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Department of Fish and Game

In-Lieu Fee Program

2016 Annual Report

Revised (March 1, 2017)

I. Executive Summary

Since the In-Lieu Fee Program ("ILFP") of the Massachusetts Department of Fish and Game ("DFG") was established in May 2014, nineteen (19) U.S. Army Corps of Engineers ("Corps") permittees have made an in-lieu fee ("ILF") payment to the program. The funds received by DFG since the ILFP was established total $1,092,362.44.

In calendar year 2016 (1/1/2016 - 12/31/2016) eleven (11) permits authorizing an ILF payment were issued by the Corps that resulted in impacts to 5,319 square feet (0.123 acres) of Marine Subtidal and Intertidal resources, 57 square feet (0.0013 acres) of Estuarine Intertidal resources, 46,621 square feet (1.07 acres) of Palustrine resources, and 110 linear feet of Riverine resources. DFG received ILF payments totaling $793,691.60 in 2016.

II. Background

In 2014 the Corps approved DFG to be the sponsor of a state-wide program that would provide in-lieu fee compensatory mitigation associated with Corps permits under §404 of the Clean Water Act and/or §§9 or 10 of the Rivers and Harbors Act of 1899 and related federal rule at 33 C.F.R. Part 332 (the federal Mitigation Rule). Specifically, on May 23, 2014 the Corps and DFG signed an Instrument developed by DFG that set forth a comprehensive description of how DFG will administer its in-lieu fee program ("ILFP") in Massachusetts.

The availability of DFG's ILFP allows permittees, with the Corps' approval, to make a monetary payment in compensation for project impacts to aquatic resources of the U.S. in Massachusetts, *in-lieu of* on-site mitigation. When these in-lieu fee payments are made to the ILFP, DFG assumes legal responsibility for implementing the required mitigation, which it does by aggregating and expending the in-lieu payments on mitigation projects.

DFG's ILFP is being administered by its three divisions – the Division of Marine Fisheries ("DMF"), the Division of Fisheries and Wildlife ("DFW") and the Division of Ecological Restoration ("DER") - and will implement mitigation projects that permanently protect aquatic resources and upland buffers and/or restore impacted aquatic resources within four (4) service areas. DFG will select ILFP mitigation projects through its application of detailed prioritization criteria in the ILFP Instrument, which includes consideration of a potential project's ability to achieve multiple mitigation objectives and its support or compatibility with broader conservation or management initiatives.

From June 2008 to June 2013, DMF served as the program sponsor for an ILFP established to provide mitigation for impacts to aquatic resources of marine and diadromous fish species in Massachusetts. That ILFP, however, was limited to providing mitigation associated with coastal alteration projects that altered less than one acre of aquatic resource and met the criteria for coverage under the Corps' General Permit ("GP") for Massachusetts. DFG's state-wide ILFP covers impacts to all types of aquatic resources from both small-sized projects covered under the GP and larger projects that require an individual permit ("IP") from

the Corps. Section V of this Annual Report summarizes the history of DMF's ILFP and status of mitigation projects funded by the ILFP.

Section XVIII of the Instrument requires DFG to submit an annual report to the Corps, which must include information on each Corps-permitted project for which an ILFP payment was made to DFG, the ending balance of ILFP credits advanced and released at the end of the annual reporting period for each service area and a related financial accounting ledger. This Annual Report includes all ILFP information tracked from the date of the establishment of the ILFP on May 23, 2014 through December 31, 2016.

III. Description of DMF ILFP Mitigation Project Approved to Proceed by the Corps in 2016

In 2016 DFG determined that it had received a sufficient amount of ILF payments to fund and select a mitigation project to be implemented, subject to the approval of the Corps in consultation with the Interagency Review Team (IRT). More specifically, DFG's Division of Marine Fisheries (DMF) proposed to use ILFP funds to restore approximately ½ acre of eelgrass at one site in Salem Sound and one site in Boston Harbor. Both sites are located within the ILFP's Coastal Service Area, Northern Subarea. DMF has a long-standing, ongoing and successful eelgrass restoration program, and so is uniquely qualified to conduct this type of restoration. Per the Corps' process, the Corps published notice of a 30 day public comment period on DMF's proposal in July, 2016. In response to comments received from the IRT on the proposal, DMF submitted revised proposal to the Corps and the IRT in November, 2016. In a letter to DFG dated December 23, 2016, the Corps stated that DMF may proceed with its mitigation proposal. DMF will begin the planting of eelgrass at the above two sites beginning in the spring of 2017. The planting will take two (2) seasons to complete and will be followed by five (5) additional years of monitoring to verify that the eelgrass restoration has been successful.

A detailed description of DMF's eelgrass restoration project and the related credit release schedule as approved by the Corps is contained in **Attachment 1** to this Annual Report.

IV. Corps-Permitted Impacts and ILFP Payments received by DFG

Table 1 below provides information on the Corps-permitted projects for which an ILFP payment was made to DFG.

As shown in **Table 1** below, the total amount of ILFP payments received by DFG from May 23, 2014 - December 31, 2016 is $1,092,362.44.

Table 1: Summary of All Payments Received by Service Area (May 23, 2014 – December 31, 2016)

Service Area	Name of Permittee	ACOE Permit Number	Permit Issued	Project Location	Aquatic Resource Impacted	Authorized Impact		ILF Amount Required	Date Payment Received
						Square Feet	Linear Feet		
Coastal	Global Companies, LLC	NAE-2011-106	8/1/2014	Chelsea	Marine - Subtidal	526	0	$19,265.00	9/11/2014
					Marine - Intertidal	825	0		
Coastal	Charles Loutrel	NAE-2014-2637	4/20/2015	Marblehead	Marine - Subtidal	184	0	$2,623.84	5/5/2015
Coastal	Algonquin Gas Transmission, LLC	NAE-2014-114	4/1/2015	Salem	Marine - Subtidal	10,628	0	$151,554.00	6/24/2015
Coastal	Town of Scituate	NAE-2006-3754	5/30/2008	Scituate	Estuarine - Salt Marsh	7,000	0	$99,820.00	9/8/2015
Coastal	Mary C. Kariotis	NAE-2014-01583	1/2/2014	Barnstable	Marine - Subtidal	99	0	$1,408.00	11/5/2015
Coastal	City of Salem	NAE-2005-1095	12/21/2015	Salem	Marine - Intertidal	200	0	$2,852.00	1/11/2016
Coastal	Nicholas Iselin for Lend Lease Development. Inc.	NAE-2004-525	4/4/2016	East Boston	Marine - Subtidal	353	0	$5,040.00	4/27/2016
Coastal	Lisa Martinez and Chris Williams	NAE-2015-1169	3/16/2016	Manchester	Marine - Intertidal	57	0	$812.00	6/28/2016
Coastal	New England Power Company/National Grid	NAE-2015-00875	3/23/2016	Tewksbury, Andover, Dracut	Palustrine - Forested Wetlands	15,919	0	$227,009.00	8/5/2016
Coastal	Economic Development and Industrial Corp. of Boston	NAE-2016-1170	7/26/2016	Boston	Marine - Subtidal	1,306	0	$18,623.00	8/19/2016
Coastal	MA Dept. of Conservation and Recreation	NAE-1999-03185	6/30/2016	Canton	Palustrine	210	0	$3,000.00	10/14/2016
Coastal	Great Island Homeowner's Assoc. Inc.	NAE-2002-00169	11/2/2016	West Yarmouth	Estuarine - Salt Marsh	40	0	$570.40	11/8/2016
Coastal	MassDOT-Highway Division	NAE-2016-01044	8/17/2016	Norwell	Palustrine - Forested Wetlands and Riverine	12,197	64	$212,326.00	12/9/2016
Coastal	Wynn MA LLC	NAE-2013-1026	12/12/2016	Everett	Marine - Subtidal	3,420	0	$48,769.20	12/14/2016
Coastal	US Army Corps of Engineers	NAE-2015-00827	11/1/2016	Taunton	Palustrine - Emergent	18,295	0	$260,890.00	12/21/2016
Coastal Total:						***71,258.75***	***64***	***$1,054,562.44***	
Connecticut River	Tennessee Gas Pipeline Company	NAE-2014-1772	10/10/2014	Southwick	Riverine	0	125	$12,500.00	10/24/2014
Connecticut River	Exxonmobil Corp.	NAE-2013-1364	10/8/2013	Greenfield	Riverine	0	90	$9,000.00	12/9/2014
Connecticut River Total:						***0***	***215***	***$21,500.00***	
Berkshire	Tennessee Gas Pipeline Company	NAE-2014-01945	10/27/2014	Tyringham	Riverine	0	25	$2,500.00	11/6/2014
Berkshire	MassDOT-Highway Division	NAE-2015-01572	9/1/2016	Shelburn	Riverine	0	46	$13,800.00	12/9/2016
Berkshire Total:						***0***	***71***	***$16,300.00***	
Statewide Total:						**71,258.75**	**350**	**$1,092,362.44**	

Table 2 - 2016 Ending Balance of Credits by Service Area

Service Area	Credits Advanced		Credits Sold		Credits Released		2016 Ending Balance	
	Acreage	Linear Feet	Acreage	Linear Feet	Acreage	Linear Feet	Acreage	Linear Feet
Coastal	130.00	162,819.00	1.64	64.00	0.00	0.00	128.36	162,755.00
Worcester	52.00	2,500.00	0.00	0.00	0.00	0.00	52.00	2,500.00
Connecticut River	50.00	2,500.00	0.00	215.00	0.00	0.00	50.00	2,285.00
Berkshire	50.00	5,741.00	0.00	71.00	0.00	0.00	50.00	5,670.00

Similarly, **Table 3** below shows, consistent with Table 2, that no credits corresponding to the main mitigation components of DFG's ILFP were released by DFG as of December 31, 2016.

Table 3 - Credits Released by DFG ILFP Component and Year

	Credits Released					
	2014		2015		2016	
DFG ILFP Component	Acreage	Linear Feet	Acreage	Linear Feet	Acreage	Linear Feet
Coastal/Marine	0.00	0.00	0.00	0.00	0.00	0.00
Inland Aquatic	0.00	0.00	0.00	0.00	0.00	0.00
Land Preservation	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Finally, **Table 4** sets forth the financial account ledger below that shows the beginning and ending balances for DFG's ILFP program account in 2016 by Service Area including: ILFP payments received; interest earned; disbursements; and administrative overhead expenditures from the program account. Note: The Instrument allows DFG to deduct 17.5% of all ILFP payments collected to cover DFG's costs of administering the ILFP, or $191,163 of the $1,092,362.44 in ILFP payments received through December 31, 2016. To date, existing DFG personnel have been administering the ILFP and DFG has not used any of the allowed administrative overhead set-aside, including in 2016.

Table 4 - 2016 Financial Account Ledger

Service Area	(A) Beginning Balance January 1, 2016	(B) Payments Received	(C) Interest Earned	(D) Disbursements	(E) Administrative Overhead Expenditures	Ending Balance December 31, 2016 (A+B+C-D-E)
Coastal	$274,670.84	$779,891.60	$0.00	$0.00	$0.00	$1,054,562.44
Worcester	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Connecticut River	$21,500.00	$0.00	$0.00	$0.00	$0.00	$21,500.00
Berkshire	$2,500.00	$13,800.00	$0.00	$0.00	$0.00	$16,300.00
Totals	**$298,670.84**	**$793,691.60**	**$0.00**	**$0.00**	**$0.00**	**$1,092,362.44**

Note: DFG's ILFP program account is a state administrative expendable trust that does not earn interest.

V. Summary of the History and Status of the DMF ILFP

A. Background and ILFP Accounting

As noted in the Background section to this Annual Report, DMF was the program sponsor for a predecessor ILFP from June 2008 to June 2013. DMF's ILFP pre-dated the application of the Corps' ILFP regulations at 33 C.F.R. Part 332 and was governed by a Memorandum of Understanding (MOU) between DMF and the Corps, rather than an ILFP Instrument. Since the expiration of DMF's ILFP in June 2013, no new ILFP payments have been made to DMF, and its program has been superseded by DFG's state-wide ILFP established by the Instrument signed by DFG and the Corps on May 23, 2014. However, because DMF continues to administer the ILFP payments and mitigation projects funded by such payments, this Annual Report by DFG summarizes the history and status of DMF's ILFP and provides updates on the progress of the mitigation projects funded through the program.

Under DMF's ILF program, twenty-seven (27) projects impacting 18,980.40 ft^2 of aquatic habitats contributed $229,117.00 to the program. Table 1 below provides a breakdown of authorized impacts (ft^2) by service area, habitat type, and year of payment. Table 2 below provides a summary of all ILFP payments made to DMF's ILFP since its inception in 2008, including the type and amount of impact (ft^2) of aquatic habitat impacted by the Corps-permitted project, the location of the impact by service area and town/watershed, the Corps permit number, the date of DMF's receipt of the ILFP payment, and deposit amount by project year. Table 3 below summarizes the financial account ledger for the life of the DMF ILFP, including the total amount of ILFP payments received, the total amount allocated for DMF's administrative set-aside (12% as established in the MOU), and the amounts used to fund the four (4) mitigation projects funded by the ILFP.

Table 4 shows the type and frequency of habitat impacts and the corresponding ILFP payments by the three regions with the Coastal Service Area identified by DMF (North, Central and South), and that the average impact area was 790.83 ft^2 and the average ILF payment was $9,546.54. Table 4 also shows that:

- the habitat category with the greatest impacted area is Open Water with 15847.75 ft^2;
- the Coastal region with the largest impacted area is the South with 12938 ft^2 of impacted habitats;
- there were 11 impacts to aquatic habitats in the North service area, 9 impacts in the Central service area, and 11 impacts in the South service area; and
- there were 3 projects that impacted multiple habitat types.

Table 1. Authorized impacts (ft^2) by habitat type

Service Area	Habitat	Year Received					Total (ft^2)
		2009	2010	2011	2012	2013	
Central	Mud flat	16.00	32.00		81.00	26.00	155.00
	Open water					20.00	20.00
	Salt marsh		125.00			88.00	213.00
Central Total		16.00	157.00		81.00	134.00	388.00
North	Mud flat	2.00	200.00	1,250.00	55.00		1,507.00
	Open water	785.25	1,273.00	624.00	1,100.00		3,782.25
	SAV					364.75	364.75
North Total		787.25	1,473.00	1,874.00	1,155.00	364.75	5,654.00
South	Mud flat	300.00			150.00		450.00
	Open water			8,410.00	1,583.50	2,052.00	12,045.50
	SAV			425.50		17.40	442.90
South Total		300.00		8,835.50	1,733.50	2,069.40	12,938.40
Grand Total		1,103.25	1,630.00	10,709.50	2,969.50	2,568.15	18,980.40

Table 2. ILFP Deposit Summary

Service Area	Habitat	Town/Watershed	Permit Number	Payment Rcvd Date	Area of Impact (sq ft)	Project Year						Grand Total
						2008	2009	2010	2011	2012	2013	
Central	Mud flat	Duxbury	2008-3219	1/29/2010	20		$400.00					$400.00
			2008-3220	4/20/2010	12		$240.00					$240.00
			2008-3485	9/22/2011	20		$400.00					$400.00
			2008-3490	5/11/2009	16		$160.00					$160.00
			2011-00670	7/13/2011	26				$520.00			$520.00
		Plymouth	2004-00364	10/22/2012	61					$1,220.00		$1,220.00
	Open water	Duxbury	2012-02680	1/28/2013	20						$200.00	$200.00
	Salt marsh	Duxbury	2008-3220	4/20/2010	125		$2,500.00					$2,500.00
			2011-00670	7/13/2011	88				$1,760.00			$1,760.00
Central Total							**$3,700.00**		**$2,280.00**	**$1,220.00**	**$200.00**	**$7,400.00**
North	Mud flat	Rockport	2009-709	4/6/2010	200		$4,000.00					$4,000.00
		Salem	2007-2786	11/9/2009	2		$150.00					$150.00
		Saugus	1984-00335	1/24/2012	55					$1,100.00		$1,100.00
		Somerville	2009-2702	11/14/2011	1250			$25,000.00				$25,000.00
	Open water	Beverly	2010-1995	1/6/2011	80			$800.00				$800.00
		Chelsea	2011-00807	3/20/2012	1100					$11,000.00		$11,000.00
		Danvers, Crane River	2009-2418	1/31/2011	544				$5,400.00			$5,400.00
		Newburyport	2009-1427	10/26/2009	35		$352.50					$352.50
		Salem	2008-3223	5/12/2010	1273		$12,730.00					$12,730.00
		Weymouth, Fore River	2008-2574	1/6/2009	750	$7,500.00						$7,500.00
	SAV	Marblehead	2013-00126	6/3/2013	365				$10,942.50			$10,942.50
North Total						**$7,500.00**	**$17,232.50**	**$25,800.00**	**$16,342.50**	**$12,100.00**		**$78,975.00**
South	Mud flat	Dartmouth	2012-00764	7/23/2012	150					$3,000.00		$3,000.00
		Harwich	2007-2548	5/20/2009	300		$6,000.00					$6,000.00
	Open water	Dartmouth	2012-00764	7/24/2012	968					$9,675.00		$9,675.00
		Fairhaven	2009-2273	1/31/2011	459		$4,590.00					$4,590.00
		New Bedford	2005-2900	5/26/2011	7951				$79,510.00			$79,510.00
		Somerset	2007-3044	11/22/2011	2052						$20,520.00	$20,520.00
		Yarmouth	2009-399	3/9/2012	616		$6,160.00					$6,160.00
	SAV	Marion	2010-02451	3/18/2011	426				$12,765.00			$12,765.00
			2012-02581	1/11/2013	11						$330.00	$330.00
		Mattapoisett	2010-01158	4/19/2013	6						$192.00	$192.00
South Total							**$16,750.00**		**$92,275.00**	**$12,675.00**	**$21,042.00**	**$142,742.00**
Grand Total						**$7,500.00**	**$37,682.50**	**$25,800.00**	**$110,897.50**	**$25,995.00**	**$21,242.00**	**$229,117.00**

Table 3. Financial Accounting

		Total Income	Payment Amount	
ILF Funds Received (2008 -2013)		$ 229,117.00		
Administrative Fee (12%)			$ 27,494.04	
Funded Projects:				Total Project cost
	1. Off Billington St. Dam removal		$ 128,202.00	$1,279,783.47 [i]
	2. Rough Meadows		$ 14,704.00	$18,206.00 [ii]
	3. Great Marsh		$ 23,800.00	$68,300.00 [iii]
	4. Draka Dam (partial funding)		$ 34,916.96	$121,900.00 [iv]
Total expended on Funded Projects			$ 201,622.96	

[i] Source: Off Billington Street Final Report, submitted 10/8/2014

[ii] Source: MA Audubon grant application, submitted 10/30/2102

[iii] Source: MVPC grant application, submitted 10/30/2012

[iv] Source: MA DMF grant application, submitted 10/30/2012 (Project has not been completed as of 02/2017. Final project cost amount is expected to increase)

Table 4. ILFP Payments Assessed and Used by Permittee

Year of payment receipt	Region	Habitat type	Number of habitat impacts	Area of habitat impact (ft^2)	Sum of fee amount
2009	North	Mud flat	1	2	$150.00
2009	North	Open water	2	785.25	$7,852.50
2010	North	Mud flat	1	200	$4,000.00
2010	North	Open water	1	1273	$12,730.00
2011	North	Mud flat	1	1250	$25,000.00
2011	North	Open water	2	624	$6,200.00
2012	North	Mud Flat	1	55	$1,100.00
2012	North	Open water	1	1100	$11,000.00
2013	North	SAV	1	364.75	$10,942.50
2009	Central	Mud flat	1	16.00	$160.00
2010	Central	Mud flat	2	32.00	$640.00
2010	Central	Salt marsh	1	125.00	$2,500.00
2012	Central	Mud flat	1	20	$400.00
2012	Central	Mud flat	1	61.00	$1,220.00
2013	Central	Salt Marsh	1	88.00	$1,760.00
2013	Central	Mud Flat	1	26.00	$520.00
2013	Central	Open Water	1	20.00	$200.00
2009	South	Mud flat	1	300	$6,000.00
2011	South	Open water	2	8410	$84,100.00
2011	South	SAV	1	425.5	$12,765.00
2012	South	Mud flat	1	150	$3,000.00
2012	South	Open water	2	1583.5	$15,835.00
2013	South	SAV	2	17.00	$522.00
2013	South	Open Water	1	2052.00	$20,520.00
Total			30	18980.00	$229,117.00
Average				790.83	$9,546.54
By Region		North	11	5654.00	$78,975.00
		Central	9	388.00	$7,400.00
		South	11	12938.00	$142,742.00
By Year		2009	5	1103.25	$14,162.50
		2010	5	1630.00	$19,870.00
		2011	6	10709.50	$128,065.00
		2012	7	2969.50	$31,335.00
		2013	6	2,567.75	$34,464.50
By Habitat Type		Mudflat	13	2200.00	$43,950
		Open water	12	15847.75	$158,438
		Salt marsh	2	213.00	$4,260
		SAV	4	807.25	$24,230

**Three projects impacted 2 habitat types. As such, there are 30 habitat impacts but only 27 projects in total.*

B. Summary of the Mitigation Projects Funded by the DMF ILFP

DMF allocated the total amount ILFP payments made to its ILFP to fund four (4) mitigation projects that DMF selected through a Request for Proposals (RFP) process initiated in September 2012. Below is a summary description of these ILFP-funded mitigation projects.

Project 1. Off Billington Street Dam Removal Project – Plymouth

The Town of Plymouth was awarded $128,202.00 in ILFP funds to facilitate the removal of the Off Billington Street Dam. The structure was replaced with an arch bridge. In order to improve water quality, contaminated sediment from behind the dam was removed. The completed mitigation project provides unimpeded fish passage for alewife, blueback herring, and American eel and is part of a larger comprehensive approach to restoring the historic anadromous fish run at Town Brook, eventually re-establishing river herring access to 269 acres of spawning habitat once all phases of the project are completed. The project also opened up an additional 400 linear feet of stream habitat at a total estimated cost of almost $1.5 million dollars. Specifically, the ILFP funding contribution to the project was used to vegetate the exposed stream banks once the impoundment behind the dam was drained. A detailed report outlining work activities completed to date entitled "Off Billington Street Final Report" was received by DMF on October 9, 2014.

In September 2016 representatives from the Corps conducted a site visit to the Off Billington Street Dam removal Project, noting the seasonal condition of vegetation along the banks and the progression of the work done to the site over the past year, including complete removal of the next upstream impediment, the Plymco Dam.

Credit Ledger Summary (Last Transaction 12/20/2012)

Name	Available Credits	Withdrawn Credits	Released Credits	Potential Credits
Stream				
Stream/River - Reestablishment	0	0	0	7.4

Project 2. Rough Meadows - Rowley

The Massachusetts Audubon Society (MAS) was awarded $14,704.00 in ILFP funds for a mitigation project that contributed to the restoration of salt marsh and immediately adjacent brackish marsh at Rough Meadows Wildlife Sanctuary in Rowley, Massachusetts. This funding was used over a three-year period for treatments necessary to accomplish the eradication or near eradication of targeted common reed (*Phragmites*) stands. Successful implementation will result in the restoration of approximately 5.5 acres of marsh habitat and reduce the likelihood of the spread of common reed to additional areas. Elimination of the targeted common reed colonies will improve marsh ecosystem health and reduce the spread of common reed as the

result of disturbance associated with climate change and coastal alterations throughout the region. In addition, the control of common reed should facilitate the migration of salt marsh as sea level rises as predicted by climate change models.

According to an October 2013 project status report, the Rough Meadows Sanctuary was explored on foot to locate and map all common reed stands present in May 2013. Twenty-seven stands, ranging in size from 0.01 to 2.91 acres, were located and mapped. The total mapped area of common reed was 15.05 acres, exceeding the 5.5-acre estimate of the area of common reed present identified in MAS' application for a grant from the ILFP. MAS estimates that approximately 9 acres of salt marsh habitat at Rough Meadows Wildlife Sanctuary will be restored using the ILFP funds.

All stands were revisited in spring 2014 to obtain a preliminary assessment of the success of the 2013 herbicide treatment. Vegetation monitoring quadrats were randomly located in several areas where the common reed was present prior to the 2013 treatment to quantitatively document the colonization of these areas by native plant species. Quadrats will be revisited annually to track vegetation changes, and follow-up herbicide treatments will be performed in September 2014 as needed. A detailed report outlining work activities completed to date entitled "Rough Meadows WS Phragmites Control Report 10.14 "was received by DMF on November 5, 2014.

In September 2016 representatives from the Corps and DMF conducted a site visit to the Rough Meadows Phragmites Control Project location, noting reductions to the spatial extent of all treated stands but also the potential threat of Phragmites recolonization from Phragmites stands existing on nearby properties. The Rough Meadows Common Reed Control Project, 2015 Annual Report submitted to DMF in December 2015 noted "the reduction in common reed cover as compared to pre-treatment increased from 92% in 2014 to 94% in 2015." In accordance with the provisions of the ILF award, the project proponent also designed and erected signage on-site and issued a press release in November describing the project and recognizing the funding sources.

Credit Ledger Summary (Last Transaction 12/20/2012)

Name	Available Credits	Withdrawn Credits	Released Credits	Potential Credits
Wetland				
E2EM	0	0	0	.97

E2EM = Salt marsh

Project 3. Upper Great Marsh – Newbury

The Merrimack Valley Planning Commission (MVPC) was awarded $23,800.00 in ILFP funds for a *Phragmites* control project located in the Upper Great Marsh in Newbury. The goal of this mitigation project is to return a large section (approximately 1,000 acres) of the northern end of the Great Marsh in Plum Island Sound to a healthy, natural state. As *Phragmites* is removed from the open, high marsh, native vegetation is expected to naturally re-colonize these areas, and the natural functions of the marsh, that have been impaired by the invasive monocultural growth, the vegetative, benthic, finfish, shellfish, and avian diversity is expected to return.

In a November 2013 project report, MVPC noted that a preliminary monitoring survey of an approximately 600-acre study area occurred in May 2013 to determine the extent and status of *Phragmites* in the2013 treatment area. The 2013 treatment area coincides with the areas previously mapped and treated in 2012. Newly mapped stands in the open marsh were treated in late September, 2013. Preliminary visual post-monitoring in the months of September and October 2013 indicated a successful kill of treated Phragmites stands over an approximately 30-acre area. A detailed report outlining work activities completed to date entitled Upper Great Marsh -"DMF ILF Final Report" was received by DMF in November 2013.

In September 2016 representatives from the Corps and DMF conducted a site visit to the Upper Great Marsh Phragmites Removal project location, noting some treated Phragmites patches still contain Phragmites shoots, but the shoots themselves are much smaller and the patches less dense. The project proponent indicated they would be returning to patchy areas in the fall to treat using backpack sprayers.

Credit Ledger Summary (Last Transaction 09/28/2016)

Name	Available Credits	Withdrawn Credits	Released Credits	Potential Credits
Wetland				
E2	3	0	3	3

E2 = Estuarine Fringed

Project 4. Draka Dam Fish Passage – Three mile River, Taunton

The DMF Diadromous Fish Project was awarded partial ILFP funding ($34,916.96) to help restore diadromous fish passage on the Three Mile River. The goal of this mitigation project is to provide spawning access for river herring to Mount Hope Pond by installing a fishway at the Draka Dam, which will restore the historic connection between the Taunton River and Narragansett Bay. This will allow diadromous fish to reach approximately 45 acres of spawning and nursery habitat upstream of the Draka Dam in Mount Hope Pond. Significant progress has been made on this project this year. In April 2016 the project received a permit from the Department of Conservation and Recreation, Office of Dam Safety, pursuant to M.G.L. c. 253,

§45A authorizing construction of a fish passage ladder on the Draka Dam. The Massachusetts Environmental Trust separately provided $40,000 in funding to Save the Bay for this project. Contracts and bids for constructing the fish ladder are currently being developed, with work expected to be completed in the summer of 2017.

Attachment 1

DMF Eelgrass Restoration Project

(Approved by the Corps to proceed on December 23, 2016)

Massachusetts Department of Fish and Game

In-Lieu Fee Program

Eelgrass Restoration Project Proposal

To be implemented by the Division of Marine Fisheries

Prepared By

T. Evans and J. Carr

Submitted to

The Massachusetts In Lieu Fee Program

Administered by the Department of Fish and Game

MarineFisheries
Commonwealth of Massachusetts

David E. Pierce

Director

Revised March 2, 2017

Introduction

In 2014 the Corps approved DFG to be the sponsor of a state-wide program that would provide in-lieu fee compensatory mitigation associated with Corps permits under §404 of the Clean Water Act and/or §§9 or 10 of the Rivers and Harbors Act of 1899 and related federal rule at 33 C.F.R. Part 332 (the federal Mitigation Rule). Specifically, on May 23, 2014 the Corps and DFG signed an Instrument developed by DFG that set forth a comprehensive description of how DFG will administer its in-lieu fee program ("ILFP") in Massachusetts.

The availability of DFG's ILFP allows permittees, with the Corps' approval, to make a monetary payment in compensation for project impacts to aquatic resources of the U.S. in Massachusetts, *in-lieu of* on-site mitigation. When these in-lieu fee payments are made to the ILFP, DFG assumes legal responsibility for implementing the required mitigation, which it does by aggregating and expending the in-lieu payments on mitigation projects.

DFG's ILFP is being administered by its three divisions – the Division of Marine Fisheries ("DMF"), the Division of Fisheries and Wildlife ("DFW") and the Division of Ecological Restoration ("DER") - and will implement mitigation projects that permanently protect aquatic resources and upland buffers and/or restore impacted aquatic resources within four (4) service areas. DFG selects ILFP mitigation projects through its application of detailed prioritization criteria in the ILFP Instrument, which includes consideration of a potential project's ability to achieve multiple mitigation objectives and its support or compatibility with broader conservation or management initiatives.

Since the establishment of DFG's ILFP, eight (8) U.S. Army Corps of Engineers ("Corps") permittees have made an in-lieu fee ("ILF") payment to the program totaling $298,670.84. Of this total amount, $274,670.84 of the ILF payments are derived from Corps-permitted impacts to subtidal, intertidal and estuarine marine resources in the Coastal Service Area. At the end of 2015 DFG determined that it had received a sufficient amount of ILF payments to fund and select one or more mitigation projects to be implemented beginning in 2016.

DFG's Evaluation of Potential Mitigation Projects

Representatives of DFG's Commissioner Office and DFG's Divisions met to identify, discuss and evaluate potential ILFP mitigation projects. In view of the type, location and scope of the Corps-permitted impacts underlying the great majority of ILF payments made to date, DFG determined at the outset that its first proposed mitigation project using ILFP funds should be to restore marine aquatic resources in the Coastal Service Area. DFG focused its attention

on two potential mitigation projects in the Coastal Service, specifically the North Subarea, discussed below.

- ***Key Marsh salt marsh restoration in Belle Isle State Reservation in Revere, MA.***

  This site, which is owned by the MA Department of Conservation and Recreation (DCR), contains about seven (7) acres of tide-restricted salt marsh and two (2) acres of filled salt marsh. The latter area has remnants of an abandoned radio tower facility built on the marsh and that is surrounded by an earthen dike designed to keep the tides out. To date, DER has only completed some preliminary assessment and design of restoration options.

  The big picture restoration goal is to restore tidal hydrology at this site. More specifically, on the northern portion of the site, the existing remnant berm would be removed to facilitate tidal exchange across the marsh surface. On the southern portion of the site, the berm would be breached at the location of the existing water control structure to restore tidal hydrology, and the breach area would be graded to mimic the channel profile of the historic tidal creek. A potential subsequent phase of the project would involve the removal of 2.2 acres of fill from to restore wetlands. At present, there are only a ballpark cost estimates in the range of $200,000 to $400,000, depending on scope of the dike and fill removal scope and the option selected to dispose of the materials. Current project partners include DCR, MassBays Program, Essex Co. Mosquito Control, Mystic River Watershed Association, and Friends of Belle Isle Marsh.

  DER does not have the staff resources to take the lead on project management, design, permitting, and construction. DCR, the land owner, has no intention of becoming the project lead either. Realistically, none of the other project partners has the capability and resources to assume the role of an effective project proponent. Thus, the absence of a capable and committed project lead is a key weakness in terms of both timely implementation and likelihood of success. Additionally, important aspects of the project have not yet been sufficiently developed (e.g., disposal approach; project costs; timeframe for implementation). Finally, DFG's proposed mitigation project – eelgrass restoration in Salem Harbor and Boston Harbor – has a closer nexus to the Corps-permitted impacts underlying the ILF payments.

- ***Eelgrass Restoration Project to be implemented by DMF***

  The second potential mitigation project considered by DFG was a proposal for DMF to use ILFP funds to restore approximately ½ acre of eelgrass to sites in Salem Sound and Boston Harbor, within the Coastal Service Area, Northern Subarea. By way of background, DMF has

a long-standing, ongoing and successful eelgrass restoration program, and so is uniquely qualified to conduct this restoration and fulfill the mitigation requirements of the ILFP. Beginning in 2005, DMF planted approximately five acres of eelgrass at sites in Boston Harbor as part of the Algonquin Hubline mitigation requirement (Hubline). Since that time the grass has more than doubled at the Long Island and Peddocks Island sites, to approximately 8.5 acres of eelgrass meadow. DMF recently completed the planting of two more acres of eelgrass in Massachusetts Bay, as part of a second mitigation requirement for Hubline (HUB3).

Site selection is a critical part of the restoration process. DMF has been working to refine site selection criteria throughout Massachusetts Bay and we are familiar with the best places to continue to restore eelgrass at this time. DMF proposed to restore eelgrass at two sites contiguous to sites that were successful in previous restoration efforts: Governor's Island Flats in Boston Harbor and Middle Ground in Salem Sound. DMF would plant ¼ acre at each site in the first year spread over two seasons. To ensure success, DMF would also augment plantings in the second year (third season) at previously planted sites and additional sites that have rated well in our site selection process. Finally, DMF has the requisite personnel with expertise that are available to complete the restoration within the above timeframes.

As between the Belle Isle Reservation tidelands restoration project and the eelgrass restoration project, DFG determined that the latter mitigation proposal by DMF is by far the strongest, most viable and timely ILFP mitigation project.

DFG's Selection of DMF's Proposed Eelgrass Restoration Project

For the reasons discussed in more detail below, DMF proposed and the DFG team selected, consistent with the ILFP project selection criteria in the Instrument, the specific eelgrass restoration project set forth in this proposal for review and approval by the Corps in consultation with the IRT.

Restoration Sites

Site Selection

DMF relied on its extensive in-water experience to select sites for this project. Due to degraded water quality, available sites for restoration are increasingly limited in Massachusetts. We selected sites adjacent to sites where we have had previous restoration success. We propose two primary sites at Governors Island Flats, Boston and Middle Ground, Salem. We also propose Great Brewster Island as a secondary site. It is prudent to plant over several seasons

to ensure uncontrollable events such as storms or bioturbators (e.g., crabs) do not eliminate an entire planting. For this reason we have proposed three seasons of planting.

Donor sites for the Hubline restoration were previously selected based on the physical characteristics of the site and the proximity to the transplant site, with consideration of the size and longevity of the donor meadow. For the proposed project we will begin with our established donor sites in Nahant and Beverly, while continuing to assess the most effective use of these and other possible donor meadows for optimal transplant success.

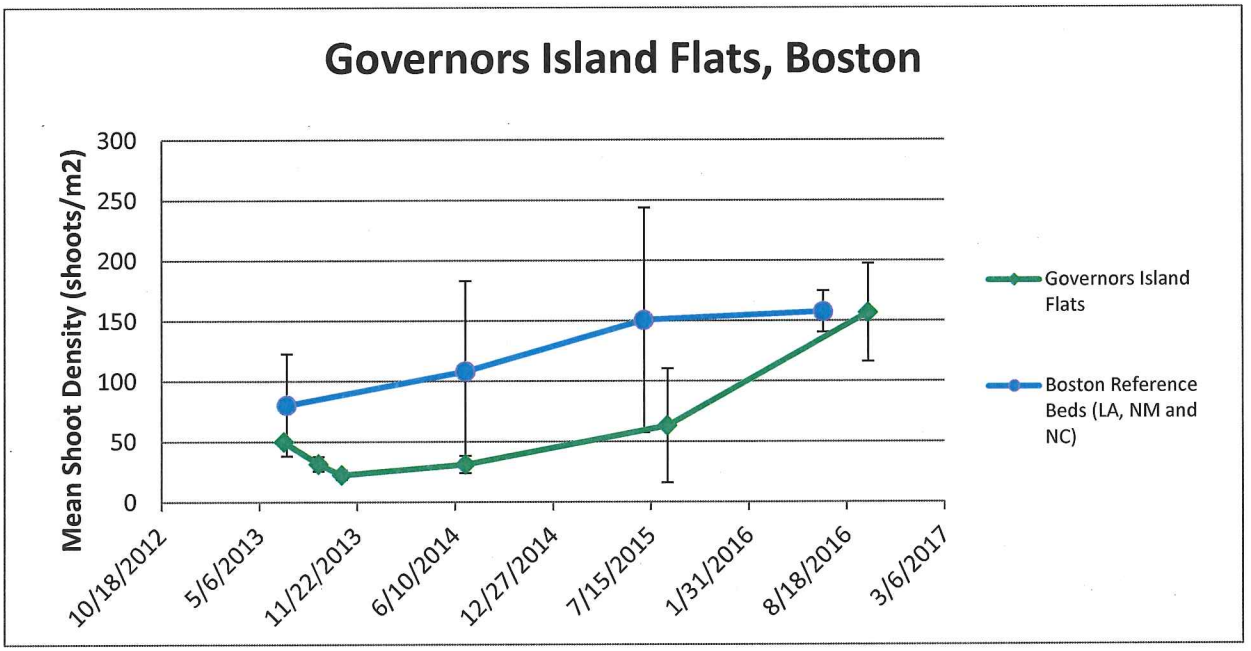
Success Criteria (performance standards)

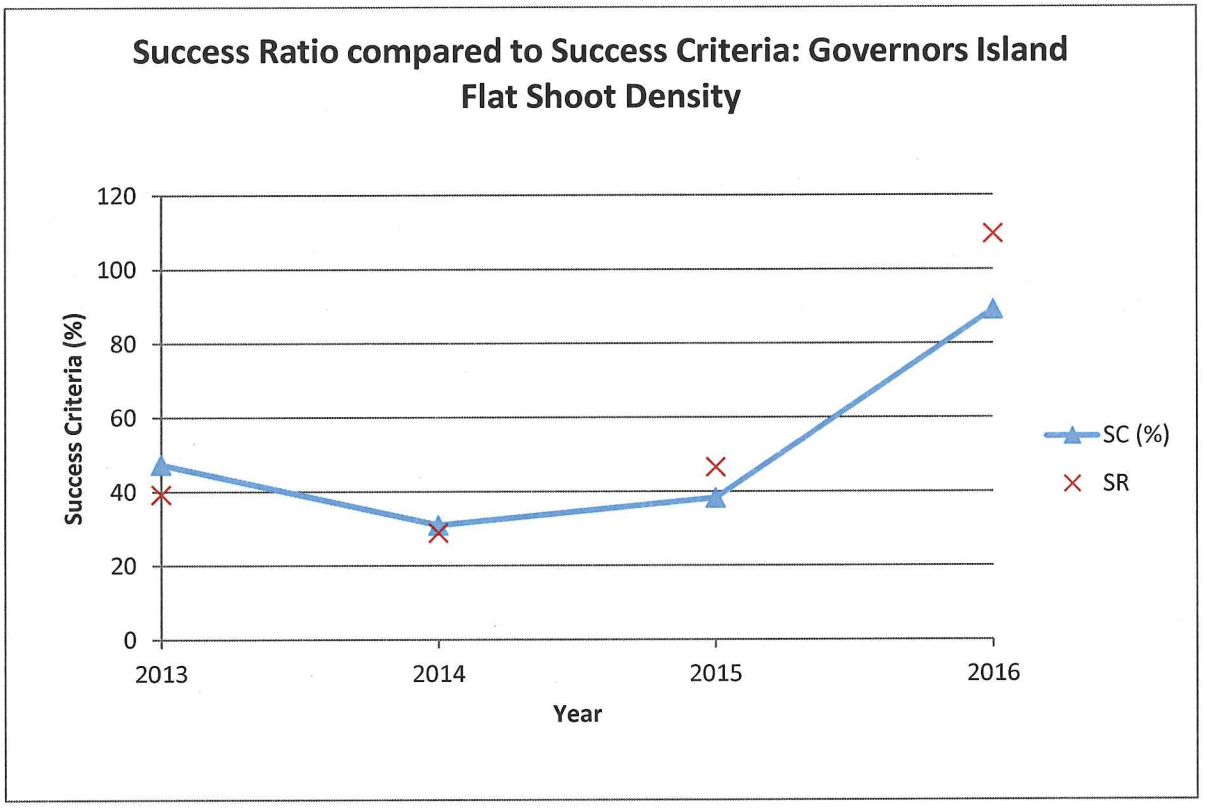
Transplant success will be determined by the persistence and expansion of the restored meadow over five years. Each year the restoration sites will be monitored and compared to values measured at reference sites. Within three years the plantings should be on a trajectory to reach the restoration targets, and after five years the targets should be met or the mitigation will not have successfully replaced the lost habitat (Evans and Short 2005). Restoration targets are defined as the desired acreage of ½ acre with a shoot density, % cover and canopy height statistically equivalent to reference levels. To determine if targets are met, we will compare a success ratio (SR) for each indicator at our restoration sites to Success Criteria (SC) calculated from local and representative reference sites. When the SR reaches the SC, that parameter is deemed a success. This method is described in Short et al (2000) with the following equations:

SC = 100*reference sites mean-1 Standard Deviation (SD)/ Reference sites mean

SR =100* Restoration site mean/Reference sites mean

The success criteria (SC) is calculated based on the mean and standard deviation (SD) for all the reference sites combined. This means that the threshold of success (the SC) is within one SD of the mean of the reference sites. The success ratio is the proportion of the mean at the restoration site compared to the mean at the reference site. The success ratio approaches 100 as the restoration site mean gets closer to the reference site mean. Below is a graph from our Governor's Island Flat restoration site showing shoot density at the restoration site compared to the reference sites. The second graph illustrates the SC and SR, showing that our restoration was successful for the shoot density parameter after three years (2015) and it exceeded the reference sites in 2016.


Governors Island Flats, Boston
Mean Shoot Density (shoots/m2)
300
250
200
150
100
50
0
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Governors Island Flats
Boston Reference Beds (LA, NM and NC)


Success Ratio compared to Success Criteria: Governors Island Flat Shoot Density
Success Criteria (%)
120
100
80
60
40
20
0
2013
2014
2015
2016
Year
SC (%)
SR

Governors Island Flats

Governors Island Flats (Figure 1) is a shallow bank within Boston Harbor. It is 5– 6 ft MLW, characterized by silty sediments. Historically, Governors Island flats had abundant eelgrass meadows.

DMF successfully planted a 1/3 acre area in 2013 at Governors Island Flats. Monitoring in 2015 showed plant growth and plot enlargement both through seeding and lateral expansion. Mean shoot density increased over the two years since transplanting and it is within one standard

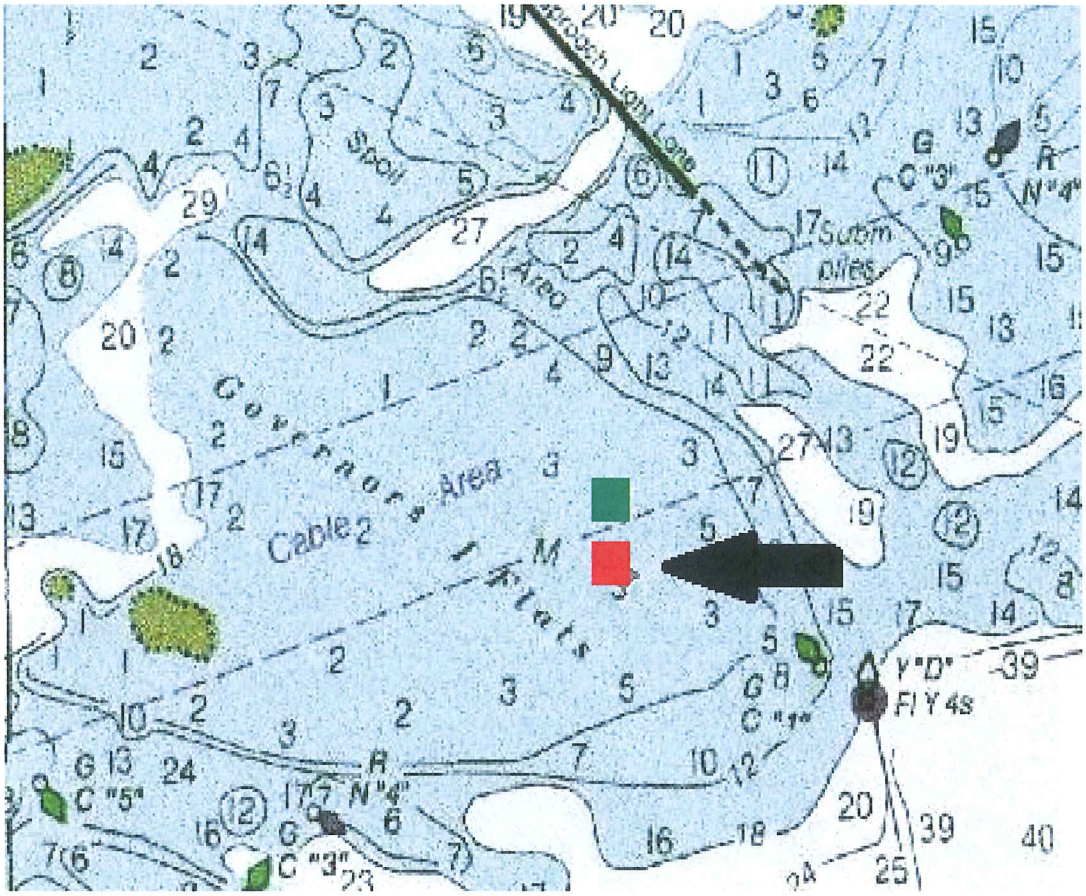


Figure 1. Proposed location of ¼ acre Restoration site at Governor's Island Flats (green) and hubline restoration site (red)

deviation of the mean of all the reference sites. There is additional area suitable for eelgrass restoration at the site and we propose the addition of ¼ acre shoreward of the existing restoration site (Figure 1). The exact location will be determined in the field based on suitable substrate. GPS locations will be obtained and included in all reporting. In the first season, a 1/8 acre site will be planted with eelgrass in a checkered pattern as shown in Figure 6. The following season an additional 1/8 acre will be planted at each site. We will augment the plantings as needed in the second year.

Middle Ground

Middle Ground, also known as Aqua Vite, is the shoal northeast of the mouth of Salem Harbor with depths of 6- 12 feet at MLW (Figure 3). There are anecdotal reports of this area having abundant eelgrass in past decades. We first investigated it in 2011 and found only a few small, scattered eelgrass patches. Light measurements indicated adequate light for eelgrass growth (Evans et. al 2013) and there is extensive area suitable for additional planting.

DMF successfully planted a 1/3 acre area at Middle Ground in 2012. Monitoring in 2015 showed plant growth and plot enlargement both through seeding and lateral expansion. Mean shoot density increased over the two years since transplanting and it is within one standard deviation of the mean of all the reference sites (Evans et. al 2013). A 1/8 acre site will be planted with eelgrass in the first season (e.g., spring) ,

Figure 2. Proposed location of ¼ acre Restoration site at Middle Ground (green) and hubline restoration site (red)

1/8 acre in the second season (e.g., fall of the same year), and will be augmented as needed in the third season (e.g.. spring of the following year).

Methods

Permitting

DMF obtained all required local, state and federal permits and authorizations for the above restoration and donor sites in 2005, as part of the Hubline restoration. The Boston Conservation Commission has determined that we will require a new NOI, filed as an Ecological Restoration Project, for the additional plantings. We are currently discussing the proposed project with the Commissions in the other towns and with the Army Corps of Engineers to determine if any other permits are needed.

Transplanting

Eelgrass shoots will be collected from donor beds in Nahant and Beverly using a low impact collection method where shoots are gathered by hand in a dispersed manner and no more than 1% are harvested from a m^2 area.

At Governors Island Flats and Middle Ground we propose to plant approximately 1/4 acre of eelgrass at each site in the first year. 5,200 transplanted shoots will be arranged in a checkered pattern of eight 5 m^2 plots of planted and unplanted 1 m^2 squares, for a total of 104 squares spread across the site (Figure 6). We will use the Burlap Disc method (Pickerell, pers. com) or a seeding method. When using the burlap disc method ten shoots are woven into a burlap disk by their rhizomes (Evans et al 2013). The discs are then planted in a shallow hole at five locations within a $1m^2$ quadrat.

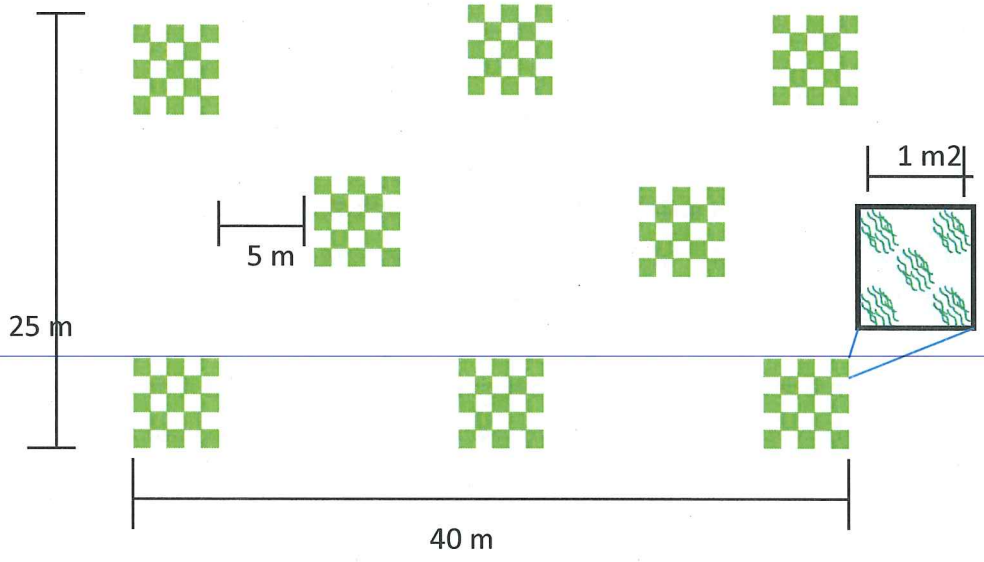


Figure 6. Layout for 1 site, approximately ¼ acre area. Eight plots each in a checkerboard pattern of 13 planted and unplanted 1 m2 squares for a total of 5,200 shoots.

Monitoring

We propose initial monitoring of the planted plots by divers one month after transplanting, and then both diver monitoring and acoustic mapping annually for five years. We will also monitor reference meadows for comparison.

Transplant Site

At the one month and annual monitoring events, divers will swim over each planted 5 m^2 plot and note the presence/absence of originally planted squares for the entire restoration area. This will provide an initial percent survival of the transplant. In addition, three planted squares in each plot, for a total of 24 squares per site, will be randomly selected for collection of shoot density, canopy height and percent cover measurements. The plot's length, width and diagonal will be measured to quantify areal expansion. This monitoring method will continue for five years at all planted sites to determine the overall expansion of the plantings through lateral growth and seeding, and finally to calculate the area successfully restored.

Reference Site

We have six reference beds, three in Salem Sound and three in Boston Harbor, which we plan to monitor for comparison with our transplanted sites in order to calculate restoration success according to a method described in Short et al (2000). Reference beds have similar depth, bottom type, and water conditions as the restoration sites.

At each reference site a transect tape will be set within a pre-established location. Shoot density, canopy height and percent cover will be measured at 12 1 m^2 quadrats assigned in a repeated random design at locations along the transect.

Acoustic mapping

Both restored and reference meadows will be mapped using hydroacoustic methods in the two planting years and again at the conclusion of the five year monitoring period, using a Humminbird 999CI HD SI unit with an 800 kHz high resolution transducer. The meadow area will be surveyed with overlapping lines for 150% sonar coverage. The resulting sonar files will have the water column removed and then be slant range and beam angle corrected in SonarTRX Pro release 15. The resulting lines will be exported and mosaiced in ArcGIS 10.2. In ArcGIS, areas within the mosaic that have eelgrass will be delineated. The area of the meadow will then be quantified and in the final years will be compared to mapped area from the previous years.

Budget

A detailed budget for DMF's eelgrass restoration project is set forth in **Attachment A** and addresses personnel costs (as well as the in-kind match being provided by certain DMF staff), costs for equipment and supplies, and costs for permitting.

ILF Prioritization Criteria

The Department of Fish and Game's (DFG) In Lieu Fee Program (ILFP) has developed prioritization criteria used to select mitigation projects. Below we outline our project's merits addressing each of the five criteria:

Criterion 1) The Project's Ability to Achieve Multiple Mitigation Objectives

The following seven mitigation objectives are identified in the ILFP instrument (p. 42). This project meets the five objectives in bold, each of which is described in detail below.

a. **Restores or improves more than one ecological function or system;**
b. Protects high quality resources/habitats for state-listed species protected under MESA;
c. **Protects important wildlife habitats identified by MassDEP's or other entities important habitat maps;**
d. Targets a high quality riparian habitat area;
e. Targets resources that are under threat of destruction or degradation;
f. Furthers the habitat protection climate change adaptation strategies described in the 2011 Massachusetts Climate Change Adaptation Report
g. Falls within one or more management and restoration climate change adaptation strategies.

a. *Restores or improves more than one ecological function or system*: The primary resource that will benefit from the proposed project will be eelgrass (*Zostera marina*). Eelgrass itself is an important habitat protected by the Massachusetts Wetlands Protection Act and the federal Clean Water Act and through NMFS Essential Fish Habitat provisions (discussed in greater detail below). It provides habitat for various life stages of commercial and recreational fishery resources such as winter flounder (*Pseudopleuronectes americanus*), American lobster (*Homerus americanus*), Atlantic cod (*Gadus morhua*), Pollock (*Pollachius virens*), white hake (*Urophycis tenius*),red hake (*Urophycis chuss*), tomcod (*Microcadus tomcod*), American eel (*Anguila rostrata*), striped bass (*Morone saxatilis*), bay scallop (*Argopecten irradians*) and juvenile stages of fish and invertebrates that serve as forage for the above mentioned species. Eelgrass is

also important to ecological function as it enhances the physical quality of the subtidal habitat, improves water quality through biogeochemical enhancements and sediment trapping, attenuates wave and storm energy, and sequesters carbon.

One of the challenges of habitat restoration in the subtidal zone is the limitation of appropriate project types. Projects could include removal of fill or debris (physical restoration) or creation of fisheries habitat or ecosystem services (physical plus ecosystem restoration). This project proposes the latter.

c. *Protects important wildlife habitats identified by MassDEP's or other entities important habitat maps*: This project will restore critical habitat identified by the Wetlands Protection Act, the Mid-Atlantic Fishery Management Council (MAFMC) and NMFS. MAFMC and NMFS have designated eelgrass as an Essential Fish Habitat (EFH) for cod, pollock, white and red hake, winter and summer flounder, as well as additional designation as a Habitat Area of Particular Concern (HAPC) for a subset of these species.

e. *Targets resources that are under threat of destruction or degradation*: Seagrasses are in decline worldwide (Short et al 2006, Short et al 2014), and declines have been observed statewide in Massachusetts (Costello and Kenworthy 2011) as well as in specific embayments (Costa 1988, DMF unpub. data). As an estuarine plant, seagrasses are useful indicators of estuarine health as they are subject to numerous threats of anthropogenic and environmental stresses. Such threats include nutrient loading, pollution, development-related habitat loss, impacts from boating and fishing activity, and shifting environmental conditions.

f. *Furthers the habitat protection climate change adaptation strategies described in the 2011 Massachusetts Climate Change Adaptation Report*: This project specifically addresses two adaptation strategies listed in the Coastal, Estuarine and Marine Habitats, Resources and Ecosystem Services section (pg114) of the report: Strategy 2, which focuses on improving resiliency of natural habitats through habitat restoration and other means; and Strategy 6 which calls for increased monitoring, observations and assessments to better manage resources and respond to critical shifts in benthic flora communities and areas of high trophic support. Monitoring at the restored and reference sites will include diver and acoustic monitoring and mapping for five years, which will be used to determine restoration success, but will also contribute to the body of knowledge from monitored sites in Massachusetts and New England, providing observation that can be used in a broader context as an early warning system to better manage and interpret change in eelgrass in the region.

g. *Falls within one or more management and restoration climate change adaptation strategies*: In addition to the strategies above, this project also addresses strategy g(iv) from the ILFP instrument (pg 43): Identify and assess potential restoration of coastal wetlands.

Criterion 2) The Project's Support of or Compatibility with Broader Conservation or Management Initiatives and Surrounding Landscape

The proposed project furthers the broader DFG management initiative of preserving the state's natural resources and people's right to conservation of those resources, as well as DMF's mission to manage the Commonwealth's living marine resources in balance with the environment. In DMF's Strategic Plan, improving and restoring fisheries habitat is a key strategy to achieving one of our primary goals: to improve fisheries sustainability, promote responsible harvest and optimize production of our living marine resources. There are also many other conservation and management initiatives focused on eelgrass and estuarine water quality protection and improvement, such as DEP's Eelgrass Mapping and Monitoring Program, the Massachusetts Estuaries Project and EPA's Estuarine Protection Program.

This project supports broader conservation initiatives within Salem Sound and Boston Harbor by supplementing previous restoration efforts and by complementing ongoing monitoring efforts in these embayments. In both embayments, many estuarine health studies are being conducted by local watershed, academic and government organizations such as MWRA, Salem Sound Coastwatch, Northeastern University, Salem State University, EPA, and others.

Criterion 3) The Project's Likelihood of Success

Eelgrass restoration is inherently risky as unpredictable factors including storms and algae blooms may impact newly planted areas. Many groups have attempted eelgrass restoration in Massachusetts with mixed results. DMF has had the most successful track record with eelgrass restoration over the past decade and has met the restoration goals for all projects undertaken. To date three of six sites that DMF fully planted are continuing to grow and expand.

Site selection is an important step in eelgrass restoration. Sites that are not well chosen may lack the conditions needed for growth and expansion resulting in a high probability of transplant failure. Our institutional knowledge of habitat suitability, along with our use of several different site selection models, and experience with planting dozens of test plot and full-scale restoration locations throughout Salem Sound and Boston Harbor gives us the necessary foundation for making sound site selection decisions for this project.

Criterion 4) Whether the Project will Result in Mitigation in the same Service Area

The draft 2015 ILF Program Annual Report states that 87% of the total impacts to the Coastal Service Area occurred in Subtidal habitat in Salem Sound. The second most impacted habitat was Salt Marsh in Scituate (11% of total impacts). The third most impacted habitat was Subtidal/Intertidal impacts in Boston Harbor (2% of total impacts). The proposed project will create 0.5 or more acres of Essential Fish Habitat (EFH) in the Subtidal habitat in Salem Sound and Boston Harbor, both of which are within the Coastal Service Area.

The benefits of creating new eelgrass beds can be realized beyond these areas due to the reproductive physiology of the plant. Typically in the plant's second growing season, eelgrass shoots become reproductive when temperature conditions are suitable (early to mid-summer). The reproductive shoot, holding dozens of seeds, is released and floats for a month or more before dropping its seeds (Källström et al 2008), which sink to the bottom. If seeds are transported to suitable habitats, new beds can form.

Criterion 5) Cost of Implementing and Maintaining the Project

DMF has provided a detailed budget for this proposal to demonstrate that we will accomplish the required acreage in the first year, with plantings to augment and fill in any losses in the second year. Our budget includes five years of monitoring, beginning in the first year. Although eelgrass restoration is relatively expensive when compared to terrestrial projects, DMFs experience and in-house capabilities maximize efficiency. Furthermore, planting eelgrass is one of the best options for restoring and improving subtidal habitat.

All proposed eelgrass restoration sites are located in shallow subtidal waters that are tidelands owned by and subject to the regulatory jurisdiction of the Commonwealth. Where, as here, a Commonwealth agency is restoring habitat on Commonwealth tidelands, there are no available and appropriate legal instruments to preserve such tidelands from further development. For example, DMF obtaining a Chapter 91 License would not be appropriate because the proposed eelgrass restoration activity does not involving the filling or placement of structures in Commonwealth tidelands. However, to put this situation in context and perspective, because the distances of the proposed restoration sites from shoreline, navigation channels, and other regulated uses (pipelines, cable crossings, etc.), there is a low risk of site use for future development at these locations. All commercial fishing activity utilizing mobile gear (trawls, seines, or other similar devises including scallop dredging) is closed by regulation in both the Boston Harbor and Salem Sound embayments. The activity with the greatest potential for development in the proposed restoration area is bottom-oriented shellfish aquaculture. Any proposed aquaculture activity requires a permit from DMF. Moreover, both of DMF's proposed

eelgrass restoration sites are located in Designated Shellfish Growing Areas (DSGAs) classified by DMF as "Prohibited" for shellfish harvest in accordance with National Shellfish Sanitation Program (NSSP) water quality standards. As stated in DMF's *Shellfish Planting Guidelines, 3rd Edition* (footnote 1, p.7), DMF "does not support shellfish planting activities that create new, self-sustaining populations in Prohibited or Restricted waters due to the risk of attractive nuisance and other enforcement and public health concerns." In short, absent a municipal contaminated shellfish area management plan approved by DMF's Director, no such aquaculture would be allowed within DMF's proposed eelgrass restoration areas in Boston Harbor and Salem Sound. As a practical matter, the likelihood that either the City of Boston or the City of Salem would propose such a contaminated shellfish area management plan or that DMF would approve them is highly unlikely for the foreseeable future. Finally, in the unlikely event that a project proponent proposed activities that had an adverse impact to DMF's proposed eelgrass restoration sites, mitigation would be required through the applicable federal and state permitting processes.

The ongoing restoration and protection of important marine habitats is an integral part of DMF's mission, as highlighted in multiple strategies of DMF's Strategic Plan (see Goal 1, Goal 3, Goal 4, Goal 5, Goal 6). Over the past decade, DMF has developed an eelgrass program that includes its own restoration, monitoring, management efforts, providing review and comment during the federal and state environmental review processes on projects that may affect eelgrass habitat, and establishing partnerships with other academic, non-profit, and government agencies interested in advancing eelgrass research and restoration.

Thus, this proposed eelgrass restoration project arises out of DMF's larger eelgrass program and reflects DMF's commitment to continue to further its long-term stewardship of eelgrass in the Commonwealth. Consequently, DMF's restoration, monitoring, management efforts are expected to continue beyond the proposed eelgrass plantings and minimum 5 year follow-up monitoring timeframe for this project. The progression and long term health of these proposed eelgrass restoration sites will inform future eelgrass protection and restoration efforts in the Commonwealth. In conclusion, DMF is making a long term commitment to the success of all of its eelgrass program efforts, including this eelgrass restoration project to be funded by ILF payments.

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ATTACHMENT A BUDGET FOR DMF ILFP EELGRASS RESTORATION PROJECT					
Equipment and Supplies					
Calendar Year:	**2017**	**2018**	**2019**	**2020**	**2021**
SCUBA air tank fills (with SeagrassNet)	$3,348	$3,348	$1,620	$1,620	$1,620
Field Supplies (screw anchors, transect tapes, floats, line, burlap)	$1,200	$500	$500	$500	$500
Licor sensors	$560				
Boat fuel and maintenance	$7,750	$7,750	$3,750	$3,750	$3,750
Dive Gear and maintenance as needed	$1,000	$1,000	$1,000	$1,000	$1,000
Humminbird acoustic instrument and Sonar TRX software	$1,200				
Lab work (eelgrass genetics)	$5,000	$5,000			
Permitting	$440	$440			
Personnel					
Dive pay 3 divers (including SeagrassNet)	$13,950	$13,950	$6,750	$6,750	$6,750
payroll on dive pay	$232	$232	$112	$112	$112
indirect on dive pay	$3,613	$4,673	$2,261	$2,261	$2,261
Fisheries Supervisor (Jill) (field and office)	$5,193	$5,387	$2,514	$2,514	$2,514
Indirect	$1,345	$1,395	$651	$651	$651
fringe	$1,740	$1,805	$842	$842	$842
payroll	$86	$89	$42	$42	$42
Fisheries Supervisor (Kate) (field and office first two years)	$5,062	$5,387	$1,400	$1,400	$1,400
Indirect	$1,311	$1,395	$363	$363	$363
fringe	$1,696	$1,805	$469	$469	$469
payroll	$84	$89	$23	$23	$23
Contract Seasonal (full time@ $16/hr x52 weeks, first two years)	$33,280	$33,280			
Indirect	$8,620	$8,620			$
payroll	$549	$549			
Travel (mileage reimbursement)	$250	$250	$250	$250	$250
Sub-total:	$74,346	$73,782	$41,834	$41,834	$41,834
Total Project Cost:	**$262,092**				
DMF Match					
Personnel - (total of 20 days each year of 2 EA II's time)	$5,610	$5,610	$5,610	$5,610	$5,610
Indirect	$1,453	$1,453	$1,453	$1,453	$1,453
fringe	~~$1,880~~	~~$1,880~~	~~$1,880~~	~~$1,880~~	~~$1,880~~
payroll	$93	$93	$93	$93	$93
Acoustic mapping (equipment use, technician time)	$800	$800	$800	$800	$800
SD Card and external hard drive for data management	$300				
Match Sub-total:	$10,136	$9,836	$9,836	$9,836	$9,836
Total Match:	**$49,481**				

MA DFG In-Lieu Fee Program

Division of Marine Fisheries (DMF) Eelgrass Restoration Project

Credit Release Schedule

40% of the credits will be released upon the completion of project plantings

As proposed by DMF, planting 1/4 acre of eelgrass will occur at two sites (Boston Harbor and Salem Sound) over a two (2) year period. While DMF's plan is to plan a 1/4 acre of eelgrass at each of the above sites, an outcome may be that DMF is unsuccessful at planting a full ¼ acre at one site, but has planted more than ¼ acre at the other site. For the purposes of this Schedule milestone, the release of 40% of the credits will occur upon DMF's successful planting of a total of ½ acre as between the two sites, with the % credits attributable to each site shown in RIBITS as two separate entries.

10% of the credits will be released at the completion of each year of a five year monitoring program once each monitoring report has been reviewed and approved by the Corps in consultation with the IRT

Following the completion of the eelgrass plantings at the above two locations, DMF will monitor these restoration sites for a five (5) year period. As discussed in more detail in DMF's project description, the restoration sites will compared to measureable values (shoot density, % cover, canopy height) at reference sites. 10% of the credits will be released at the completion of each year of monitoring, as documented by DMF's monitoring report for that year.

The final 10% of the credits will be released after DMF determines, with the approval of the Corps in consultation with the IRT, that the project has successful met the performance standards.

DMF expects that within three years of the completion of the plantings, the restoration sites are expected to be on a trajectory to reach restoration targets, and after five years the restoration target should be met. Restoration target is ½ total acres transplanted across two sites, with a shoot density, % cover and canopy height statistically equivalent to reference levels as discussed in more detail in DMF's project description.

If, at the time of the final 10% sign-off, DMF has successfully restored more than the required ½ acre as between the two sites in accordance with the success criteria in DMF's project description, DMF may request to be granted additional credit(s) for the larger area restored, subject to the approval of the Corps in consultation with the IRT.

Credit Release Schedule		
	Credit release (%)	**Completed activity/deliverable**
Project planting (years 1 & 2)	40%	½ acre transplanted eelgrass (as proposed, across two sites) – progress report and maps
Monitoring year 1	10%	Year 1 monitoring report
Monitoring year 2	10%	Year 2 monitoring report
Monitoring year 3	10%	Year 3 monitoring report
Monitoring year 4	10%	Year 4 monitoring report
Monitoring year 5	10%	Year 5 monitoring/Final Report – including proposed hydroacoustic mapping results
Final sign off	10%	DMF and the Corps agreed that project performance standards have been met