tidal hydrology, and enhancement of wildlife habitat. The Plan identifies 7 restoration goals developed with planning partners and 65 sites as priorities for restoration based on their potential to address those goals.

South Shore Tidal Restriction Atlas

• Produced by the Metropolitan Area Planning Council with funding provided by the Massachusetts Wetlands Restoration Program, completed: 2001

The South Shore Atlas provides an inventory of potential tidal restrictions and affected wetlands along the Massachusetts coast between Weymouth and Plymouth. Twenty-five high priority sites are detailed in one-page summaries with maps, photos, and descriptions of site features. The Atlas recommends a variety of potential restoration actions that focus primarily on the removal of tidal restrictions, but also address potential stormwater problems. 121 potential restoration sites were identified.

Mount Hope Bay Tidal Restriction Atlas

• Produced by the U.S. Army Corps of Engineers New England District in partnership with the Massachusetts Wetlands Restoration Program, completed: 2003

The Mount Hope Bay Atlas provides maps, photos, and detailed descriptions of 25 tidal restrictions in the study area. Sites were identified based on GIS analysis, field work, and input from local officials. WRP is now working with the Army Corps of Engineers to

conduct follow-up technical assessments on several of the most promising sites. The goal is to prepare several sites for conceptual restoration design work and funding applications.

Buzzards Bay Tidal Restriction Atlas

• Produced by the Buzzards Bay Project with funding provided by the Massachusetts Wetlands Restoration Program, Massachusetts Department of Environmental Proteciton, and Massachusetts Environmental Trust, completed: 2002

The Buzzards Bay Atlas inventories and prioritizes 257 potential tidal restrictions along the coastline of the Buzzards Bay watershed. Sites are ranked based on several factors including estimated construction costs and size of restricted wetland. The document provides site profile pages with maps and photos for the 30 highest ranking sites.

Buzzards Bay Selected Inventory of Restoration Sites

• Produced by the Buzzards Bay Project with funding provided by the Massachusetts Office of Coastal Zone Management, completed: 2005

This selected inventory identifies 204 fresh and saltwater wetlands that have been physically altered (mostly filled) on public lands, private conservation areas, and within abandoned cranberry bogs. Sites were included if they offer practical opportunities for restoration. The inventory covers the entire Buzzards Bay watershed in two phases: Phase I - Southern; Phase II - Northern & Eastern. Maps, aerial images, and summary descriptions are provided for all sites.

New Bedford Harbor Wetlands Restoration Plan

• Produced by the Massachusetts Wetlands Restoration Program with funding provided by the New Bedford Harbor Trustee Council, completed: 2003

This plan was prepared at the request of the New Bedford Harbor Trustee Council to identify high-value fresh and tidal wetland restoration opportunities where funds can be spent to produce significant environmental benefits. The plan provides maps, aerial photos, and summary descriptions for 69 potential restoration sites that include filled wetlands, tidal restrictions, and other impacts. The Council and the NOAA Restoration Center are now pursuing some of the highest value sites identified in the plan.

Cape Cod Tidal Restriction Atlas

•Produced by the Cape Cod Commission with funding provided by the Massachusetts Wetlands Restoration Program and Massachusetts Bays Program, completed: 2001

The Cape Cod Tidal Restriction Atlas identifies and describes 114 tidal restrictions based on GIS analysis of the study area, extensive field work, and input from local officials. Maps, photos, and summary descriptions are provided for all sites. Several sites in the atlas have now been restored or are nearing construction, and many more are being

studied for project feasibility. The Cape Cod region contains some of the largest restoration opportunities in the Commonwealth.

Cape Cod Water Resources Restoration Plan
http://www.capecodcd.org/Cape_Cod_Water_Resources.pdf

Restoration Plans in Development

Mass Bays Program, *Boston Harbor Restoration Atlas*, funded by the Mass Environmental Trust and Massachusetts Division of Marine Fisheries, *Identifying and Prioritizing Restoration Opportunities for Coastal Aquatic Habitats in the Mass Bays Region*, funded by the Mass Bays Program