

LONG ISLAND SOUND STUDY
BISTATE HABITAT RESTORATION INITIATIVE

GUIDELINES FOR IMPROVING
HABITAT RESTORATION GRANT APPLICATIONS

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TABLE OF CONTENTS

Chapter 1 – Introduction and Other Background Information.....	3
Introduction.....	4
Habitat Restoration Priorities.....	4
Elements of a Complete Habitat Restoration Proposal (an overview).....	5
Important Information Regarding Project Design Plans.....	6
Global Climate Change Issues.....	6
Habitat-Specific Project Guidance.....	6
Activities Not Recommended for Funding.....	9
Literature Cited.....	9
Habitat Restoration Manual (link).....	9
Chapter 2 – Permit Requirements for Coastal Habitat Restoration.....	10
Permits for Projects in New York State.....	11
Permits for Projects in Connecticut.....	12
Chapter 3 – Elements of a Complete Habitat Restoration Proposal.....	15

CHAPTER ONE

Introduction and Other Background Information

INTRODUCTION

There are numerous grant programs that provide funds for Long Island Sound (LIS) habitat restoration projects, such as Connecticut's LIS Fund (License Plate Program), NOAA's Community-based Habitat Restoration Program, and the National Fish & Wildlife Foundation's LIS Futures Fund. Each grant program has its own specific guidelines regarding eligible activities and application processes. However, members of the Long Island Sound Study (LISS) Habitat Restoration Initiative (HRI) work group, who regularly serve as technical reviewers for grant programs, have found that applicants often do not include sufficient technical details to allow for a thorough project review. In these cases, applications may be rated poorly by reviewers or rejected due to uncertainties regarding the plans submitted – or not submitted for that matter.

The purpose of this document is to provide guidance to potential habitat restoration grant applicants, and it should be viewed as a supplement to any grant program's Request for Proposals. This document includes information on habitat restoration priorities, details on developing the necessary habitat restoration plans, habitat-specific project guidance, information on projects discouraged by the HRI, and a summary of potentially-applicable state permits. Questions about the HRI or any topics included in this document should be directed to one of the following LISS Habitat Restoration Coordinators:

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CT Habitat Restoration Coordinator
CT Dept of Environmental Protection
harry.yamalis@po.state.ct.us
860-424-3620

Heather Young
NY Habitat Restoration Coordinator
NY State Dept of Environmental Conservation
hxyoung@gw.dec.state.ny.us
631-444-0441

Questions about grant programs should be addressed to the specific grant administrators. For information on LIS grant programs, please visit www.longislandsoundstudy.net/grants.

HABITAT RESTORATION PRIORITIES

Habitat restoration, as defined by the LISS HRI, is the intentional alteration of a site to attempt to reestablish the approximate biogeophysical conditions that existed in the predisturbance ecosystem or habitat. A habitat restoration project should aim to reestablish the same functions and values as those which are characteristic of an undisturbed habitat of the same type. The HRI has identified the following 12 priority coastal habitat types:

Cliffs and Bluffs
Coastal Barriers, Beaches, & Dunes
Coastal Grasslands
Coastal and Island Forests
Estuarine Embayments
Freshwater Wetlands

Intertidal Flats
Riverine Migratory Corridors
Rocky Intertidal Zones
Molluscan (shellfish) Reefs
Submerged Aquatic Vegetation
Tidal Wetlands

The HRI recommends that restoration projects focus on at least one of these priority coastal habitat types. With the exception of diadromous fish passage projects, to be eligible for most Long Island Sound funding opportunities, all projects must be within the LISS project boundary (Figure 1). If you have questions regarding whether your project is within the boundary, please contact your habitat restoration coordinator.

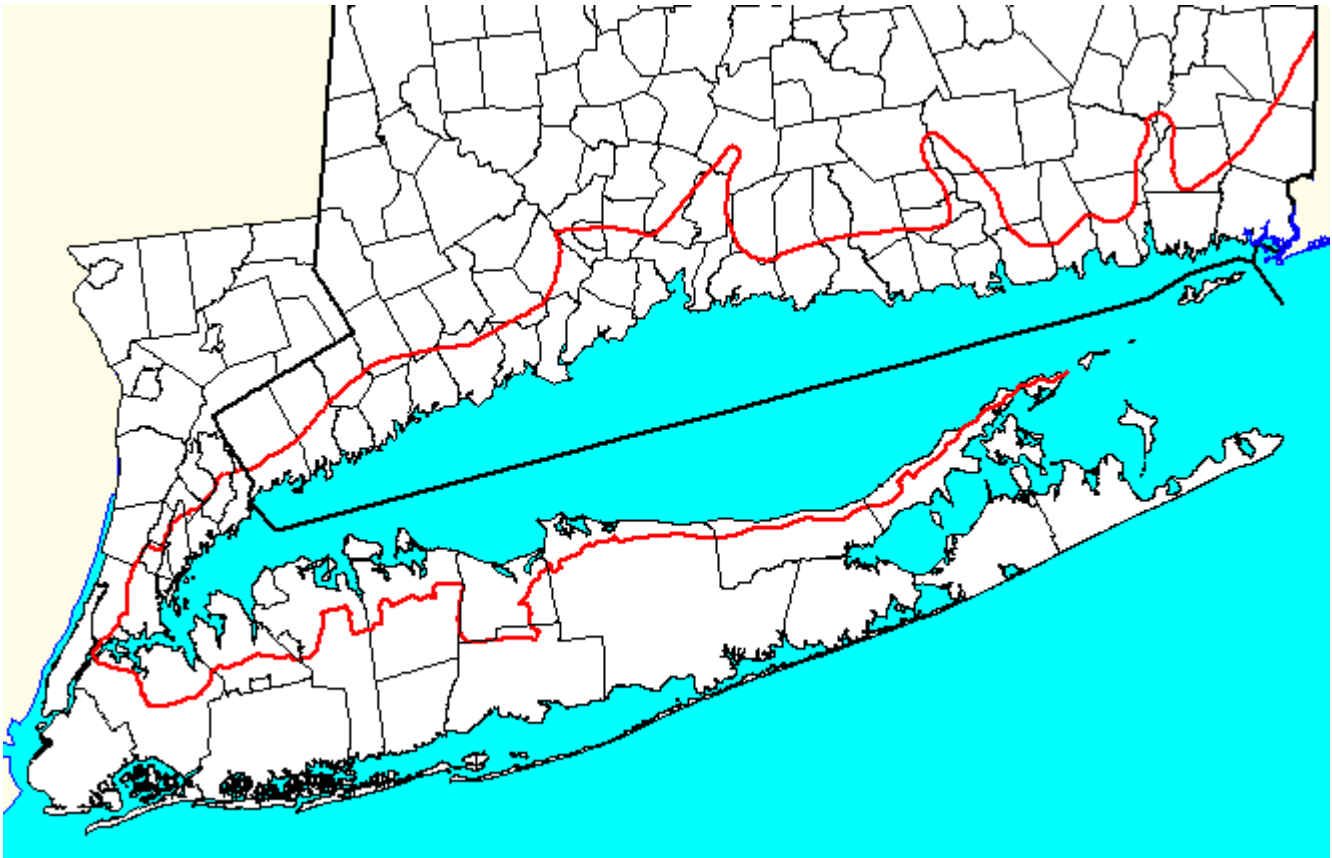


Figure 1. The Long Island Sound Study Project boundary (red line) is based on climatological and topographical features, and political jurisdictions. In Connecticut, the boundary is the coastal hardwoods zone ecoregion described in Dowhan and Craig (1976). The northern extent of this ecoregion represents the inland extent of coastally-influenced vegetation. In New York, the project boundary follows the Harbor Hill moraine through Queens, Nassau, and Suffolk Counties. The western extent of the project boundary is the Triborough Bridge span that crosses the East River from Queens to the Bronx. The project boundary in Bronx and Westchester Counties is drawn to follow a portion of the Bronx River and the Hutchinson River Parkway.

Restoration projects will be successful only if the cause of degradation can be managed. Applicants must demonstrate in their proposals that sources of degradation can be adequately controlled. If planting is necessary to achieve restoration goals, the HRI strongly recommends that only plants grown from stock native to the Long Island Sound area be used. All projects should include a 3-year (minimum) post-construction maintenance and monitoring plan.

ELEMENTS OF A COMPLETE HABITAT RESTORATION PROPOSAL

Please refer to the document entitled Elements of a Complete Habitat Restoration Proposal (Chapter 3 of this document) and respond to each item as completely as possible. Submission of this plan is one of the required components of the many available funding programs to which you may be applying for restoration funds. Even if this plan is not a requirement of the funding program, supplying the project information requested in it will enhance the breadth of your proposal and possibly improve your score during the review and ranking process.

IMPORTANT INFORMATION REGARDING PROJECT DESIGN PLANS

a) If the application is for design funds, please include evidence that the project is feasible. Acceptable items (where applicable) include elevation surveys, vegetation surveys, preliminary or conceptual design plans, tide studies, and stream surveys. Please include copies of the survey results / reports and/or contact information for each consultant that conducted these surveys. Applications for restoration design funds which do not include the necessary background information about the project site cannot be adequately reviewed. Upon project completion, final project design plans will be among the required deliverables for design-funds grant awards. Design plans must meet the specifications outlined above, as well as the requirements of the all regulatory agencies that have jurisdiction.

b) If the application requests funds for construction, please include a copy of the final, scaled project design plans, as well as a list of those who have reviewed and approved them. Final design plans submitted with construction proposals must meet the specifications outlined in part **(a)**, above, as well as the requirements of the all regulatory agencies that have jurisdiction.

GLOBAL CLIMATE CHANGE ISSUES

A complete application will address issues related to global climate change where applicable, including accelerated sea level rise. These issues are important to the success of a habitat restoration project, especially those that involve species already living at the southern extent of their natural range. Increasing temperature can also increase the rate of growth and reproduction for many species of invasive plants. Sea level rise will drive tidal marshes and other coastal habitats landward, but only where the landscape will allow them to. In some cases the slope will be too steep to allow a tidal marsh to migrate landward; in other cases, there may be a man-made wall blocking the marsh transgression process on an otherwise very flat or gently sloped parcel immediately landward of the proposed restoration site. All of these can impact the long-term sustainability of the habitat proposed to be restored, and will influence the decision of the proposal reviewers. An example of an ideal site for tidal marsh restoration is a site that borders a very gently sloped, and undeveloped upland to allow the natural migration of the marsh as the rising sea level begins to flood the upland.

HABITAT - SPECIFIC PROJECT GUIDANCE

This section provides habitat-specific project guidance for some of the HRI's priority coastal habitats. The following sections, which are not all-inclusive, provide examples of restoration projects and information on additional factors that should be addressed in a restoration grant proposal.

Coastal Barriers: The most common restoration project on a coastal barrier is the restoration of dunes that have been altered or trampled by people. Ideally, planting is conducted by thinning and transplanting American beachgrass (*Ammophila breviligulata*) from the protected backslopes of dunes, which ensures that genetic stock native to LIS is used. Applicants must demonstrate that sources of degradation, such as uncontrolled pedestrian access, can be adequately managed. This can be accomplished through the use of sand fences and/or the construction of an elevated boardwalk over the dune. Additional information on coastal barrier restoration is provided in the HRI's Technical Support for Coastal Habitat Restoration manual, which is available online at: http://www.longislandsoundstudy.org/pubs/reports/habitat_rest_03/hri03_barriers.pdf.

Coastal Grasslands: The most prevalent causes of degradation in grassland communities are development and fire suppression. Fire suppression allows low diversity shrub cover to invade, making the area unsuitable for grassland specialized species. Grassland restoration projects often involve mowing, cutting, or controlled burning (where feasible) and may include planting of warm season grasses, such as little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), and broomsedge (*Andropogon virginicus*). Consultation with plant ecologists and review of technical reports on vegetation can be used to identify the

appropriate plant community for restoration of a coastal grassland, or to help reconstruct the historic vegetation types. The most important component of grassland restoration projects is long-term management, so applicants must detail their plan for continuing management activities after the grant funds are expended. Additional information is provided in the HRI's Technical Support for Coastal Habitat Restoration manual, which is available at: http://www.longislandsoundstudy.net/pubs/reports/habitat_rest_03/hri03_grassl.pdf.

Coastal and Island Forests: The most prevalent problem in coastal and island forests is the presence of invasive species. Invaders of coastal forests include tree of heaven (*Ailanthus altissima*), black locust (*Robinia pseudoacacia*), and Asiatic bittersweet (*Celastrus orbiculatus*). On many coastal islands, the original forests were modified and non-native trees and shrubs were planted. Consultation with plant ecologists and review of technical reports on vegetation can be used to identify the appropriate plant community for restoration of a coastal forest, or to help reconstruct the historic vegetation types. In some cases, there may need to be field surveys of similar soils in order for ecologists to develop their best recommendations for what the historic vegetation community consisted of (e.g., there is actually little published data about the vegetation of coastal islands). Applications for the removal of non-native vegetation should detail how the vegetation will be removed, what will be done with the harvested vegetation, and if and how herbicides will be used, including the dosages to be applied and information on the efficacy of the herbicide for each target species. A forest restoration proposal should also include an evaluation of how deer may have impacted the forest and how they will impact any plantings that might be proposed.

Freshwater Wetlands: The major cause of wetland degradation is the alteration of the wetland system's hydrology. This alteration may result from draining, filling, or impounding. Filling of wetlands increases their elevation and causes the plant community to disappear due to burial. If this is the case, restoration may be accomplished through fill removal. Once the correct elevations are restored, the hydrology should reach equilibrium and the existing seed bank should re-vegetate the wetland naturally. The HRI work group recommends that the restoration of buffer areas and corridors between freshwater wetlands and complementary upland habitats be included as part of any freshwater wetland restoration. Projects must be engineered so that they do not cause flooding or other damage to adjacent properties, infrastructure, or other habitat types. Sample projects include adjusting the hydrology to a pre-disturbance condition and planting native wetland vegetation. Additional information is provided in the HRI's Technical Support for Coastal Habitat Restoration manual, which is available online at: http://www.longislandsoundstudy.net/pubs/reports/habitat_rest_03/hri03_fw.pdf.

Molluscan Reefs: Consistent with the classification used for the National Wetland Inventory, the HRI uses the term "molluscan reef" to describe the habitat that is created by several molluscan species – typically American oysters and blue mussels in Long Island Sound. Projects to restore molluscan reefs focus on creating habitat for all species, not for aquaculture-related purposes. Applicants must clearly demonstrate that the site selected for a reef restoration project was once home to natural beds or reefs, not populations of oysters or mussels that were seeded or otherwise introduced at the site for harvest. Applicants need to evaluate the nature of the affected bottom communities and describe existing functions to demonstrate that the proposed restoration would not have unacceptable impacts upon the environment. Critical to the success of a mollusc reef restoration proposal is the demonstration that measures will be taken to prevent future harvest of the mussels or oysters from the restored areas. Funding will not be provided for the restoration of these species so that they simply can be harvested for commercial gain.

Riverine Migratory Corridors: Projects to restore riverine migratory corridors often involve removing or modifying dams (i.e., adding a fish ladder) or other man-made obstructions in rivers to allow the passage of diadromous fish species. Applicants must demonstrate that the waterway once provided passage to spawning habitat upstream of the barrier for at least one species of diadromous fish. Diadromous fish in LIS include alewife, American eel, American shad, Atlantic salmon, blueback herring, gizzard shad, hickory shad, rainbow smelt, sea lamprey, sea-run brown trout, and white perch. The presence of any of these species at the base of a dam during the spring migration is evidence enough of an historic fish run. If fish are not currently present, the

applicant should perform an historical survey, prior to submitting the application for funding, to determine whether or not an historical fish run existed at the site.

Submerged Aquatic Vegetation (SAV): The dominant SAV in LIS is eelgrass (*Zostera marina*), the abundance and distribution of which has decreased as a result of nitrogen enrichment. Given the current decline of eelgrass in the Sound's bays and harbors, the HRI work group recommends that projects focus on small-scale test plots and monitoring activities rather than on large-scale plantings. Applicants must demonstrate that SAV beds exist or had once existed at the site to be restored. Additional information, including water quality guidelines for eelgrass, is provided in the HRI's Technical Support for Coastal Habitat Restoration manual, which is available at: http://www.longislandsoundstudy.net/pubs/reports/habitat_rest_03/hri03_sav.pdf.

Tidal Wetlands: As with freshwater wetlands, the major cause of tidal wetland degradation is the alteration of the wetland system's hydrology. Hydrological changes to tidal marshes have been caused by grid ditching, filling, draining, and impounding. Grid ditching has affected more acreage of tidal marshes than any other type of degradation; however, the HRI work group is studying the effects of ditch-plugging and currently recommends allowing the ditches to fill naturally. As with freshwater wetlands, filled tidal wetlands may be restored by excavating the fill materials. Depending on the scope of the project and the location of the fill, a fill removal project may require the use of low-ground pressure equipment that is designed to operate on the organic and compressible soils of tidal wetlands.

Marsh draining occurs when tidal flow into a marsh is restricted by undersized culverts or tide gates, the two most common types of structures. Reintroduction of tidal flow is the principal technique used to restore salt marshes degraded by tide gates and undersized culverts. Planting is not recommended for this type of restoration, as the natural stock of wetland vegetation will reestablish itself (this method also helps to minimize costs). Projects must be engineered so that they do not cause flooding or other damage to adjacent properties, infrastructure, or other habitat types. Where tidegates (or other adjustable flood-control devices) are involved, the proposal should state who has jurisdiction over the position of the gate. Large-scale projects may require the deployment of tide gages and modeling, while for less-complex projects, tidal obstruction can be demonstrated by simple tidal observations. At minimum, the following information should be included in a typical proposal:

- elevation of high tide line, mean high water, and low tide line, downstream and upstream of any existing tidal restrictions or other structures (tide gates, culverts, dikes, etc);
- additional tide data – a tide study analysis should be included with the application, which would present such findings as, when the high tide peaks then starts to recede, is water still flowing upstream through a culvert or tide gate opening? Is the peak high tide on both sides of a tidal restriction at the same elevation?;
- marsh elevations, including a combination of transects and spot elevations at areas that are clearly higher or lower than the surrounding marsh. These should be recorded both downstream and upstream of any tidal restrictions;
- baseline vegetation map (high marsh, low marsh, Phragmites density, etc.);
- soil and water salinity (downstream and upstream of any existing tidal restrictions) during spring high tide and, ideally, during the May to July growing season); and,
- elevations of the lowest lying adjacent properties, such as homes, businesses, infrastructure, etc.

It was stated earlier that an ideal site for tidal marsh restoration is a site that borders a very gently sloped, and undeveloped upland to allow the natural migration of the marsh as tidal flooding becomes more frequent. This should not be viewed as contradictory to the requirement of protecting adjacent properties from flooding as a result of habitat restoration. These low-lying uplands will inevitably become subject to tidal inundation as a result of sea level rise, but their flooding should not be a direct consequence of the habitat restoration project.

Additional information on LIS tidal wetland restoration is provided in the HRI's Technical Support for Coastal Habitat Restoration manual, available at: http://www.longislandsoundstudy.net/pubs/reports/habitat_rest_03/hri03_tw.pdf.

ACTIVITIES NOT RECOMMENDED FOR FUNDING

There are four main categories of projects that are not recommended by the HRI work group for habitat restoration funding: habitat creation; modification of healthy habitat; alteration of natural processes; and Phragmites control.

1. Habitat Creation – Habitat creation is defined by the HRI as bringing into existence a habitat that was not historically supported at the site in question. Creation requires the destruction or conversion of the existing habitat in favor of a new habitat, which the HRI does not promote. For example, wetlands should not be filled to create a coastal grassland, and freshwater wetlands should not be connected to the tides simply to convert them to tidal wetlands.

2. Modification of Healthy Habitat – The HRI does not recommend restoration funding for projects to modify healthy habitats. An example of this type of project is the creation of tidal ponds or creeks in an otherwise healthy marsh. While creating creeks and ponds can enhance species diversity by increasing fish abundance and attracting birds, creation of these aquatic features comes at the expense of productive tidal marsh habitat. Another example is a project to convert a healthy freshwater wetland to its historical condition as a tidal wetland.

3. Alteration of Natural Processes – Ecological restoration focuses on restoring habitats degraded by man. If natural processes are causing the degradation or destruction of the habitat, the HRI work group does not recommend that attempts be made to restore the habitat. For example, coastal barrier beaches may ‘migrate’ landward during storms when sand overwashes a dune and buries the tidal wetland behind the dune. This migration and the resultant tidal wetland burial are natural. Proposals to restore the buried tidal wetland may not be reviewed favorably and are unlikely to receive the necessary permits. Projects to restore habitat (terrestrial or aquatic) lost by natural channel migration and erosion also are not recommended by the HRI work group.

4. Phragmites Control – Proposals to remove dense stands of Phragmites, either by mechanical or chemical means, are not recommended for habitat restoration funding by the HRI. Mowing or chemically treating Phragmites provides only a temporary solution; preventing recolonization requires long-term maintenance and continued control. Given the high level of maintenance required and the unlikelihood of complete, long-term eradication, projects to remove dense Phragmites stands are not recommended for habitat restoration funding.

Literature Cited

Dowhan, J.J. and R.J. Craig. 1976. Rare and endangered species of Connecticut and their habitats. State Geol. Natur. Hist. Surv., CT Dept. Environmental Protection, Rep. Invest. No. 6, 137pp.

Habitat Restoration Manual

The LISS has prepared a document to assist with the planning and implementation of habitat restoration projects. This document is a free download from <http://www.longislandsoundstudy.net/habitat/index.htm>.

CHAPTER TWO

Permit Requirements for Coastal Habitat Restoration

Table 1: List of potentially applicable permits for habitat restoration activities in Connecticut and New York. Please contact the appropriate regulatory agency to help you determine which permit application(s) you may need for your project and approximately how long the agency will need to process your application.

Potentially Applicable Permits in New York			
Issuing Agency	Permit Type	Process Time*	Contact Info
DEC- Division of Fish, Wildlife and Marine Resources	Tidal Wetlands	** see below	http://www.dec.state.ny.us/website/dcs/index.html
DEC- Division of Fish, Wildlife and Marine Resources	Freshwater Wetlands	** see below	http://www.dec.state.ny.us/website/dcs/index.html
DEC- Division of Fish, Wildlife and Marine Resources	Wild, Scenic, and Recreational Rivers		For Nissequogue River only http://www.dec.state.ny.us/website/dcs/index.html
DEC- Division of Fish, Wildlife and Marine Resources	Water Quality Certification	** see below	http://www.dec.state.ny.us/website/dcs/index.html
DEC- Division of Fish, Wildlife and Marine Resources	Protection of Waters	** see below	http://www.dec.state.ny.us/website/dcs/index.html
DEC- Division of Water	Dam Safety		http://www.dec.state.ny.us/website/dcs/index.html
DEC- Division of Water	Coastal Erosion Hazard Areas		http://www.dec.state.ny.us/website/dcs/index.html
Army Corp of Engineers- New York Region	Regulatory Branch, New York District		(212) 264-6731 http://www.nan.usace.army.mil/business/buslinks/regulat/index.htm

Check with your local municipality to see if a permit is required for your project.

*An estimate of how long the regulatory agency will need to process your permit application from the day they receive it.

**Times are from time application is complete; 45 days for minor projects and 90 days for major projects

NYS DEC Department of Environmental Permits Phone Numbers		
Region 1	(631) 444-0365	Nassau and Suffolk Counties
Region 2	(718) 482-4997	Boroughs of Bronx and Queens
Region 3	(845) 256-3054	Westchester County

PERMITTING REQUIREMENTS FOR HABITAT RESTORATION PROJECTS IN CONNECTICUT

Many habitat restoration projects will need state or local authorization of some kind. Projects in tidal wetlands may also need federal authorization from the Army Corps of Engineers. In general, projects whose activities are entirely above the High Tide Line (HTL) as defined in the Connecticut General Statutes will not need authorization from the CT DEP's Office of Long Island Sound Programs (OLISP), while any project that may impact areas below the HTL will need written authorization from OLISP. Below is a checklist of authorizations that may potentially be required for projects in Connecticut, followed by a detailed description of the permitting requirements for habitat restoration projects done within the State of Connecticut. Requirements are listed by habitat type. **In all cases, if the grant applicant is not the owner of the property where proposed habitat restoration project is located, a letter from the property owner expressing written support for the project will be required for both the grant application and any necessary permit applications.**

Table 2. List of permits that may be required for some habitat restoration projects. Please review the list and circle Y or N, depending on whether or not that specific permit type will be necessary for your project. The Connecticut Habitat Restoration Coordinator can help you determine which, if any, permits will be required. In some cases, a pre-application meeting with a permit analyst will be necessary to make this determination. Most habitat restoration projects will not require more than 2 or 3 of these permit types.

Permit Required?	Issuing Agency	Permit Type	Process Time	Contact Info
Y N	Are you the property owner of the project site?		N/A	N/A
Y N	Do you have property owner permission?		N/A	N/A
Y N	DEP - Office of Long Island Sound Programs	Certificate of Permission (COP)	up to 3 months	860-424-3034; http://www.ct.gov/dep/cwp/view.asp?a=2709&q=324222&depNav_GID=1643
Y N	DEP - Office of Long Island Sound Programs	Structures, Dredging, Fill, & Tidal Wetlands Permit	1 year	860-424-3034; http://www.ct.gov/dep/cwp/view.asp?a=2709&q=324222&depNav_GID=1643
Y N	DEP - Office of Long Island Sound Programs	Water Quality Certificate		860-424-3034; http://www.ct.gov/dep/cwp/view.asp?a=2709&q=324222&depNav_GID=1643
Y N	DEP - Inland Water Resources Division	Flood Management Certificate		860-424-3019; http://www.ct.gov/dep/cwp/view.asp?a=2709&q=324222&depNav_GID=1643
Y N	DEP - Inland Water Resources Division	Dam Safety Permit		860-424-3019; http://www.ct.gov/dep/cwp/view.asp?a=2709&q=324222&depNav_GID=1643
Y N	DEP - Inland Water Resources Division	Water Diversion Permit		860-424-3019; http://www.ct.gov/dep/cwp/view.asp?a=2709&q=324222&depNav_GID=1643
Y N	DEP - Inland Water Resources Division	Stream Channel Encroachment Line Permit		860-424-3019; http://www.ct.gov/dep/cwp/view.asp?a=2709&q=324222&depNav_GID=1643
Y N	DEP - Inland Water Resources Division	Water Quality Certificate		860-424-3019; http://www.ct.gov/dep/cwp/view.asp?a=2709&q=324222&depNav_GID=1643
Y N	DEP - Inland Water Resources Division	State Inland Wetlands Permit (only when a state agency is the applicant)		860-424-3019; http://www.ct.gov/dep/cwp/view.asp?a=2709&q=324222&depNav_GID=1643
Y N	US Army Corps of Engineers- Programmatic General Permit	Regulatory Branch, New England District		http://www.nae.usace.army.mil/reg/
Y N	Municipal agencies (ie, Inland Wetlands or Conservation Commission)	call for information	call for info	varies by town

* Permission from property owners, when applicable, must be submitted signed and in writing with your grant application.

Requirements for plans submitted with CTDEP – OLISP permit applications

The requirements for project plans for CTDEP coastal permits are many. Project design plans require a high level of detail and usually must be completed by certified engineers. Plans that may meet the requirements for a grant application may not be suitable for the permit application that will be necessary for a habitat restoration project located below the high tide line. For example, a CTDEP permit application for tidal wetland restoration will require scaled plan-views and elevation-views. A vicinity map and photographs of the site are also necessary. As permitting requirements change from time to time, specific plan requirements are not listed here. Please contact the CT Habitat Restoration Coordinator for questions regarding OLISP coastal permits, and to schedule a pre-application meeting with the permit review staff if necessary. It makes more sense for applicants to draft only one set of plans for the entire project, as opposed to two or more with varying levels of detail.

Cliffs and Bluffs – Restoration of cliffs and bluffs will not need authorization from OLISP unless some of the work that is done falls below, or impacts areas below the high tide line. To find out if a potential project falls within OLISP jurisdiction, please contact the CT Habitat Restoration Coordinator to discuss project details. Applicants must have permission from the property owner, and should check with municipal governments to see if the proposed activities might need local permits. For example, local Planning & Zoning or Building Departments may need to approve the plans for any proposed structures, and a local Conservation Commission may want to review the proposed restoration.

Coastal Barriers – In most cases, the restoration of coastal barriers involves a combination of invasive weed removal, transplanting of American beachgrass (*Ammophila breviligulata*), building structures to keep pedestrian & vehicular traffic off the dunes, and the relocation of small boats (ie, dinghies) being stored on the dunes and other vegetated areas. Structures would include elevated wooded walkways or boardwalks to convey pedestrians over a dune, or the installation of sand fence to keep people out of certain areas. All of these activities would take place above the High Tide Line and are exempt from OLISP jurisdiction. Applicants must have permission from the property owner, and should check with municipal governments to see if these activities might need local permits. For example, local Planning & Zoning or Building Departments may regulate the construction of boardwalks and fences, and a local Conservation Commission may want to review the proposed restoration. OLISP will, however, take jurisdiction over projects where sand or gravel modification is proposed - beach nourishment, regrading of existing or imported sand, removal of rocks, boulders, etc, are all examples of activities under OLISP jurisdiction. It is recommended that grant applicants call the CT Habitat Restoration Coordinator to discuss project details prior to submitting a permit application.

Coastal Grasslands – Coastal grassland restoration activities are done well above the high tide line and well outside of OLISP jurisdiction. As with any habitat restoration project, property owner permission is required. The installation of any structures, such as fences to keep pedestrians and potential predators away from the project site, may fall under the jurisdiction of local building codes. The local Conservation Commission may want to review the proposed restoration.

Coastal and Island Forests – Coastal and island forest restoration activities are also done well above the high tide line and well outside of OLISP jurisdiction. As with any habitat restoration project, property owner permission is required. The installation of any structures, such as fences to keep pedestrians and potential predators away from the project site, may fall under the jurisdiction of local building codes. The local Conservation Commission may want to review the proposed restoration.

Estuarine Embayments – The restoration of estuarine embayments will need authorization from OLISP in all cases where structures, dredging, fill, or changes to the flow of tidal waters are involved. Please contact the CT Habitat Restoration Coordinator to discuss project details.

Freshwater Wetlands – These include only non-tidal inland wetlands; tidally-influenced freshwater wetlands are covered in the Tidal Wetlands section below. All inland wetlands are out of OLISP jurisdiction, but are subject to regulation by municipal Inland Wetlands Commissions, in addition to local building codes if

structures are involved. There are potentially several authorizations necessary from CTDEP's Inland Water Resources Division (IWRD) for projects in inland wetlands. Please see Table 1 (above) and contact the CT Habitat Restoration Coordinator to determine if any of these permits are necessary for your project. Property owner permission will be necessary if the applicant does not own the subject property. A local Inland Wetlands and/or Conservation Commission may have regulatory jurisdiction and may want to review the proposed restoration.

Intertidal Flats – The restoration of intertidal flats will need authorization from OLISP in all cases where structures, dredging, fill, or changes to the flow of tidal waters are involved. Please contact the CT Habitat Restoration Coordinator to discuss project details.

Molluscan (shellfish) Reefs – Restoration of molluscan beds or reefs may require authorization from the CT Dept. of Agriculture, Bureau of Aquaculture. Grant applicants are advised to call the Aquaculture Laboratory in Milford at 203-874-0696 before submitting their applications for funding. Depending on what, if any, structures will be necessary for the restoration project, OLISP authorization may also be required. Grant applicants are urged to contact the CT Habitat Restoration Coordinator regarding all molluscan reef habitat restoration projects. A review will be performed to determine whether the location of the restoration project may interfere with other coastal activities. The local shellfish commission should also be contacted.

Riverine Migratory Corridors – Permitting for the removal or modification of a dam to accommodate fish passage structures can get quite complicated. Grant applicants for fish passage projects are strongly encouraged to contact CTDEP's Inland Water Resources Division (IWRD - see Table 1) for project feasibility before submitting any grant applications. If the dam (or other structure) that is hindering the passage of fish happens to be in tidal waters (for example, the first dam on a tidal creek or river; tidegate; or culvert in the tidal area) applicants are also urged to contact the CT Habitat Restoration Coordinator to determine if a coastal permit might also be necessary. Once again, property owner permission will be necessary if the applicant does not own the dam, or the property and other structures at the project site. A local Inland Wetlands and/or Conservation Commission may have regulatory jurisdiction and may want to review the proposed restoration.

Rocky Intertidal Zones – The restoration of rocky intertidal habitat will need authorization from OLISP in all cases where structures, dredging, fill, or changes to the flow of tidal waters are involved. This includes the addition, removal, or rearrangement of rocks, boulders, etc. Please contact the CT Habitat Restoration Coordinator to discuss project details.

Submerged Aquatic Vegetation – Due to water quality limitations, restoration of eelgrass beds on a large scale are discouraged in favor of multiple smaller scale test plots. Even these test plots, however, fall under OLISP jurisdiction and may need written authorization before in-water work can begin, especially if any permanent or temporary structures are involved with the project. Grant applicants are urged to contact the CT Habitat Restoration Coordinator regarding all submerged aquatic vegetation habitat restoration projects. A review will be performed to determine whether the location of the restoration project may interfere with other coastal activities. The local shellfish commission should also be contacted.

Tidal Wetlands – In all instances, the restoration of tidal wetlands will require OLISP authorization and grant applicants are urged to contact the CT Habitat Restoration Coordinator regarding all tidal wetland restoration projects. No matter their size, individual tidal marsh systems may have multiple property owners. Each owner's parcel of a tidal marsh proposed for restoration will likely be impacted to some degree. For this reason, advanced written permission from all property owners (and in some cases, adjacent property owners) is required and must be submitted with your grant proposal as well as with your permit application.

CHAPTER THREE

Elements of a Complete Habitat Restoration Proposal

Am I ready to apply for habitat restoration funding?

To determine if you are ready to apply for on the ground habitat restoration funding, you should be able to fully respond to the items in the recently developed ‘Elements of a Complete Habitat Restoration Proposal’ list which follows. Including these elements in your grant application will make for a more comprehensive proposal. The following information was adapted from the Society for Ecological Restoration International’s Guidelines for Developing and Managing Ecological Restoration Projects, available online at: http://www.ser.org/pdf/SER_International_Guidelines.pdf.

Elements of a Complete Habitat Restoration Proposal:

- 1. Identify the project site location and its boundaries.** Project boundaries must be clearly delineated on a map or aerial photograph, as they would be presented in a site plan or a vicinity map. A USGS quadrangle or topographic map centered over the project site at a scale of 1:24,000 generally makes for a good site plan. Be sure to highlight the project site or project boundary, as well as its relationship to other features such as the shoreline or park boundary, if applicable. Applicants must also provide photographs of the site in its current and historic (if possible) conditions. Both current, on-the-ground photos as well as recent aerial photographs (if available) should be included. Restoration boundaries can also be transferred onto a base map from GPS points acquired in the field.
- 2. Estimate extent of area to be restored.** This information should be presented in acres (or square feet for small-scale projects), or in linear miles for fish passage projects. Briefly describe how this estimate was determined (e.g., using aerial photos, GIS, on-site measurements, etc).
- 3. Identify ownership and permission granted.** Applicants must demonstrate ownership or other legal interest in the affected property (i.e., copies of applicable property deeds or conservation easements), or a written demonstration of permission and support from the property owner, if the applicant is not the property owner. If there are multiple property owners, a letter of support for the project signed by each property owner must be submitted with the application. Also, describe how the restoration site will be protected from future development or other potential modifications (e.g., easements, ownership).
- 4. Identify uses of the proposed restoration area and the impacts of the proposal upon those uses.** There may be various uses of the habitat either under the direct control of the owners, or the habitat may be leased for various purposes such as but not limited to salt hay farming, cultivation, or forestry. Please describe how the habitat is currently used and identify any changes that would result from restoration.
- 5. Demonstrate that the habitat to be restored exists or existed at the site historically.** This information may come in the form of historic maps or photographs, charts, aerial photographs, articles, surveys, technical reports, or other documents that verify the existence of the habitat type at that location. Historic charts and aerial photographs can be used to demonstrate that a healthy habitat (tidal wetlands, for example) had once existed at a location and were subsequently altered by human impacts. Soil surveys (available on the Natural Resources Conservation Service’s website: websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx) can demonstrate that tidal wetland soils exist or have been converted to another habitat type (e.g., mapped as fill or udorthents). Soil series are also instructive about the soil moisture regime, nutrient status, and drainage which can help to identify the potential historic vegetation type.
- 6. Demonstrate that the site is currently degraded, and describe the anthropogenic cause(s) and nature of the degradation.** Proof that a habitat truly is degraded is key in a habitat restoration grant proposal. Habitat restoration is about restoring habitats degraded by anthropogenic activities. Habitats degraded by nature are usually an indication that the site can no longer sustain the historic habitat, and that the habitat is in transition. As an example, coastal barrier beaches migrate landward in response to sea level rise – such migration tends to

occur during storms. Sand may overwash a dune and bury tidal wetlands behind it. This landward migration of the beach and burial of tidal wetlands is a natural process and will not be favorably reviewed.

There are various man-made causes of habitat degradation including but not limited to modifications of the tidal hydrology (ditching, draining, impounding), placement of fill, clear-cutting, fish passage obstruction, nutrient enrichment, etc. To help determine whether or not the project truly qualifies as restoration, refer back to the sections above or contact the habitat restoration coordinators. Describe whether the cause(s) of degradation is historic or on-going. If it is on-going, explain how you will eliminate or manage the source of degradation. Absent a clear understanding as to the basis for the degradation or loss of the habitat, restoration may be doomed to failure. For example, stormwater drains cause changes in hydrology, reduce salinity and can deliver sediment that bury aquatic habitat. Removal of stormwater sediment can temporarily restore the pre-disturbance habitat, but if the sediment source is not eliminated, the degradation will occur again. Restoration funds generally are only available for the restoration action and not to correct the source of degradation (e.g., stormwater retrofits).

7. Describe the existing habitat and describe the adverse impacts of the proposed habitat restoration.

There are various classifications that should be used to describe the existing habitat, such as the National Wetlands Inventory for wetlands and shallow waters. Plant community classifications should be used to characterize vegetation.

Example - Diked and drained tidal wetlands have reduced tidal flooding which can limit or even eliminate marsh invertebrates, and prevents access to the marsh by killifish. Oxidation of the soils in diked and drained tidal marshes causes pyrite to release sulfuric acid, and creates acid sulfate soils. The resulting low soil pH promotes the release of aluminum from soil minerals, which can be toxic at low concentrations to aquatic organisms. The degraded habitat is itself acting as a source of pollution, and restoration would eliminate water quality degradation and result in a positive impact upon the environment.

In describing the adverse impacts to the existing habitat, to merely state that there are no impacts absent an explanation as to how that conclusion is derived is not acceptable statement. All restoration projects result in the destruction of the current ecological matrix, and all habitats provide some level of ecological services - the impacts of losing these services must be outlined. Overall, the positive benefits from restoration must outweigh the impacts from restoration. In numerous situations, the former habitat type has been lost but converted to one that is otherwise healthy, for example, freshwater ponds created by damming former tidal wetlands. The present day ecological system, if healthy and functioning, may not be a good candidate for restoration making permit approval unlikely. There are numerous wetlands that have been destroyed through the placement of fill and converted to a different wetland type or even a terrestrial habitat.

8. Identify the restoration goals. Written goals define the specific state or condition that the restoration endeavors to attain. The goals will provide a basis for evaluating the restoration success at a later date. There are certain goals that are common to all restoration projects, such as restoring ecosystem integrity, health, and the potential for long-term sustainability. A project may have additional ecological goals, such as to provide habitat for particular species or to reassemble particular biotic communities.

A recently adopted goal of the Long Island Sound Study is to maximize high marsh habitat to provide longer marsh longevity, given recent predictions for accelerated sea level rise. Goal statements must address the degree to which recovery can be expected to reach a former state or trajectory. Restoration, *sensu stricto*, endeavors to return the degraded ecosystem to its precise pre-disturbance condition. In most, if not all cases, that is not attainable since detailed information about site elevations, soil properties, distribution of individual plants or clones, exact location of such features including tidal creeks, ponds, or natural oyster beds does not exist. From this emerge the goals of (a) “resetting the wetland on a long-term trajectory to becoming a self-maintaining ecosystem that is in dynamic equilibrium with sea level” and (b) reaching a target restoration that delivers an

ecosystem dominated by salt (polyhaline) marsh or brackish (mesohaline/oligohaline), yet without a specific, pre-determined amount of low marsh or high marsh habitat.

9. Discuss feasibility studies. Provide information obtained from preliminary feasibility studies, or explain why a study is not needed. For example, a proposal to increase tidal flow to a degraded marsh would need to document that flow restoration can occur without flooding adjacent low-lying properties and structures. A feasibility study in this example may include tide studies, elevation surveys, and modeling of tidal flow to demonstrate that tidal flow restoration is feasible without creating new, or exacerbating existing flooding problems. It may be that the vertical separation distance between the water and structures is so great, that no feasibility study is required. In some cases, existing flooding problems may even be eliminated through a properly engineered habitat restoration project. In addition to tide and elevation data, a typical feasibility study should include such items as vegetation surveys, preliminary design plans, stream surveys, etc (as applicable to the habitat type to be restored).

10. Describe the restoration project and attach plans and drawings. Provide a detailed description of all aspects of the restoration project. The level of detail required for plans and drawings is habitat and project-specific. Plans for the hand removal of invasive plants may only require a plan view showing the areas where hand pulling will occur. Aquatic restoration projects (i.e., tidal wetland restoration, fish passage projects, etc) will require detailed, scaled plan views and elevations. These engineered Project Design Plans are also required for obtaining coastal permits for work below the high tide line in Connecticut and New York. Please create Project Design Plans to meet the minimum specifications required by the appropriate regulatory agencies. **If the application is for design funds, please include evidence that the project is feasible.** If one is not required please provide an explanation (see item number 9). Upon project completion, final design plans that meet the specifications of applicable permitting programs will be among the required deliverables for design-fund grant awards.

11. Identify all required permits. Identify all required permits, and give their status (i.e., in preparation, submitted or approved), if applicable. In addition, contact the appropriate agency(ies) and obtain an estimate of the time anticipated for a permit to issue from the receipt of a complete permit application. A description of the permit status is important for the application reviewers to determine if the restoration proposal could be reasonably accomplished within the time constraints of the grant program (usually 1-2 years). Ideally, the most favorable review for an application seeking funding for construction is one where the permits have already been issued. The most common permit types necessary for habitat restoration projects in Connecticut and New York State are outlined in Chapter 2 of this document. **Please answer the following questions when submitting your Elements of a Complete Habitat Restoration Proposal:**

- Have you applied for permit? (yes/no); If yes, please list them.
- If yes, what is the anticipated issuance date?
- If no, have the applications been drafted? Do you need to hire a consulting engineer to help draft the application or prepare plans and conduct various studies to support the proposal?

12. Have reviews been conducted to determine if rare species are present at the project site? Provide information on whether a determination has been made regarding the presence of rare or endangered species or communities at the site. In Connecticut, applicants should consult the natural diversity database maps (http://www.ct.gov/dep/cwp/view.asp?a=2702&q=323464&depNav_GID=1628) and locate the project site. If the project area lies within a species circle, then further review must be conducted by the Connecticut Department of Environmental Protection. For instructions on initiating this review, refer to http://www.ct.gov/dep/cwp/view.asp?a=2702&q=323466&depNav_GID=1628&depNav=. In New York, please refer to the NYS Department of Environmental Conservation's Endangered Species page (<http://www.dec.ny.gov/animals/7181.html>) and the Natural Heritage Program for additional information (<http://www.dec.ny.gov/animals/29338.html>).

13. Identify strategies for long-term protection and management. Describe the anticipated long-term maintenance requirements, using studies or sources to support claims of low or no maintenance. The ideal restoration site is one that will be self-maintaining and will not require maintenance, such as restoration of tidal flow to a degraded tidal marsh. Projects that require a high level of maintenance may not be eligible for restoration funds (refer to the individual grant program guidelines). Restoration projects that are dependent upon successful invasive species control will have varying levels of long-term management to control invasive or prevent reinvasion. Applicants for habitat restoration projects that will be accomplished via invasive species control need to demonstrate how the long term monitoring and maintenance will be accomplished. All projects must include a 3-year (minimum) post-construction monitoring plan that includes maintenance if necessary.

14. Provide information related to global climate change specific to your site, including accelerated sea level rise. Include details about properties immediately landward of your site. Address climate change issues in your application. For example, how will temperature increases affect the potential success likelihood of a shellfish or eelgrass project, or the spread and control efforts necessary for invasive plants (aquatic or terrestrial). For sites that are affected by tidal action, such as tidal marshes, provide an assessment of the likely impacts of sea level rise upon the success and longevity of the project. In the case of a tidal marsh restoration, what is the relationship between the wetland and the adjacent uplands (i.e., is there opportunity for marine transgression; are the elevational gradients in the adjacent upland areas appropriate to accommodate salt marsh formation under conditions of marine transgression; is there a barrier such as a bulkhead between the wetlands and the uplands)?

15. Detail the restoration schedule. Provide a schedule of the steps required to implement the restoration (e.g., apply for permits, secure additional funding) and a schedule for construction, including details on contractor availability (if applicable). Identify any seasonal restrictions that limit the time when the restoration can occur (i.e., nesting of shorebirds, or the spring migration of diadromous fish, etc).

16. Identify archaeological impacts. State and federal grant programs may require an assessment of the potential archaeological impacts of a restoration project. Applicants are advised to contact the granting agency with respect to this evaluation.

Please direct any questions regarding these requirements to the habitat restoration coordinators.