PUBLIC NOTICE

US Army Corps
of Engineers ®
New England District
696 Virginia Road
Concord, MA 01742-2751

Comment Period Begins: 06/15/2021
Comment Period Ends: 07/15/2021
File Number: NAE-2007-02926
In Reply Refer To: Ruth Brien
Phone: (978) 318-8054
E-mail: ruthann.a.brien@usace.army.mil

SUBJECT: This notice announces a request to modify the Commonwealth of Massachusetts In-lieu Fee ("ILF") Program Instrument with the addition of four individual projects.

ILF PROGRAM SPONSOR: Department of Fish and Game
251 Causeway Street, Suite 400
Boston, Massachusetts 02114

BACKGROUND: The Department of Fish and Game is the sponsor of the Massachusetts ILF Program which serves as an alternative form of compensatory mitigation for aquatic resource impacts. The Massachusetts ILF program is authorized by the New England District, Army Corps of Engineers (the "Corps"). A copy of the signed ILF agreement entitled "Commonwealth of Massachusetts Final In-Lieu Fee Program Instrument" dated May 23, 2014, includes details about the ILF Program goals and objectives in general and can be found at the following link:
https://www.nae.usace.army.mil/Portals/74/docs/regulatory/Mitigation/MA/MAILFInstrument.pdf

Four projects have been submitted as proposed additions to the ILF Instrument pursuant to 33 CFR 332, Compensatory Mitigation for Losses of Aquatic Resources (Federal Register: April 10, 2008, effective June 9, 2008). Pursuant to 33 CFR 332.8 (d), the District Engineer will provide public notice of the proposed addition of ILF program mitigation sites. As such, we are issuing a public notice to solicit comments for the instrument modification due to the proposed addition of ILF mitigation sites.

The Massachusetts ILF Program accrued funds from Army Corps of Engineers Department of the Army permitted impacts throughout the State of Massachusetts. The Massachusetts ILF Program announced the availability of funds remaining after a previous grant process to eligible entities that work on the preservation, restoration and enhancement of wetland and watercourse resources and associated upland buffers in the State of Massachusetts. The District Engineer has received four proposed projects from various applicants who have applied for this funding under the ILF Program.

PURPOSE: These four proposed projects would provide compensatory wetland and stream mitigation for permitted impacts in the following service areas: Coastal South Service Area, Coastal Central Service Area, and Coastal North Service Area.

GENERAL INFORMATION: An ILF program involves the restoration, establishment, reestablishment, enhancement, rehabilitation and/or preservation of aquatic resources through funds paid to a governmental or non-profit natural resources management entity to satisfy compensatory mitigation requirements for Department

of the Army permits. Similar to a mitigation bank, an ILF program sells compensatory mitigation credits to permittees whose obligation to provide compensatory mitigation is then transferred to the ILF program sponsor. The operation and use of an ILF program are governed by an ILF program instrument. A group of federal and state regulatory and resource agency representatives known as the Interagency Review Team (IRT) oversees the establishment and management of the program. The IRT is chaired by the U.S. Army Corps of Engineers (Corps). The primary role of the IRT is to facilitate the establishment of the ILF program through the development of an ILF Instrument. The IRT also reviews ILF mitigation proposals and provides comments to the Corps. The approval of the use of the ILF program for specific projects is the decision of the Corps pursuant to Section 10 of the Rivers and Harbors Act of 1899 and/or Section 404 of the Clean Water Act (CWA). The Corps provides no guarantee that any particular individual or general permit proposing to use the ILF program for compensation mitigation will be authorized.

PROJECT DESCRIPTION: The sponsors have submitted maps showing the locations of the projects with their respective prospectuses. Additionally, the draft mitigation plans are available to be reviewed upon request.

ESSENTIAL FISH HABITAT: The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires all federal agencies to consult with the National Marine Fisheries Service on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat (EFH). Essential Fish Habitat describes waters and substrate necessary for fish for spawning, breeding, feeding or growth to maturity.

The District Engineer has made a preliminary determination that the site-specific adverse effect from the four projects will not be substantial. Further consultation with the National Marine Fisheries Service regarding EFH recommendations will be conducted as necessary and will be concluded prior to the final decision.

NATIONAL HISTORIC PRESERVATION ACT: Based on his initial review, the District Engineer has determined that none of the four projects may affect properties in, or eligible for listing in, the National Register of Historic Places. Additional review and consultation to fulfil requirements under Section 106 of the National Historic Preservation Act of 1966, as amended, will be ongoing as part of the proposal review process and the permit review process for those requiring Corps authorization.

ENDANGERED SPECIES CONSULTATION: The New England District, Army Corps of Engineers, has reviewed the list of species protected under the Endangered Species Act of 1973, as amended, that might occur at the project sites. It is our preliminary determination that the proposed projects are situated or will be operated/used in such a manner that they are not likely to adversely affect any federally listed endangered or threatened species or their designated critical habitat. By this Public Notice, we are requesting that the appropriate federal agency concur with our determination.

EVALUATION: After the end of the comment period, the District engineer will review all comments received and make an initial determination as to the potential of the proposed projects to provide compensatory mitigation for activities authorized by DA permits. That determination will reflect the national concern for both protection and utilization of important resources. The benefits, which reasonably may be expected to accrue from the proposals, must be balanced against their reasonably foreseeable detriments. Factors relevant to the proposals will be considered including conservation, economics, aesthetics, general environmental concerns, wetlands, historical properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation,

shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food, and fiber production, mineral needs, considerations of property ownership, and in general, the needs and welfare of the people.

The Corps is soliciting comments from the public; Federal, State, and local agencies and officials; American Indian Tribes; and other interested parties in order to consider and evaluate the proposed activities. All comments received will be considered by the Corps during the formulation of the initial determination of potential for the proposed activities.

COMMENTS: 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 the above date. If you have any questions, please contact Ms. Ruth Brien at (978) 318-8054, (800) 343-4789 or (800) 362-4367, if calling from within Massachusetts.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider the proposed projects. Requests for a public hearing shall specifically state the reasons for holding a public hearing. The Corps holds public hearings for the purpose of obtaining public comments when that is the best means for understanding a wide variety of concerns from a diverse segment of the public.

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.

THIS NOTICE IS NOT AN AUTHORIZATION TO DO ANY WORK.

Paul Maniccia

Paul Maniccia
Chief, Permits and Enforcement Branch
Regulatory Division

If you would prefer not to continue receiving Public Notices by email, please contact Ms. Tina Chaisson at (978) 318-8058 or e-mail her at bettina.m.chaisson@usace.army.mil.

MA In-Lieu Fee Program, Draft Project Prospectus

Barnstable Great Marsh Restoration

ILF Program (ILFP) Sponsor: Massachusetts Department of Fish and Game (MA DFG)
Project Sponsor: Mass Audubon Society, Inc.
Project Location: Barnstable, MA Coastal-Central ILF Service Area

(i) The objectives of the proposed ILF project.

The goal of this project includes three objectives:

1) To design and monitor restoration of 74 acres of existing protected salt marsh habitat through ditch remediation that restores marsh hydrology, reverses marsh subsidence, and promotes natural accretion that keeps pace with sea level rise (SLR);

2) To document ditch remediation as a salt marsh restoration and climate adaptation strategy for Cape Cod, Massachusetts, and the Northeastern United States so that land trusts, municipalities and other restoration practitioners may learn from the experiences implementing this project;

3) To protect high marsh habitat from the impacts of sea level rise and preserve these areas for wildlife such as the saltmarsh sparrow that depend on these habitats for survival.

Ditch remediation has been successfully permitted, implemented, and practiced on the North Shore of Massachusetts as part of an ongoing pilot project to restore several hundred acres of salt marsh that is being undertaken by the Trustees of Reservations in partnership with the University of New Hampshire (UNH), and the US Fish and Wildlife Service (USFWS). Results of this technique have been published in peer-viewed journals (Burdick et al., 2020). Results showed that the use of this technique lead to significantly shallower ditches and plant colonization within ditches after the second year of treatment (Burdick et al., 2020). The project proposed in this Prospectus will expand the use of the ditch remediation technique to the Cape Cod area in southern Massachusetts and benefit from lessons learned in implementing similar North Shore projects. Mass Audubon will be consulting with the Trustees of Reservations, UNH, and USFWS to benefit from their experience in implementing and monitoring the ditch remediation technique.

(ii) How the ILF project will be established and operated.

Mass Audubon will lead the project, which will be managed by Climate Adaptation Ecologist, Dr. Danielle Perry. Mass Audubon plans to contract services for permitting and design work. Monitoring will be completed by Dr. Perry and Mass Audubon field staff in consultation with UNH staff who monitored The Trustees' ditch remediation project on the North Shore. Reference sites, which may include the Trustees ditch remediation site at Old Town Hill in Newbury, MA will be selected and used to establish ecological performance standards. Mass Audubon will work with the BSC Group for permitting services which they expect to complete in Year 1 of the project. For project design, Mass Audubon will contract Northeast Wetland Restoration to complete a ditch remediation design for the 74-acre property, also expected to be completed in Year 1. Implementation is expected to proceed in Year 2 after baseline monitoring to occur in Year 1. Mass Audubon will complete and submit annual monitoring for a 5-year period after

ditch remediation. Implementation and ditch remediation is expected to be completed by Northeast Wetland Restoration, Mass Audubon staff, and volunteers. Some ditches are expected to need periodic treatments over a 3-year period.

(iii) The proposed ILF service area.

The project site is located in the MA ILFP Coastal Central Service Area.

(iv) The general need for and technical feasibility of the proposed ILF project.

Climate change and other anthropogenic impacts have lowered the resiliency of Northeast coastal marshes. Due to increased coastal development, reduced sediment supplies (caused by urbanization, dam construction, and reforestation), and accelerating rates of SLR, marshes are not able to migrate or accrete at a rate fast enough to withstand SLR impacts (Sallenger et al., 2012). Historic human impact, such as ditch creation, has also lowered salt marsh resiliency increasing susceptibility to sea level rise, shown to prevent marsh drainage due to ditch clogging, and promote marsh subsidence (Burdick et al. 2020). As a result of these impacts, Northeast salt marshes have suffered from increased dieback areas, vegetation loss, peat subsidence, and ponding (Raposa et al., 2017). These combined effects further decrease salt marsh resiliency to storms and climate change impacts, which the Northeast is particularly susceptible to (Crotty et al., 2017). Restoration efforts such as ditch remediation are valuable management strategies to enhance the resilience of salt marshes to SLR and prevent further subsidence.

The project goal is to restore 74 acres of salt marsh by reducing the number and linear feet of ditches through the ditch remediation method. Work will be conducted strategically to replicate natural hydrology, restoring marsh health and its ability to keep pace with SLR through reversing marsh subsidence and increasing accretion rates. This low-risk method involves the harvesting of the high marsh plant, saltmarsh hay, adjacent to ditches and its placement in selected ditch bottoms where it is secured with twine. After initial implementation the ditches will be treated as needed and will be able to sequester suspended sediment from incoming tides. The result is accelerated natural ditch filling producing accretion material that closely resembles salt marsh peat. As the ditch bottom is elevated, natural salt marsh vegetation colonizes and completes the restoration of the ditches, stopping excessive draining and marsh subsidence. Some ditches will remain to ensure proper hydrology that more closely replicates the natural flooding and draining needed by salt marshes to grow and keep pace with SLR. Restoration is expected to require multiple treatments for some ditches over 3 years. Mass Audubon will contract the Northeast Wetlands Restoration to implement the ditch remediation project, which is the same contractor that completed the ditch remediation project within the Great Marsh on the North Shore.

This salt marsh restoration project habitat will benefit multiple waterfowl species (American black ducks, mallards, and other migratory duck species), wading birds, and shorebirds directly by providing restored breeding and wintering habitat. The saltmarsh sparrow, listed as a Species of Concern, will particularly benefit as ditch remediation will restore high marsh habitat, where saltmarsh sparrows nest exclusively.

(v) The proposed ownership arrangements and long-term management strategy for the in-lieu fee project site(s).

Mass Audubon owns the property where the project will take place, and will hold long-term management responsibilities for the site. The project does not rely on structures that require maintenance and is designed to achieve a self-sustaining state within the range of environmental conditions typical of New England salt marshes. A Long-Term Management Plan, subject to Corps approval, will be established for the site.

(vi) The qualifications of the Project Sponsor and any contractor/third-party to successfully complete the type of mitigation project proposed, including information describing any past such activities by the Project Sponsor and contractor/third-party.

Project Sponsor Experience

Mass Audubon has demonstrated its leadership with completing projects to build climate change resiliency including multiple dam removals and restoration of uplands; salt marshes—including an ongoing salt marsh hydrological restoration project at Mass Audubon's Allens Pond Wildlife sanctuary; and freshwater marshes—Mass Audubon's Tidmarsh Wildlife Sanctuary is home to the largest freshwater restoration in the state. Also, Dr. Perry, Mass Audubon's Climate Adaptation Ecologist (project manager for this project), has about 10 years of experience in salt marsh research in New England including planning and implementing salt marsh climate change adaptation and restoration projects. Dr. Perry also collaborates with the Great Marsh partners on ongoing salt marsh resiliency project utilizing techniques such as ditch remediation, runnels, and invasive species control.

Project Design Partner Experience

Geoffrey Wilson from Northeast Wetland Restoration will lead the design and implementation work for this project in consultation with Dr. Susan C. Adamowicz from USFWS, drawing on their experience designing and implementing the North Shore ditch remediation technique. Geoffrey Wilson has 28 years of ecological restoration design experience and is currently working with USFWS on nature-based solutions to restore coastal resiliency and tidal marsh dependent species habitat in coastal marshes from Maine to Maryland. Dr. Adamowicz is the Land Management Research and Demonstration Biologist of the US Fish and Wildlife Service stationed at the Rachel Carson National Wildlife Refuge in Wells, Maine and she works throughout the Northeast. With over 25 years' experience in wetland regulation and restoration, her work now focuses on innovative methods to restore tidal marshes and control invasive plants.

Monitoring Partner Experience

Dr. David Burdick, Research Associate Professor of Coastal Ecology at UNH, will be consulting on project monitoring (project monitoring lead for the Trustees ditch remediation project). The collaboration with Dr. Burdick will ensure that monitoring techniques used for this project will be comparable to the Trustees project, strengthening the evidence of the effectiveness of this restoration technique. His study of coastal science spans 35 years, concentrating on coastal ecosystems, assessing human impacts, and planning, implementing and monitoring habitat restoration at the Jackson Estuarine Laboratory, where he serves as Director.

References

Burdick, D.M., Moore, G.E., Adamowicz, S.C., Wilson, G.M., Peter, C.R., 2020. Mitigating the Legacy Effects of Ditching in a New England Salt Marsh. Estuaries and Coasts. https://doi.org/10.1007/s12237-019-00656-5

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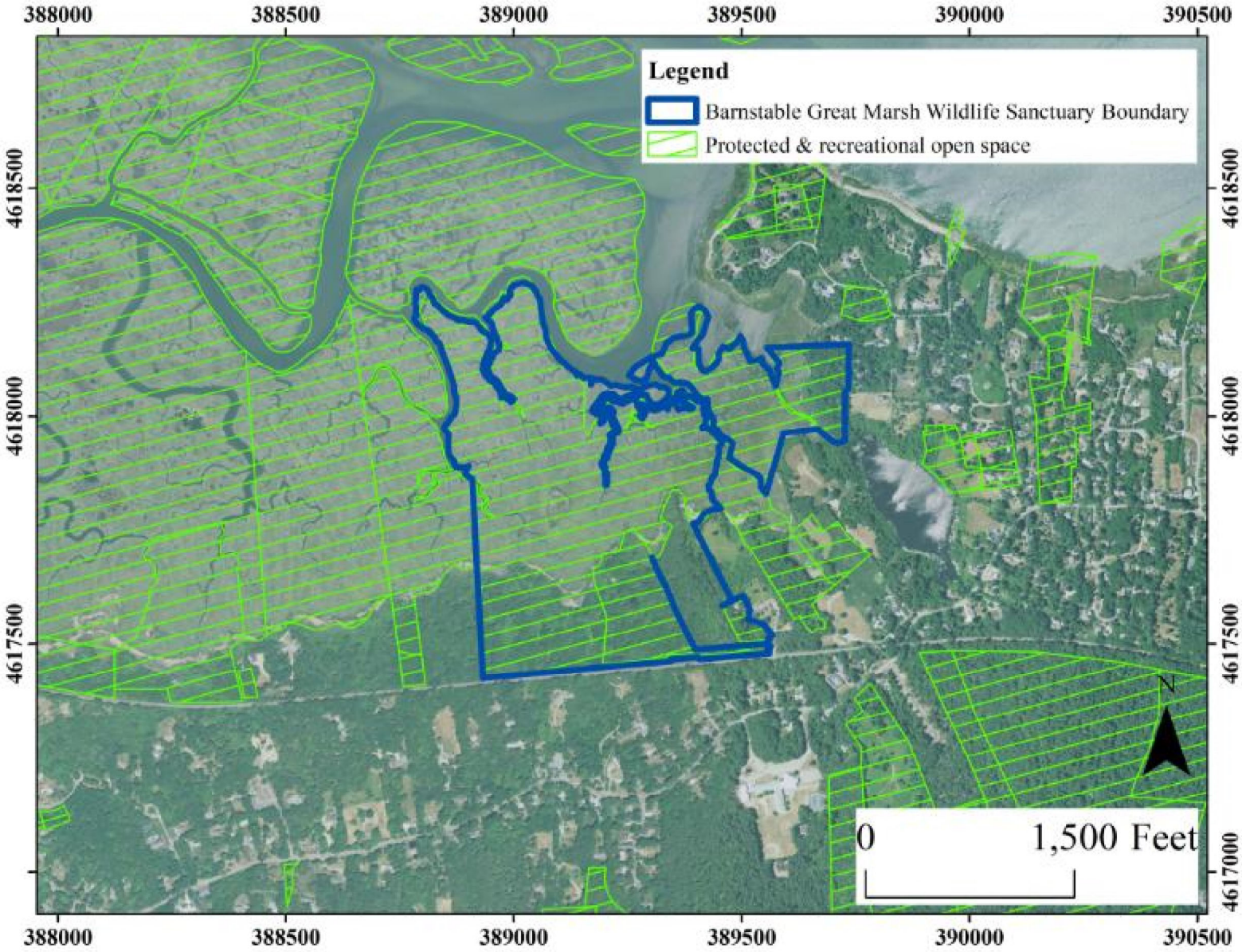
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Legend
Barnstable Great Marsh Wildlife Sanctuary Boundary
Protected & recreational open space
N
0
1,500 Feet

MA In-Lieu Fee Program, Draft Project Prospectus

Rough Meadows Marsh Restoration

ILF Program (ILFP) Sponsor: Massachusetts Department of Fish and Game (MA DFG)
Project Sponsor: Mass Audubon Society, Inc.
Project Location: Rowley, MA Coastal-North ILF Service Area

(i) The objectives of the proposed ILF project.

The goal of this project includes three objectives:

1) To design and monitor restoration of 203 acres of existing protected salt marsh habitat through ditch remediation, runnel implementation, and invasive species control that restores marsh hydrology, reverses marsh subsidence, promotes plant recolonization, enhances marsh drainage, and promotes natural accretion that keeps pace with sea level rise (SLR);

2) To document ditch remediation as a salt marsh restoration and climate adaptation strategy for the Great Marsh within the North Shore of Massachusetts, and Northeastern United States so that land trusts, municipalities and other restoration practitioners may learn from the experiences implementing this project;

3) To protect high marsh habitat from the impacts of sea level rise and preserve these areas for wildlife such as the saltmarsh sparrow that depend on these habitats for survival.

Rough Meadows is a 203-acre property that consists of 144 acres of Mass Audubon land and 49 acres of Greenbelt and abutting land trust and privately-owned land. Mass Audubon, as the Project Sponsor, will complete project design and restoration work on the 203-acre property. Ditch remediation has been successfully permitted, implemented, and practiced on the North Shore of Massachusetts as part of an ongoing pilot project that is being undertaken by the Trustees of Reservations (Trustees), in partnership with the University of New Hampshire (UNH), and the US Fish and Wildlife Service (USFWS). Results of this technique have been published in peer-reviewed journals (Burdick et al., 2020). The proposed expansion of the North Shore project, to restore several hundred acres of salt marsh, includes the addition of micro-runneling techniques. An Environmental Impact Report for the North Shore project expansion has been submitted and reviewed under the Massachusetts Environmental Policy Act (MEPA) and the project expansion is in the permitting stage. The ILF project at Mass Audubon's Rough Meadows Wildlife Sanctuary proposes to expand the use of ditch remediation and micro-runneling techniques techniques in the Great Marsh, an Area of Critical Environmental Concern, and benefit from lessons learned during implementation of the North Shore projects. Mass Audubon will be consulting with the Trustees, UNH, and USFWS to benefit from their experience in implementing and monitoring the ditch remediation and runnel techniques.

(ii) How the ILF project will be established and operated.

Mass Audubon will lead the project, which will be managed by Climate Adaptation Ecologist, Dr. Danielle Perry. Mass Audubon will contract for permitting and design services. Monitoring will be completed by Dr. Perry and Mass Audubon field staff in consultation with UNH staff who monitored The Trustees'

ditch remediation project at Old Town Hill in Newbury, MA. Reference sites, which may include the Old Town Hill site, will be selected and used to establish ecological performance standards. Mass Audubon will contract with Rimmer Environmental to complete the project permitting, expected to take a year, and during this time Mass Audubon plans to complete the baseline monitoring and project design. For project design, Mass Audubon will contract with Northeast Wetland Restoration to complete the ditch remediation and runnel design for the 203-acre property during Year 1 of the project. During Year 1, Mass Audubon will also inventory stands of invasive common reed (*Phragmites australis*). An invasive species control plan will be developed by a company specializing in common reed control in wetlands and submitted to the ILF Program for review prior to implementation. Implementation is expected to proceed in Year 2 after baseline monitoring and permitting in Year 1. Mass Audubon will complete monitoring for a 5-year period and submit a final monitoring report after the 5th year. Implementation of ditch remediation and runnels are expected to be completed by Northeast Wetland Restoration, Mass Audubon staff, and volunteers. Some ditches are expected to need periodic treatments over a 3-year period. The first two years of invasive species control will be contracted to a company specializing in common reed control in wetlands. Subsequent treatments will be performed on a need basis by Mass Audubon staff. Phragmites is present on the salt marsh upland edge in the intended restoration area, and with treatment this barrier to salt marsh migration will be mitigated. The hydrological restoration will also impede Phragmites for a holistic high marsh restoration strategy.

Mass Audubon is currently working with property owners for the appropriate agreements to complete restoration on the 49-acres of Rough Meadows not owned by Mass Audubon. These agreements will be included with the draft mitigation plan.

(iii) The proposed ILF service area

The project site is located in the MA ILFP Coastal North Service Area.

(iv) The general need for and technical feasibility of the proposed ILF project.

Climate change and other anthropogenic impacts have lowered the resiliency of Northeast coastal marshes. Due to increased coastal development, reduced sediment supplies (caused by urbanization, dam construction, and reforestation), and accelerating rates of SLR, marshes are not able to migrate or accrete at a rate fast enough to withstand SLR impacts (Sallenger et al., 2012). Historic human impact, such as ditch creation, has also lowered salt marsh resiliency increasing susceptibility to sea level rise, prevented marsh drainage due to ditch clogging, and promoted marsh subsidence (Burdick et al. 2020). As a result of these impacts, Northeast salt marshes have suffered from increased dieback areas, vegetation loss, peat subsidence, and ponding (Raposa et al., 2017). These combined effects further decrease salt marsh resiliency to storms and climate change impacts, which the Northeast is particularly susceptible to (Crotty et al., 2017). Restoration efforts like ditch remediation and runnel implementation are valuable management strategies to enhance the resilience of salt marshes to sea level rise impacts, prevent any further marsh subsidence, enhance salt marsh accretion, and promote vegetation recolonization. Another threat to the salt marsh is the presence of the invasive common reed (*Phragmites australis*), located along the border of the salt marsh. Common reed outcompetes native plant species, disrupts biogeochemical cycles, creates a barrier to salt marsh migration, and diminishes habitat quality for many species relying on the salt marsh.

This proposed ILF project will use runnels and ditch remediation to enhance the resiliency of Rough Meadows Wildlife Sanctuary. Runnels are shallow channels (less than 1ft wide and deep) used to drain water impoundments that form on the marsh surface. Ditch remediation will be completed by reducing the number and linear feet of ditches through the ditch remediation method. Runnels will be used to drain water impoundments that have formed within the high marsh due to sea level rise impacts. Work will be conducted strategically to replicate natural hydrology, restoring marsh health and its ability to keep pace with SLR through reversing marsh subsidence and increasing accretion rates. The low-risk ditch remediation method involves the harvesting of saltmarsh hay adjacent to ditches and its placement in selected ditch bottoms where it is secured with twine. After initial implementation the ditches will be treated as needed and will be able to sequester suspended sediment from incoming tides. The result is accelerated natural ditch filling producing accretion material that closely resembles salt marsh peat. As the ditch bottom is elevated, natural salt marsh vegetation colonizes and completes the restoration of the ditches, stopping excessive draining and marsh subsidence. Some ditches will remain to ensure proper hydrology that more closely replicates the natural flooding and draining needed by salt marshes to grow and keep pace with SLR. Restoration is expected to require multiple treatments for some ditches over 3 years. These restoration efforts are also expected to help prevent further expansion of Phragmites due the restoration of natural hydrology. Mass Audubon will also use mechanical and chemical control of this invasive to supplement the impacts of restored hydrology. Removal of Phragmites will improve the marsh ecosystem and aid salt marsh migration as the sea level rises.

Runnels drain standing water into nearby creeks or ditches and enhance drainage particularly within high marsh areas where standing water is causing vegetation loss. Runnels are created through hand digging or an excavator. Mass Audubon will primarily be using hand shovels to create the runnels, and only use an excavator if necessary. The drainage that runnels provide alleviate flooding stress and promote vegetation recolonization. Mass Audubon will contract with Northeast Wetlands Restoration to implement and for construction of the ditch remediation and runnel techniques.

This salt marsh resiliency project will benefit multiple waterfowl species (American black ducks, mallards, and other migratory duck species), wading birds, and shorebirds directly by providing restored breeding and wintering habitat. The saltmarsh sparrow, which is a species of concern, will particularly benefit as ditch remediation and runnel implementation will restore high marsh habitat, where saltmarsh sparrows nest exclusively.

(v) The proposed ownership arrangements and long-term management strategy for the in-lieu fee project site(s).

Mass Audubon owns 144-acres of the property and will hold long-term management responsibilities for the site. Mass Audubon is working with property owners for the appropriate agreements to complete and monitor restoration on the 49-acres of Rough Meadows that is not owned by Mass Audubon. These agreements will be included with the draft mitigation plan.

The project does not rely on structures that require maintenance and is designed to achieve a self-sustaining state within the range of environmental conditions typical of New England salt marshes. A Long-Term Management Plan, subject to Corps approval, will be established for the site.

(vi) The qualifications of the Project Sponsor and any contractor/third-party to successfully complete the type of mitigation project proposed, including information describing any past such activities by the Project Sponsor and contractor/third-party.

Project Sponsor Experience

Mass Audubon has demonstrated its leadership with completing projects to build climate change resiliency including multiple dam removals and restoration of uplands; salt marshes—including an ongoing salt marsh hydrological restoration project at Mass Audubon's Allens Pond Wildlife Sanctuary; and freshwater marshes—Mass Audubon's Tidmarsh Wildlife Sanctuary is home to the largest freshwater restoration in the state. Also, Mass Audubon's Climate Adaptation Ecologist (project manager for this project), has 10 years of experience in salt marsh research in New England including planning and implementing salt marsh climate change adaptation and restoration projects. She also collaborates with the Great Marsh partners on ongoing salt marsh resiliency project utilizing techniques such as ditch remediation, runnels, and invasive species control.

Project Design Partner Experience

Geoffrey Wilson from Northeast Wetland Restoration will lead the design and implementation work for this project in consultation with Dr. Susan C. Adamowicz from USFWS, drawing on their experience designing and implementing the North Shore ditch remediation technique. Geoffrey Wilson has 28 years of ecological restoration design experience and is currently working with USFWS on nature-based solutions to restore coastal resiliency and tidal marsh dependent species habitat in coastal marshes from Maine to Maryland. Dr. Adamowicz is the Land Management Research and Demonstration Biologist of the US Fish and Wildlife Service stationed at the Rachel Carson National Wildlife Refuge in Wells, Maine and she works throughout the Northeast. With over 25 years' experience in wetland regulation and restoration, her work now focuses on innovative methods to restore tidal marshes and control invasive plants.

Monitoring Partner Experience

Dr. David Burdick, Research Associate Professor of Coastal Ecology at UNH, will be consulting on project monitoring (he led the project monitoring for the Trustees ditch remediation project). The collaboration with Dr. Burdick will ensure that monitoring techniques used for this project will be comparable to the Trustees project, strengthening the evidence of the effectiveness of this restoration technique. His study of coastal science spans 35 years, concentrating on coastal ecosystems, assessing human impacts, and planning, implementing and monitoring habitat restoration at the Jackson Estuarine Laboratory, where he serves as Director.

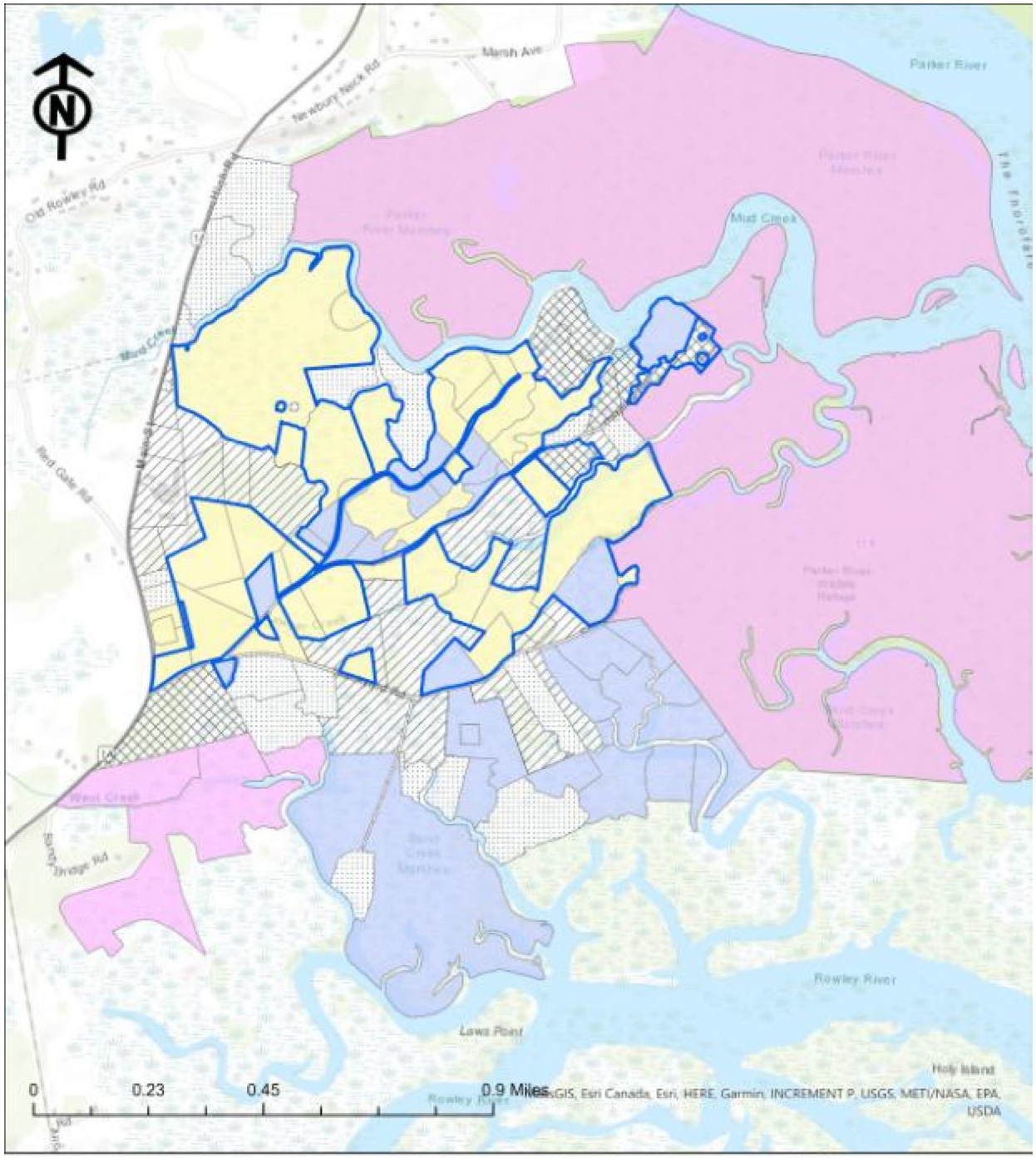
References

Burdick, D.M., Moore, G.E., Adamowicz, S.C., Wilson, G.M., Peter, C.R., 2020. Mitigating the Legacy Effects of Ditching in a New England Salt Marsh. Estuaries and Coasts. https://doi.org/10.1007/s12237-019-00656-5

Crotty, S.M., Angelini, C., Bertness, M.D., 2017. Multiple Stressors and the Potential for Synergistic Loss of New England Salt Marshes. PloS One. https://doi.org/10.1371/ journal.pone.0183058.

Raposa, K.B., Weber, R.L.J., Ekberg, M.C., Ferguson, W., 2017b. Vegetation dynamics in Rhode Island salt marshes during a period of accelerating sea level rise and extreme sea level events. Estuaries and Coasts 40, 640–650. https://doi.org/10.1007/s12237-015- 0018-4

Sallenger, A.H., Doran, K.S., Howd, P.A., 2012. Hotspot of accelerated sea-level rise on the Atlantic coast of North America. Nat. Clim. Chang. 2, 884–888. https://doi.org/10.1038/nclimate1597



Mass Audubon and Greenbelt's Rough Meadows Wildlife Sanctuary

Rough Meadows Properties

- Private property
- Government
- Trust
- Mass Audubon
- Greenbelt
- Mass/GB CR

Rough Meadows Sanctuary Boundary

- Rough Meadows Sanctuary Boundary

Greenbelt
Essex County's Land Trust

Mass Audubon

MA In-Lieu Fee Program, Project Prospectus

Pye Brook and Hood Pond Wetlands Restoration

ILF Program (ILFP) Sponsor: Massachusetts Department of Fish and Game (MA DFG)
Project Sponsor: Ipswich River Watershed Association.
Project Location: Topsfield and Ipswich, MA Coastal-North ILF Service Area

(i) The objectives of the proposed ILF project.

The primary objective of this ILF project is to restore, enhance and sustain a rich complex of palustrine and lacustrine wetlands in the Pye Brook system in Topsfield and Ipswich, MA. The project will address two hydraulic barriers in the Pye Brook sub watershed, an ecologically important tributary of Howlett Brook and the Ipswich River. Removal of these barriers will restore hydrologic and biologic connectivity, restore natural hydrologic conditions to upstream wetlands, maintain the restored hydrological regime over time and increase natural capacity to retain and infiltrate floodwaters. Barrier removal will support restoration of fish passage, including eastem brook trout and river herring, building on other restoration efforts in the watershed, including an ILFP-funded fishway on the Ipswich River at the Willowdale Dam.

The project consists of the removal of two hydrologic barriers which are causing and or risking significant hydraulic alteration of the wetland areas. The first barrier is an artificial concrete weir located on Pye Brook near Pye Brook Park in Topsfield. This weir will be completely removed. The second barrier is an undersized culvert located at Pond Street at the outlet of Hood Pond. This barrier will be replaced with a bridge that meets the Massachusetts Stream Crossing Standards and incorporates a nature-based hydrologic feature to ensure that the hydrology of the pond continues to support bordering wetlands as well as fish habitat. Removal of these barriers will restore pre-disturbance riverine and wetland hydrology, restore and sustain pre-disturbance wetlands communities and maintain natural hydrology over time.

(ii) How the ILF project will be established and operated.

This project is part of a larger comprehensive restoration project for the Howlett Brook system initially funded by a 2019 National Fish and Wildlife Foundation (NFWF) grant. This grant focused on restoring cold water and diadromous fisheries habitat to the system as an indicator of overall environmental health. The larger project is being managed by the Ipswich River Watershed Association in partnership with the Towns of Topsfield, Ipswich and Boxford, the Trout Unlimited Nor'East Chapter and the MA DFG's Division of Fish & Wildlife, and Division of Marine Fisheries. The proposed ILF project will be added to and incorporated into this larger project and will be operated within the existing management and operational structure of this partnership.

The Pye Brook and Hood Pond wetlands restoration project will be administered by the Ipswich River Watershed Association (IRWA) and jointly led by IRWA and Trout Unlimited, Nor'East Chapter. On behalf of and in partnership with the landowners, the project team will procure

funding, develop designs, obtain permits, manage subcontractors, oversee construction and conduct post-construction monitoring. The Town of Topsfield owns the land on which the barrier structures and a portion of the wetlands are located. The wetlands associated with the culvert replacement are owned by the MA Department of Conservation and Recreation.

(iii) The proposed ILF service area: **Coastal North**

(iv) The general need for and technical feasibility of the proposed ILF project.

Hood Pond Wetlands

Hood Pond is surrounded by an unusually diverse 44.7-acre complex of forested and open wetlands including the largest and one of the few remaining Atlantic White Cedar Swamps in Northeast Massachusetts. Although Hood Pond is a natural Great Pond, the current hydrologic regime is controlled by the Pond Street Causeway at its outlet stream. As one of the earliest roads built in Massachusetts, this causeway has controlled the hydrology of the pond and surrounding wetlands for nearly 400 years. This hydraulic regime was extensively studied as part of the effort to remove the barrier posed by the culvert in the causeway. The surrounding wetlands structure and composition were determined to be at risk if the barrier were designed to fully meet the Massachusetts Stream Crossing Standards because the mean annual hydrological regime would become more variable and seasonally drier. This would place the wetlands at risk of being drained entirely if the restored natural stream bed was to erode during a future flood event. As such, the design had to be modified to include a nature-based design component to ensure that the current hydrology of the wetlands that has existed for nearly 400 years be maintained while also meeting the stream crossing standards to the extent practicable.

The project team produced a stream crossing design that would both meet the Crossing Standards while mimicking the current hydrological regime of the Pond and the surrounding wetlands. The proposed design has been fully permitted, is about to go out to bid and set for construction in the fall of 2021 pending grant funding. A 5-year restoration site and wetlands monitoring plan will be implemented. Because this phase of the project has already been permitted and the project team has extensive expertise to implement such projects and conduct post-construction long-term monitoring, the project is feasible.

Pye Brook Park

The second component of the project is the restoration of the upgradient wetlands of the Pye Brook Park Road barrier. This 43.66-acre wetland complex previously consisted of a diverse mix of shrub and open marsh wetlands. Due to the installation of a U-shaped 20 X 10-foot concrete weir following the Mother's Day Storm of 2006, which was designed to protect downstream infrastructure and artificially meter downstream flow, the project had an unforeseen consequence of increasing upstream water levels, converting much of the upstream wetland to a cattail (*Typha* spp.) dominated wetland due to the major alteration in hydrology. As part of the larger Howlett Brook Project which evaluated the hydrology of the entire system, it was

determined that the structure could be removed without negatively impacting downstream infrastructure or natural resources.

With the hydrological assessment in hand, the Town of Topsfield, which is the owner of the weir, has expressed support of its removal. Because the weir was originally designed to be removable, construction feasibility is relatively straightforward and can be conducted entirely from the adjacent roadbed, thereby minimizing wetlands impacts. With hydrology of the site restored to pre-existing conditions, the upstream wetland community will be allowed to revert to its original diversity and structure naturally. Permits for this phase of the project are being finalized and permit applications will be submitted for a June 2021 public hearing of the Topsfield Conservation Commission. A 5-year post-construction monitoring plan will be established for the Pye Brook site. Because the project already has the support of the Topsfield Conservation Commission and the Town is an active Project partner, this phase of the project is feasible. This phase is also anticipated to be constructed in the fall of 2021 pending implementation funding.

(v) The proposed ownership arrangements and long-term management strategy for the in-lieu fee project site(s).

Hood Pond

This phase of the project will largely take place on the Pond Street Causeway, which is owned by the Town of Topsfield. Monitoring during and post-construction will be conducted by the Restoration Director for the Ipswich River Watershed Association and a Civil Engineer for Trout Unlimited. Post-construction operation of the new crossing structure will be conducted by the Topsfield Department of Public Works in consultation with the Project Team. Monitoring of the wetlands surrounding Hood Pond, which are entirely owned by the MA Department of Conservation and Recreation, will be coordinated by the Ipswich River Watershed Association and the Wetlands Ecologist at Trout Unlimited.

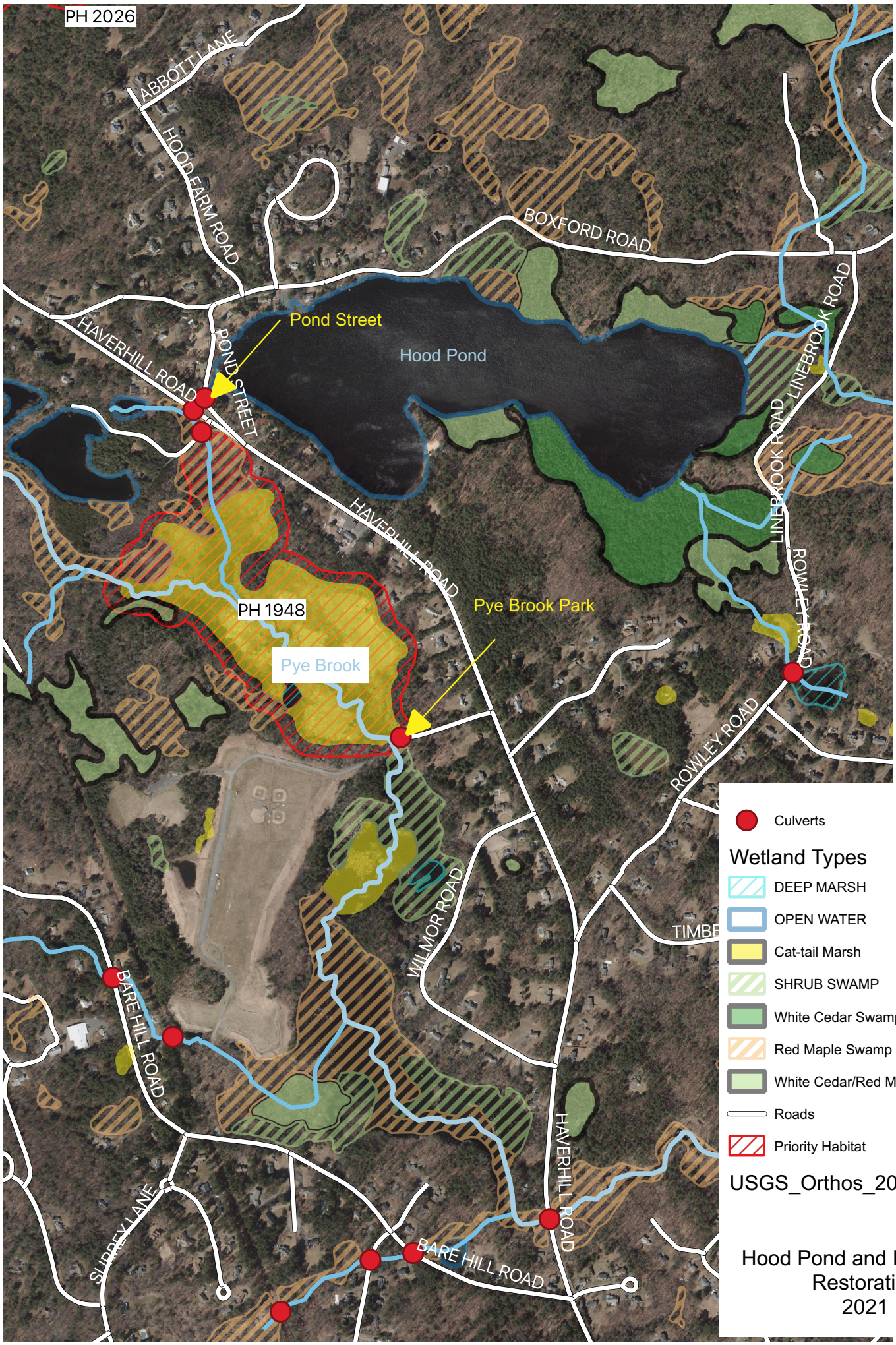
Pye Brook

The entirety of the Pye Brook project site and upstream wetlands complex is owned by the Town of Topsfield Conservation Commission, much of which is under a conservation restriction. The long-term management of the project and monitoring will be coordinated by the Ipswich River Watershed Association and long-term monitoring will be conducted by the Wetlands Ecologist at Trout Unlimited.

(vi) The qualifications of the Project Sponsor and any contractor/third-party to successfully complete the type of mitigation project proposed, including information describing any past such activities by the Project Sponsor and contractor/third-party.

The Project Sponsor, the Ipswich River Watershed Association (IRWA), has more than 40 years' experience planning and implementing restoration projects throughout the watershed. These include dam removals, culvert/bridge replacements, wetlands restoration, fisheries restoration,

flow restoration and general habitat restoration projects of up to $2.9M in scope. The IRWA established and directs the Parker-Ipswich-Essex Rivers Partnership (www.pie-rivers.org) which was the first and largest multi-watershed restoration coalition in Massachusetts which helped to facilitate more than 40 such projects since its inception. Both project site owners, the Town of Topsfield and the MA Department of Conservation and Recreation, as well as project partner Trout Unlimited Nor'East Chapter are active members of the PIE-Rivers Partnership and the Town of Topsfield serves on its Steering Committee. All partners in this project are active and seasoned practitioners of ecological restoration projects of various sizes and scope.


PH 2026
ABBOTT LANE
HOOD FARM ROAD
BOXFORD ROAD
HAVERHILL ROAD
POND STREET
Pond Street
Hood Pond
LINEBROOK ROAD
ROWLEY ROAD
PH 1948
Pye Brook
Pye Brook Park
WILMOR ROAD
BARE HILL ROAD
SURREY LANE
Culverts
Wetland Types
DEEP MARSH
OPEN WATER
Cat-tail Marsh
SHRUB SWAMP
White Cedar Swamp
Red Maple Swamp
White Cedar/Red Maple Swamp
Roads
Priority Habitat
USGS_Orthos_2019
Hood Pond and Pye Brook Restoration
2021

MA In-Lieu Fee Program, Draft Project Prospectus

Nantucket Eelgrass Restoration

ILF Program (ILFP) Sponsor: Massachusetts Department of Fish and Game (MA DFG)
Project Sponsor: Nantucket Land Council
Project Location: Nantucket Harbor, MA Coastal-South ILF Service Area

(i) The objectives of the proposed ILF project.

The Nantucket Land Council (NLC) and the Town of Nantucket Natural Resources Department are seeking funds to restore two ½-acre plots of eelgrass in Nantucket Harbor using seeding and vegetative planting techniques. The restoration of these beds will help to facilitate natural recovery of eelgrass within the system and provide a number of ecological and economic services. Nantucket Island supports more than 2,000 acres of eelgrass that serve as essential habitat to a number of different species including essential nursery habitat for the last commercially viable "wild" bay scallop fishery in the U.S.

(ii) How the ILF project will be established and operated.

The eelgrass beds will be established at two sites in Nantucket Harbor using a combination of seeding and hand-transplanting techniques.

NLC and the Town of Nantucket Natural Resources Department, with guidance from Boston University, will be responsible for permitting, planning, and conducting the restoration. NLC has existing permits for eelgrass restoration from the Town of Nantucket, the Massachusetts Department of Environmental Protection, and the Army Corps of Engineers. NLC is in the process of requesting that these existing permits be modified to include the proposed restoration and source bed sites and extended to cover the proposed project period. NLC anticipates harvesting reproductive material and transplanting between March and October over a three-year period from 2021-2023. The restoration will also engage community volunteers in seeding and transplanting activities.

(iii) The proposed ILF service area

The proposed eelgrass restoration is located in the Coastal-South Service Area (Nantucket Island).

(iv) The general need for and technical feasibility of the proposed ILF project.

Eelgrass declines in Nantucket over the last three decades have been mostly confined to Nantucket and Madaket Harbors, with Nantucket Harbor experiencing a 30% loss in areal coverage since 1995. Eelgrass declines in Nantucket Harbor have occurred along the deeper edges near Monomoy due to storm and tidal current action. Declines have also occurred along

both sides of the channel and in the upper reaches of the inner portions of the harbor. These losses are believed to be caused by water quality issues as the contributing watershed has experienced increased development.

The first restoration site (41˚ 17’9.06”, -70˚ 4’39.78”) is located near Monomoy and is adjacent to an area where NLC has been actively transplanting for the last three years. Eelgrass at this site disappeared during a shoaling event around 2012. Transplanting at this location has been successful, and NLC would like to further expand the area. The second restoration site (41°19'37.12", -70° 2'6.46") is located near Coatue. Eelgrass disappeared at this site a few years ago for unknown reasons. However, water quality conditions are still conducive for the establishment and growth of eelgrass, and there are a few beds nearby.

Restoration of eelgrass in Nantucket Harbor has been shown to be technically feasible, and NLC has been working on it successfully with the Town for the last few years with local support. The proposed project would use the funds provided by the ILF Program for supplies, equipment, boats, travel, and to hire experienced professionals to help facilitate the project.

(v) The proposed ownership arrangements and long-term management strategy for the in-lieu fee project site(s).

The proposed restoration sites are located within Nantucket Harbor; these waters are under local jurisdiction, managed by the Town of Nantucket. The NLC will monitor the proposed restoration sites for a period of 10 years. The NLC will also work with the Town of Nantucket and municipal Harbormaster to close these areas to boating and shell-fishing activities throughout the restoration process. Educational buoys and signage will be installed to indicate that these are restoration areas.

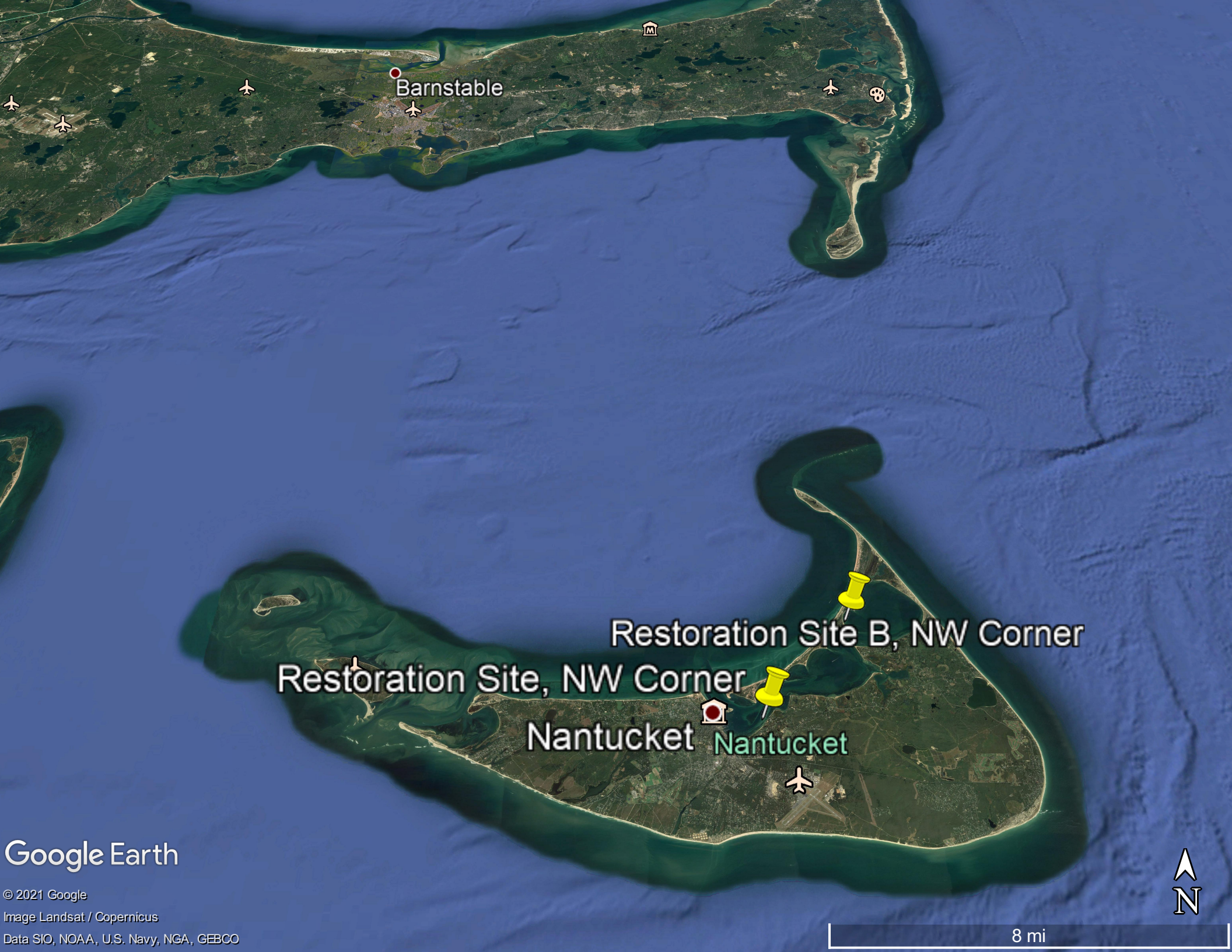
(vi) The qualifications of the Project Sponsor and any contractor/third-party to successfully complete the type of mitigation project proposed, including information describing any past such activities by the Project Sponsor and contractor/third-party.

The Nantucket Land Council was established in 1974 as a 501(c)(3) non-profit organization with a mission to preserve Nantucket’s natural resources, including its marine environment. The NLC worked with Dr. David Burdick of the University of New Hampshire Jackson Estuarine Laboratory on an eelgrass transplant project in 2011 using the transplanting eelgrass remotely with frames (TERF) approach at an alternative location in Nantucket Harbor. This effort was not successful due to insufficient light availability and a proliferation of macro-algae following restoration. The NLC staff has been working with Dr. Alyssa Novak since 2018 to implement an alternative restoration strategy.

Dr. Novak is trained in seagrass ecology and has led and assisted on multiple seagrass restoration and monitoring projects in New England and Canada. She developed a habitat suitability model for eelgrass in Plum Island and Great Bay Estuary and successfully restored 1 acre of eelgrass in Essex Bay between 2015 and 2018. She has been working with NLC since

2017 on eelgrass health assessments for Nantucket and Madaket Harbors and is currently guiding eelgrass restoration efforts in Nantucket Harbor.

The Town of Nantucket Natural Resources Department (NRD) has a strong focus on water quality and habitat management in its estuaries and harbors. The NRD staff includes a Shellfish Biologist, Assistant Biologist and Water Resource Specialist. In addition to monitoring water quality in Nantucket's ponds and harbors, the NRD also manages a state-of-the art shellfish hatchery, which contributes to the long-term sustainability of the local shellfishery and health of the island's marine resources. The NRD is currently also involved in oyster reef restoration and long-term eelgrass monitoring throughout the Harbor.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Restoration Site, NW Corner
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