LONG ISLAND SOUND HABITAT RESTORATION INITIATIVE

ANNUAL SUMMARY FOR THE YEAR 2000

Technical Support for Coastal Habitat Restoration

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BACKGROUND

This report summarizes the accomplishments of the Long Island Sound Study's (LISS) Habitat Restoration Initiative (HRI) for year 2000, the third year of implementation. The HRI is a bi-state, multi-organization effort to restore and enhance aquatic, wetland, and terrestrial coastal habitats in Connecticut and New York. In 1998, LISS HRI established the following goals:

- Restore the ecological functions of degraded and lost habitats;
- Restore at least 2000 acres of coastal habitats and 100 miles of riverine migratory corridor habitat over the next 10 years; and
- Use partnerships to accomplish the restoration objectives and to leverage limited state, local, and federal funds.

The HRI members meet several times a year to discuss progress, share new technologies, and identify emerging issues. Potential restoration sites were identified through interviews with knowledgeable individuals, and the public was provided an opportunity to nominate sites. These data have been compiled into a Habitat Restoration Geographic Information System. Sites were prioritized based upon biological principals. In 1998, the implementation of restoration projects began.

The Environmental Protection Agency's (EPA) Long Island Sound Study plays a major role in habitat restoration by providing annual funding to the New York Department of Environmental Conservation's Bureau of Marine Resources and to the Connecticut Department of Environmental Protection's Office of Long Island Sound Programs (OLISP).

In New York, due to limited in-house capacity for construction projects, most restoration projects are being carried out by local governments who have received funding under the 1996 New York State Clean Air / Clean Water Bond Act, Environmental Protection Fund, and other state, federal, and private grants. Projects receive technical and planning assistance from state staff and other members of the Habitat Restoration Workgroup.

The OLISP provides a coordination function for habitat restoration efforts in Connecticut. To that end, four habitat teams have been formed, which meet several times a year. These are Tidal Wetlands, Riverine Migratory Corridors, Coastal Barriers/Beaches/Dunes, and Eelgrass. The teams, composed of representatives from federal and state agencies, scientists, and non-governmental organizations, establish annual work plans. The lead agency or organization varies from project to project.

On September 27, 2000, eleven state, federal, municipal, and non-governmental organizations signed a Memorandum of Understanding (MOU) that codified their commitment to work cooperatively on the LISS HRI goals. In addition to supporting the specific restoration goals, the signers agreed to periodically review and update the Habitat Restoration Strategy and list of potential restoration sites, and also to involve interested and affected parties in the process. To view the MOU please visit the Long Island Sound Study

website: http://www.longislandsoundstudy.net/archive/misc/mou.pdf. For more information on the Habitat Restoration Initiative go to: http://www.longislandsoundstudy.net/habitatteam.htm.

2000 PROGRESS REPORT

In the third year of the ten-year program significant progress was made toward the restoration goals. Six tidal wetland projects were completed that resulted in 63.2 acres restored. For the other habitat types, six miles of riverine migratory corridor, two acres of freshwater wetland, 50 acres of coastal grassland and 0.5 acres of dune were restored. For the first three years of the HRI (1998–2000) the combined acres restored total 240.6, with tidal wetland making up the bulk of this figure.

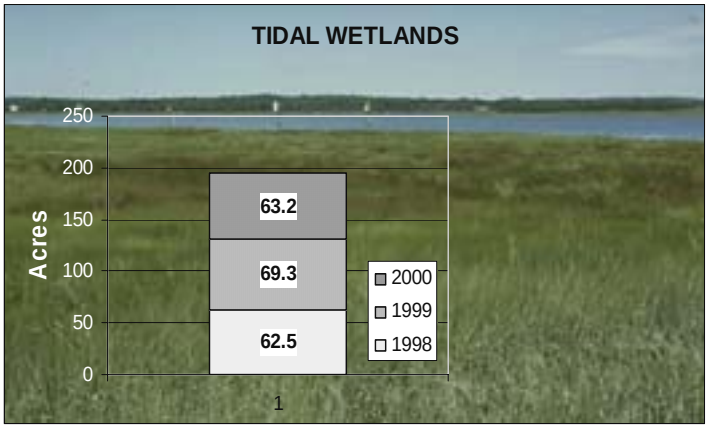
The following sections summarize restoration progress by the States of Connecticut and New York for tidal wetlands, riverine migratory corridors, beaches and dunes, coastal grasslands, eelgrass, and invasive aquatic plants.

TIDAL WETLAND RESTORATION

In Connecticut, the year 2000 work plan contained 20 tidal wetland projects (see **Table 1: Connecticut 2000 Habitat Restoration Workplan for Tidal Wetlands).** In addition to the two completed projects, progress was made on a number of other tidal wetland restorations. A public information meeting was held for the Sybil Creek wetland restoration in Branford to explain the preliminary design and to receive comments from the public. Appropriate recommendations will be incorporated into the final design. A contract was approved with Milone & MacBroom Inc. to proceed with the development of a final design for Old Field Creek in West Haven. OLISP and the Inland Waters Resources Management Division submitted an application for Clean Water Act Section 319 (nonpoint source) funds to support an assessment of the flooding impacts associated with tidal flow restoration on the Mill River in New Haven and development of final design plans.

As part of approving plans for Home Depot, wherein the stormwater discharges could adversely impact the downstream Chalker Beach Marsh, the Old Saybrook Inland Wetlands Commission required Home Depot to develop restoration plans for this marsh. OLISP provided technical guidance to the town and Home Depot on flooding and drainage issues that would need to be addressed in the plans. The Natural Resources Conservation Service (NRCS) representative to the tidal wetland restoration team arranged for site inspections of several tidal marshes by NRCS hydrologists to determine on which ones NRCS could conduct preliminary site assessments. At Lord Cove in Lyme, Connecticut, a contractor was hired to herbicide 150 acres of Phragmites in a brackish tidal wetland.

FIGURE S-1. Completed Tidal Wetland Project Acreage for 1998 – 2000



OLISP provided technical support to Coastal America, Duracell, and Northeast Utilities in the development of a Corporate Wetland Restoration Partnership in Connecticut. Two meetings were held in Connecticut to explain the benefits of wetland restoration to corporations and businesses and to invite them to donate funds or services to restoration projects.

In Connecticut, the following three tidal wetland projects were completed in 2000:

Nott Island, Lyme	24.0 acres tidal marsh
Hammonasset State Park, Madison	2.5 acres tidal marsh
Farm River Tributary at Edgemere Road	6.9 acres tidal marsh

In New York, the following three projects were completed in 2000:

Centre Island Wetland, Centre Island	25 acres tidal marsh
Edith Read Sanctuary, New Rochelle	0.5 acres tidal marsh
Pelham Bay Lagoon, Bronx	4.3 acres tidal marsh

Completed tidal wetland project acreage for 1998-2000 are presented in **Figure S-1**.

Table S-1: CONNECTICUT 2000 HABITAT RESTORATION WORK PLAN—TIDAL WETLANDS

SITE NAME	RANK	ACTIVITY	LEAD	NOTES	STATUS (12/31/2000)	ACRES
Sybil Creek, Branford	H	Complete Final Design Advertise for Construction?	OLISP	ISTEA/LISCA	Public info. meeting held. Waiting for scope of work for final design from M&M; LIS License Plate investigation completed	55 acres
Old Field Creek, West Haven	M	Conduct and complete final design.	OLISP	ISTEA/LISCA	Contract for semi-final and final design was signed.	7.6+ acres
Cove River, West Haven	M	Execute contract for final design and begin final design.	OLISP	ISTEA/LISCA		49.4 acres
Hammock River, Clinton	H	Execute contract for final design and begin final design.	OLISP	ISTEA/LISCA		200 acres
Bridgeport Airport	H	Execute contract for final design and begin final design	OLISP	ISTEA/LISCA		15 acres
Wilson Cove, Norwalk	M	Await EPA approval. Use funds to contract with WHAMM directly or through the City.	OLISP	EPA 319 funds, City of Norwalk	COP issued. Work to begin in 2001	5 acres
Bride Brook, East Lyme	UR	Forward a memo to Parks Division of DEP identifying staff recommendations. Identify a mechanism for developing final design plans.	OLISP/ Parks Division	No funding sources identified.	Still awaiting final report from Corps of Engineers	58.6 acres
Hammonasset East	UR	Complete remainder of project Anticipated completion date is winter 2000 (2.5 acres to be completed)	WHAMM	DU, USFWS, EPA 319, CT Waterfowl Assoc., LISCA	Completed	2.5
Indian Pond, East Lyme	UR	Develop design to connect to the pond directly to Niantic Bay to increase tidal flushing	WHAMM, OLISP	USFWS, WHAMM, Private, and Neighborhood Assoc.		10 acres
Beamon Creek, Old Saybrook	H	Contract with a consulting firm to develop preliminary engineering.	OLISP		Provided technical assistance to the Town of Old Saybrook regarding a Home Depot project in upper watershed. Home Depot has done some preliminary investigations regarding tidal flows and stormwater flow – no assessment of implications of flooding upon adjacent properties.	12 acres

(continued on next page)

Table S-1. CONNECTICUT 2000 HABITAT RESTORATION WORK PLAN—TIDAL WETLANDS *(continued from previous page)*

SITE NAME	RANK	ACTIVITY	LEAD	NOTES	STATUS (12/31/2000)	ACRES
Nott Island	H	Construct ditch plugs and ponds	WHAMM	Conte USFWS, NFWF, DU, Duck Stamp, CT Valley Shore Waterfowlers, CWA	Completed	40 acres
Lower CT River	H	Design ditch plugs/ponds; obtain permits	WHAMM	NAWMP, LISCA, TNC, CT Audubon, CWA, CT VW, DU, Duck Stamp	NOAA funded. Draft design done	300
Lost Lake, Guilford	H	Experimental restoration design with Coconut Fiber	OLISP		Site visits suggest we need a hydrological study to determine the impact of Route 146 on backwater flooding	
Lord Cove, Lyme	H	Phragmites Control	WHAMM	NRCS WHIP funds; DEP, TNC, USFWS, Potopaug	200 acres sprayed, to be mulched in 2001	200
Tuttle Pt., Guilford		Obtain Certificate of Permission (COP) for cleaning out main channel	OLISP	WHAMM FUNDS	Draft COP done	4
Lynde Point, Old Saybrook (Fenwick)	H	Coordinate w/ Borough, Identify fudning, Proceed to design phase	WHAMM	Lynde Point Land Trust, Borough of Fenwick, O.S. Conservation Commission, USFWS, NOAA, NRCS WRP	Some preliminary engineering data have been compiled by a local engineering firm for Lynde Point.	10
Popes & Long Isls. Housatonic River	UR	Obtain Certificate of Permission for construction of ponds	WHAMM	WHAMM AND USFWS	C.O.P. was obtained and ACOE REC'D	20
Great Meadows, Stratford	H?	Complete sediment testing Identify funding	USFWS	USFWS, DEP	Funding identified PERMITS REC'D	27
Fivemile River Marsh		ID funding, Preliminary design? Proposed restoration using cocofiber	Save the Sound	NOAA, STS funds		
Camp Harkness	M	Develop design and obtain permits.	WHAM, OLISP	No funding sources identified.		11 acres

NOTT ISLAND

State: Connecticut
Town: Lyme
Habitat Type: Tidal Wetlands and Coastal Grassland (see **Section 4: Coastal Grasslands**)
Acres: 24 acres wetlands

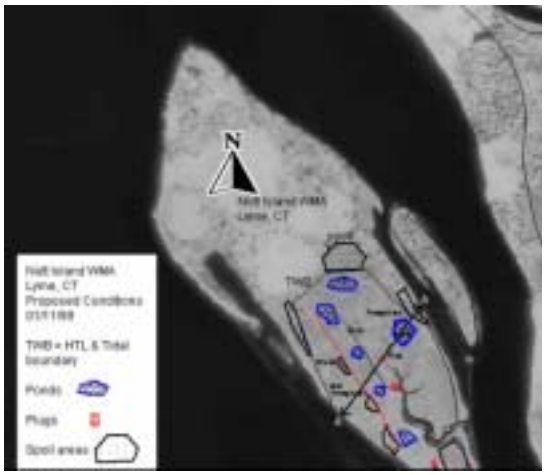
Cause of Degradation: Replacement of the native brackish marsh vegetation by the invasive grass *Phragmites australis.*

Project Description: The project consisted of plugging mosquito ditches, creating ponds for fish and wildlife, and spraying Phragmites with the herbicide Rodeo, followed by mowing.

Implementation Partners: Connecticut Department of Environmental Protection Wetland Habitat and Mosquito Management.

Funding provided by: U.S. Fish and Wildlife Service – Silvio O. Conte National Fish and Wildlife Refuge, National Fish and Wildlife Foundation, Ducks Unlimited, Connecticut Valley Shore Waterfowlers, Connecticut Waterfowl Association, Duck Stamp.

Aerial view showing the ponds constructed for fish and wildlife habitat



Design plans for Nott Island

HAMMONASSET STATE PARK, MADISON

State: Connecticut
Town: Madison
Habitat Type: Tidal Wetland
Acres: 2.5

Cause of Degradation: During the 1950s, portions of the Hammonasset wetlands were used as disposal areas for sandy sediment that was dredged from the nearby Clinton Harbor. Low earthen dikes were constructed around certain wetland areas and the sand was hydraulically pumped to the Park. At this particular location, certain areas of the wetland had been converted to upland supporting grasses and red cedar, while other portions still remain or became degraded salt marsh. More recently, the invasive plant common reed (*Phragmites australis)* colonized most of the degraded wetland portions.

Project Description: Restoration of approximately five acres of tidal wetland was accomplished through the removal of 1–3 feet of sandy dredged sediment (stippled areas in the drawing to the right). Four ponds (diagonal lines) were constructed and a network of meandering creeks was installed to provide adequate tidal flushing. During this calendar year the southern 2.5 acres of the wetland was restored; the northern 2.5 acres were completed in 1999. A portion of the excavated sands were placed and graded on the adjacent upland and then planted with warm season grasses, such as little bluestem.

Partners: U.S. Fish & Wildlife Service, Connecticut Department of Environmental Protection Wetland Habitat and Mosquito Management, Office of Long Island Sound Programs, U.S. Environmental Protection Agency – Long Island Sound Study and Section 319 Program, Ducks Unlimited, and Connecticut Waterfowlers Associations.

Northern area of excavation, one year post-restoration

Northern area of excavation, two years post-restoration. Plants such as* Salicornia *spp.,* Distichlis spicata *and* Spartina alterniflora *are colonizing the bare peat.

FARM RIVER TRIBUTARY MARSH

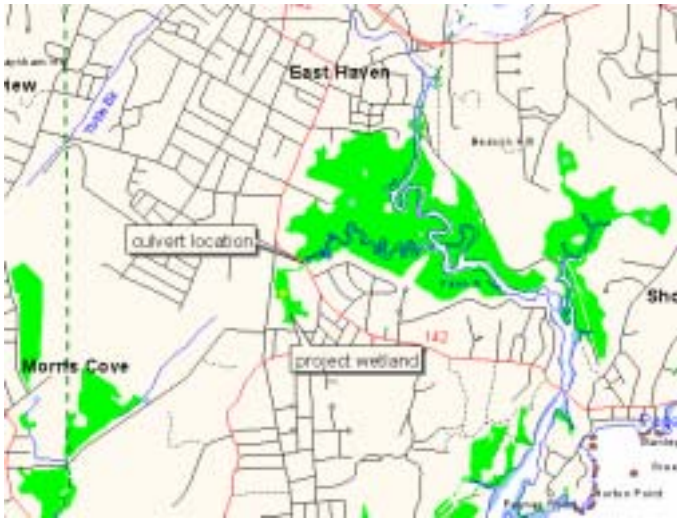
State: Connecticut
Town: East Haven
Habitat Type: Tidal Wetland
Acres: 6.9

Cause of Degradation: An undersized culvert beneath a road prevented full tidal flushing of a wetland on a tributary of the Farm River (see **Figure S-2**). The culvert had also partially collapsed.

Project Description: The old stone culvert was replaced with a larger aluminum pipe to provide increased tidal flushing. In addition, the new pipe was set at a lower invert elevation to allow better draining of the marsh at low tide.

Partners: Connecticut Department of Transportation, Connecticut Department of Environmental Protection.

Figure S-2. Location of the Farm River Tributary Marsh Project



CENTRE ISLAND WETLAND

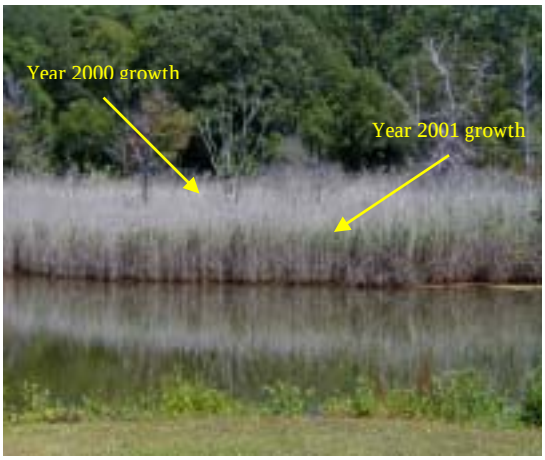
Checking elevations of newly installed pipes

State: New York
Town: Oyster Bay
Habitat Type: Tidal Wetlands
Acres: 25

Cause of Degradation: A driveway was constructed across a tidal creek and fitted with a severely undersized culvert, resulting in restricted tidal flow to a marsh and pond upstream of the driveway. The invasive grass Phragmites australis had displaced the marsh vegetation, and the pond was negatively affected by waterfowl wastes due to a growing population of resident Canada geese.

Project Description: The driveway was fitted with two new side-by-side 36-inch diameter culverts. One culvert is fitted with a flapper tide gate. The other is fitted with a self-regulating tide gate. The latter allows tidal water to enter the marsh, and the floats are set to close the gate at tidal levels that would flood low-lying properties upstream of the tide gates. The increased salt and sulfide concentrations in the marsh are causing the typical gradual reduction of *Phragmites australis* and in several years the native salt marsh vegetation will replace this grass.

Partners: Village of Centre Island, U.S. Department of Agriculture's Natural Resource Conservation Service, New York State Department of Environmental Conservation, New York State Department of State, Friends of the Bay, private landowners.



The dramatic reduction in the height of the* P. australis *after one growing season is visible in this photo. The horizontal line of light gray seen just above mid-photo shows maximum growth in year 2000. The darker line of vegetation below it shows maximum growth for year 2001.

The pipe on the right is a self-regulating tide gate, the pipe on the left is a flapper gate.

EDITH READ NATURAL PARK AND WILDLIFE SANCTUARY

State: New York
Town: New Rochelle
Habitat Type: Tidal Wetlands
Acres: 0.5

Cause of Degradation: Wave energy on a stretch of shoreline within the sanctuary had scoured away the intertidal marsh.

Project Description: The remaining patches of healthy marsh to either side of the eroded area were used to benchmark replanting elevations. Surface cobble was scraped away to allow for denser planting and root development. The scraped area was then backfilled with four inches of clean sand as a planting substrate, and covered with coconut fiber mesh to help anchor the new plants during root development. The edges of the planting area were further protected with coconut fiber rolls filled with rocks placed parallel to the shore at the landward and seaward edge of the planting area to act as wave breaks. The initial site investigation revealed that not only were incoming waves causing the erosion, but reflected wave energy from the shoreline was contributing to the marsh loss as well. Once the site was fully prepared, two inch *Spartina alterniflora* plugs were planted across the site.

Edith Read marsh after restoration

Partners: Westchester County Department of Planning, Westchester County Department of Parks, Recreation, and Conservation.

See also: http://www.westchestergov.com/planning/environmental/default.htm
Select Long Island Sound Watershed Program from menu

PELHAM BAY LAGOON

State: New York
Town: Bronx
Habitat Type: Tidal Wetlands
Acres: 4.3

Cause of Degradation: Filling

Project Description: This project restored tidal flow to a formerly filled marsh dominated by *Phragmites australis*. The fill was excavated to a depth that allows higher salinity water to inundate the site and suppress the *P. australis*, while supporting a low marsh fringe and small section of high marsh.

Partners: New York City's Department of Parks and Recreation, New York State Department of Environmental Conservation. Funding provided by Natural Resources Damages Award from the Exxon *Bayway* oil spill.

Area of fill before excavation

Project area after excavation and planting

RIVERINE MIGRATORY CORRIDOR RESTORATION

The Connecticut Riverine Migratory Corridor team, led by the Connecticut Department of Environmental Protection Inland Fisheries Division, completed two projects totalling six river miles restored, and worked on eleven others that were in various stages of development. The completed projects are described in detail on the following pages. The 2000 work plan contains descriptions of all 13 projects (see **Table S-2: Connecticut 2000 Workplan for Riverine Migratory Corridor Anadromous Fisheries Resoration**).

Highlights of progress for ongoing migratory fish passage projects include:

- Completion of conceptual plans and start of final design on a fish and canoe bypass at the Tingue Dam, Naugatuck River, in Seymour, Connecticut.
- Construction start on a steeppass fishway at Pond Lily Dam on the West River in New Haven, Connecticut.
- Completion of conceptual plans for a steeppass fishway at Vintons Millpond Dam on the Podunk River in South Windsor. Partial funding was secured.

New York's portion of the Sound shoreline presents significantly fewer opportunities for riverine migratory corridor restoration. However, those opportunities that do arise are very important to the overall health of riverine species, and in the reduction of sediment and nutrients reaching Long Island Sound. The projects described are riparian or streambank enhancements and not migratory fish restoration projects that consist of dam removals or fishway installations. Therefore the miles for New York's projects are not included in the totals for riverine migratory corridors.

The ten-year goal (1998–2007), for this habitat type is 100 river miles. To date, 31.9 river miles have been restored through dam removal and fish passage projects. River mileage for projects completed in 1998–2000 are presented in the **Figure S-3**.

FIGURE S-3. River Mileage for Projects Completed in 1998–2000

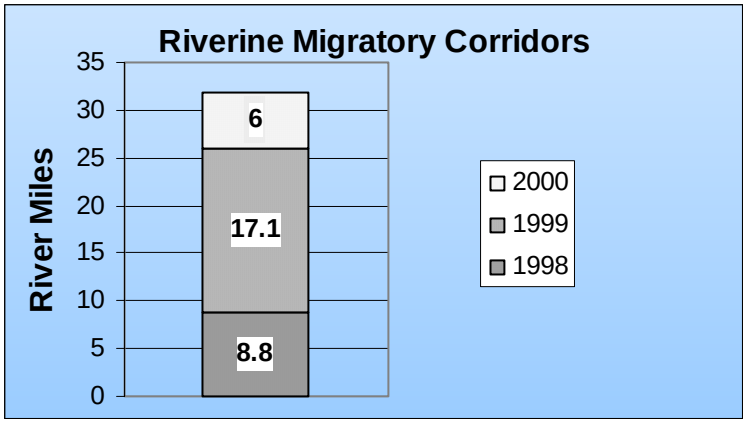


Table S-2. 2000 ANNUAL ANADROMOUS FISHERIES RESTORATION WORKPLAN—FISH PASSAGE

SITE NAME	*RANK*	*ACTIVITY*	LEAD	NOTES	STATUS (12/31/00)	*MILES*
Tingue Dam (Naugatuck River, Seymour)	H	Design and construct a fish and canoe bypass around a 15 ft high dam.	Water Mgmt-P&S DEP/Fisheries	Part of the comprehensive Naugatuck River project. To be funded and owned by the DEP.	Conceptual plans completed. Final design and permit underway. Plan to construct in 2001.	10.6
Pond Lily Dam (West River, New Haven)	H	Construct a steeppass fishway around a 5 ft high dam, the first on the river.	DEP Fisheries	Partnered with the New Haven Land Trust, dam owner, USFWS, CWRP. NRCS WHIP grant also.	Construction begun. Original contractor replaced. To be completed early 2001.	1
Ed Bill's Pond Dam (E.Branch Eightmile River, Lyme)	M	Construct a steeppass fishway under a Town-owned bridge and around a 9 ft. high dam.	Fisheries, CT River Watershed Council (CRWC)	Partnered w/ (CRWC), Lyme Land Trust, NRCS, & dam owner. Funded with a variety of sources.	Completed Oct. 2000.	4
Jordan Millpond Dam (Jordan Brook, Waterford)	M	Design and construct a steeppass fishway at Town-owned 8 ft high dam, first on stream.	Fisheries / OLISP	Funded by a damage settlement through the DEP and NOAA. (RTC-380 oil spill). Partnered with Town.	Received final approval by NOAA. Design, permitting and construction now slated for 2001.	1
Merwin Meadows (Norwalk River, Wilton)	UR	Remove dam and reconstruct channel	NRCS, NRWI	Partners include DEP, EPA, TU, Save the Sound, NOAA, NRCS, and watershed towns	Preliminary design and cost estimate completed by NRCS. Need final design, sediment sampling.	
Hyde Pond Dam (Whitfords Brook, Groton)	H	Improve an existing steeppass fishway by adding another section of steeppass to the bottom, thus reducing slope and increasing efficacy.	Fisheries Division/ OLISP	Funded by an a damage settlement through the DEP and NOAA. (RTC-380 oil spill). Partnered with Town.	Complete except for signage. An eelpass will be installed in 2001.	2

(continued on next page)

SITE NAME	*RANK*	*ACTIVITY*	LEAD	NOTES	STATUS (12/31/00)	*MILES*
Starr Mill Pond Dam (Coginchaug River, Middletown)	H	Develop plans for two options for owner's review: total dam removal and construct a steeppass fishway.	CRWC Fisheries Div	Funded by a mitigation agreement between CRWC and PDC.	Engineering analysis for dam removal options was completed.	0.5
Spring Street Dam (Coginchaug River, Middletown)	H	Same as above.	Same as above	Same as above.	Same as above.	1
Vinton Millpond Dam (Podunk River, South Windsor)	M	Design a steeppass fishway around a 9 ft high dam, first on river. Final designs to be developed for permitting and fund raising.	CRWC Fisheries Div	Partially funded through USFWS. Partnered with USGS-BRD, CRWC, land trust, and dam owner.	Conceptual plan developed.	2
Bunnell Pond Dam (Pequonnock River, Bridgeport)	H	Build a steeppass fishway at the 20+ ft high state-owned dam at Beardsley Park.	Water Mgmt-IWRD	Part of a dam repair project by the DEP.	Completely designed; waiting for State Bonding Commission to release funds.	3
Cannondale Dam (Norwalk River, Wilton)	L	Design and build a fish bypass around a 5 ft high dam, the third on river. Will benefit riverine species until anadromous species gain access to upper river.	NRCS	Funded by NRCS- WHIP. Conceptual design by Fisheries Division.	Awaiting final designs and permitting process.	3
Upper Millpond Dam (Mill Brook, Old Lyme)	M	Design a steeppass fishway around a 9 ft high dam, the second on the brook. The first has an operational fishway.	CRWC Fisheries Div	Partially funded through a variety of sources. Partnered with the CRWC, the Old Lyme Land Trust.	Completed negotiations with the landowner. Archeology survey completed.	0.75
Rogers Lake Dam (Mill Brook, Old Lyme)	M	Design a steeppass fishway around a 5 ft high Town-owned dam, the third on the brook. See above.	See above.	See above. The Town will be an additional partner.	Preliminary. Awaiting several agreements.	2 (265 acre lake)
Hallville Pond Dam (Hallville Brook, Preston)	H	Design and plan a steeppass fishway around a 13 ft. high dam, the first on the brook.	OLISP/ Fisheries Division	Targeted for with a mitigation agreement with the Fishers Island Ferry District.	Preliminary. Awaiting several agreements.	1 but additional miles likely in future.

Table S-2. 2000 ANNUAL ANADROMOUS FISHERIES RESTORATION WORKPLAN—FISH PASSAGE *(continued from previous page)*

ED BILL'S POND DAM

State: Connecticut
Town: Lyme
River: Eightmile River, East Branch
Habitat Type: Riverine Migratory Corridor
River Miles: 4.0

Cause of Degradation: Dam that obstructs fish passage.

Project Description: A steeppass fishway was installed underneath a town bridge. It includes one intermediate resting pool and a special downstream passage pipe. This site represents the second fishway on the Eightmile River system and opens up extensive spawning and nursery habitat for various anadromous species.

Steeppass fishway installed beneath a town bridge

Partners: Connecticut Department of Environmental Protection Inland Fisheries Division (co-lead), Connecticut River Watershed Council (co-lead), U.S. Department of Agriculture's Natural Resources Conservation Service, Lyme Land Conservation Trust, NOAA, Fish America Foundation, and Connecticut Corporate Wetlands Restoration Partnership.

Beneficiary Species: Atlantic salmon, alewife, blueback herring, sea-run brown trout, sea lamprey.

HYDE POND DAM

State: Connecticut
Town: Mystic
River: Whitford Brook
Habitat Type: Riverine Migratory Corridor
River Miles: 2.0

Cause of Degradation: The existing fishway, built in 1985, had fallen into disrepair.

Project Description: Add a unit of steeppass fishway in order to flatten the slope and improve fish passage. The fishway was also straightened and wooden components were replaced with aluminum. The earthen dam was cleared of vegetation.

Steeppass fishway unit added at Hyde Pond Dam

Partners: Connecticut Department of Environmental Protections Inland Fisheries Division (lead), Waste Management Bureau (funded project[1]), and Office of Long Island Sound Programs; Town of Groton; NOAA; Ledyard High School; and Kevin Mizak (private landowner).

Beneficiary Species: Alewife, blueback herring, sea-run brown trout.

[1]Used funds from the Natural Resources Damage Restoration Fund secured from an oil spill responsible party pursuant to the Oil Pollution Act of 1990.

EAST CREEK

State: New York
Town: Mamaroneck
Habitat Type: Riparian, Freshwater Wetland
River Miles: 600 linear feet

Cause of Degradation: Building of a middle school on adjacent property resulted in the creek being culverted under the construction site in the 1960s.

A view of East Creek prior to the project

East Creek following the bank stabilization and planting

Project Description: The former tidal creek had become stagnant and choked with sediment and *Phragmites australis*. An auto body repair shop had also operated near the project site and filled the creek area with a mixture of debris. The project began with installation of a tide gate to cut off the remaining sporadic tidal flow which was contributing to the invasion by *P. australis.* The auto body shop debris and some fill were excavated to recreate an emergent freshwater wetland. The stream banks were stabilized using coconut fiber blankets and planting marsh vegetation.

Partners: Westchester County Department of Planning, Village of Larchmont, Town of Mamaroneck.

See also: http://www.westchestergov.com/planning/environmental/default.htm
Select Long Island Sound Watershed Program from menu

INLAND WETLAND RESTORATION AND OTHER HABITAT ENHANCEMENTS

PAINE LAKE

State: New York
Town: New Rochelle
Habitat Type: Freshwater Wetland
River Miles: 250 linear feet

Cause of Degradation: Stephenson Brook was dammed in the past to create a stormwater management basin that was used to hold runoff from adjoining neighborhoods.

Project Description: Dam removal was undesirable so the basin was re-shaped to create an aquatic bench which was then planted with freshwater emergent wetland species to provide food and shelter for fish and wildlife species. The top edge of the basin was converted from weedy growth to a filter strip of shrub and herbaceous species. A floating mat of emergent vegetation was placed in the open water area to increase nutrient uptake in the basin prior to discharge to Stephenson Brook and ultimately, Long Island Sound.

A unit of the floating wetland armature prior to planting. The gray material is high buoyancy foam. Coconut fiber "logs" on either side provide a planting substrate.

The floating wetland shown in place after planting the armature and connecting several units.

Partners: Westchester County Department of Planning, City of New Rochelle.

See also: http://www.westchestergov.com/planning/environmental/default.htm
Select Long Island Sound Watershed Program from menu

WYKAGYL COUNTRY CLUB POND

State: New York
Town: New Rochelle
Habitat Type: Freshwater Wetland
Acres: 2.0

Cause of Degradation: The pond was originally created by placing a weir in a natural stream on site. The pond is now within a golf course owned by the Wykagyl Country Club. The course greens had been maintained right to the pond edge resulting in nutrient loading and a lack of cover vegetation for fish and wildlife species.

Project Description: The pond shoreline was altered to a gradually sloping wet meadow. The interior of the pond was then deepened and an aquatic bench formed around the edge. The bench was planted with emergent wetland plants, which provide cover and food for visiting fish and wildlife species, as well as trapping sediment and nutrients from the adjacent turf. The stream draining the pond eventually reaches the Sound.

The short vegetation to the right of the picture is wet meadow herbaceous species. The taller patch to the left on the shoreline are sedges.

This picture shows a biolog placed along the pond shore and planted with irises.

Partners: Westchester County Department of Planning, Wykagyl Country Club, and City of New Rochelle.

See also: http://www.westchestergov.com/planning/environmental/default.htm
Select Long Island Sound Watershed Program from menu

COASTAL GRASSLANDS

Coastal grasslands are an exceedingly rare habitat type in the Long Island Sound watershed. Few opportunities exist to restore these habitats, which support a number of rare and endangered plant and animal species.

One project was completed in New York in 2000, which resulted in the restoration of 50 acres. See following page for summary.

In Connecticut one project was completed that created 20 acres of warm season grassland.

NOTT ISLAND

State: Connecticut
Town: Lyme
Habitat Type: Coastal Grassland
Acres: 20

Cause of Degradation: dredge spoil fill of tidal wetlands

Project Description: The sandy dredge spoil areas adjacent to the tidal wetland restoration project site were planted with warm season grasses. Although this area was all tidal wetland at one time, dredge sediments from the Connecticut River boating channel were deposited on the northern half of the island. The removal of these sediments to restore tidal wetland was not feasible, but enhancing the area by creating coastal grassland habitat was deemed worthwhile and cost-effective.

Planting warm season grasses at Nott Island

Implementation Partners: Connecticut Department of Environmental Protection Wetland Habitat and Mosquito Management.

Funding provided by: U.S. Fish and Wildlife Service – Silvio O. Conte National Fish and Wildlife Refuge, National Fish and Wildlife Foundation, Ducks Unlimited, Connecticut Valley Shore Waterfowlers, Connecticut Waterfowl Association, and Duck Stamp.

ORIENT POINT COUNTY PARK

State: New York
Town: Southold
Habitat Type: Coastal Grassland
Acres: 50

Switchgrass and bluestem during the first growing season

Cause of Degradation: This site was formerly a farm field, thought to have been in cultivation from the period of colonial settlement on Long Island. Suffolk County Department of Parks and Recreation purchased the property in the early 1980s and the land lay fallow until 1998, only being used for passive recreation and fishing access with no site improvement or management other than mowing of access trails. The site had become colonized with successional shrub and weed species, several of which were invasive species, like the multiflora rose, *Rosa multiflora*. The underlying soil profile was consistent with other maritime grassland areas on Long Island, making this site a suitable candidate for grassland restoration. The rarity of coastal grasslands makes this a particularly valuable opportunity.

Project Description: The work was phased over three seasons, resulting in approximately 15 acres being completed at a time. Work areas were cleared of most of the brush using chain saws, then the remaining overgrown areas were cleared using a "brush hog" mower. A tractor was then brought in to plow, disk, and sow the clearings with a mixture of warm season grasses including little and big bluestem, and switchgrass. A few "islands" of shrubs and small trees were left to provide cover for smaller fauna, and existing large trees were left on the edges of the park to provide roosting areas for raptors.

Plowing the field before planting

Partners: Suffolk County Parks, U.S. Environmental Protection Agency, Town of Southold, U.S. Fish & Wildlife Service, New York State Department of Environmental Conservation.

BARRIER BEACHES AND DUNES

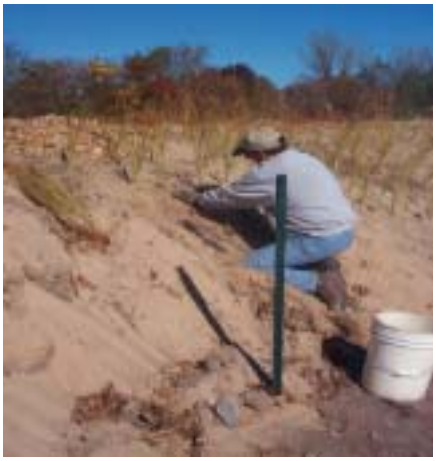
In July of 2000, the Connecticut Department of Evironmental Protection assembled a committee to oversee the restoration of coastal barriers and coastal grassland. Short term goals of the group include identifying potential restoration sites by on-site evaluation and assigning priority. The main causes of degradation identified thus far are loss of vegetation due to human disturbance (trampling of vegetation) and replacement of native vegetation by invasive weeds. A beaches and dunes GIS (Geographic Information Systems) project was created to simplify sharing information with team members and will be used to set restoration priorities. In the future, the GIS project will include a linking tool so that digitized photos, text documents, and other files, which will summarize the restoration activities at a site, can be easily accessed by simply clicking on that particular site.

EDITH READ NATURAL PARK AND WILDLIFE SANCTUARY

State: New York
Town: New Rochelle
Habitat Type: Dune
Acres: 0.5

Cause of Degradation: Unknown

Project Description: An adjacent flood protection berm created following the December 1992 Nor'easter had become dominated by *Phragmites australis*. The berm was converted to a coastal dune system by the addition of clean sand and planted *Ammophila brevigulata,* restoration activities that serve to enhance the educational opportunities at the site as well as to protect the newly recreated marsh from wave action.



Planting the newly reconstructed dune

The dune after a few months of growth

Partners: Westchester County Department of Planning and Westchester County Department of Parks, Recreation, and Conservation.

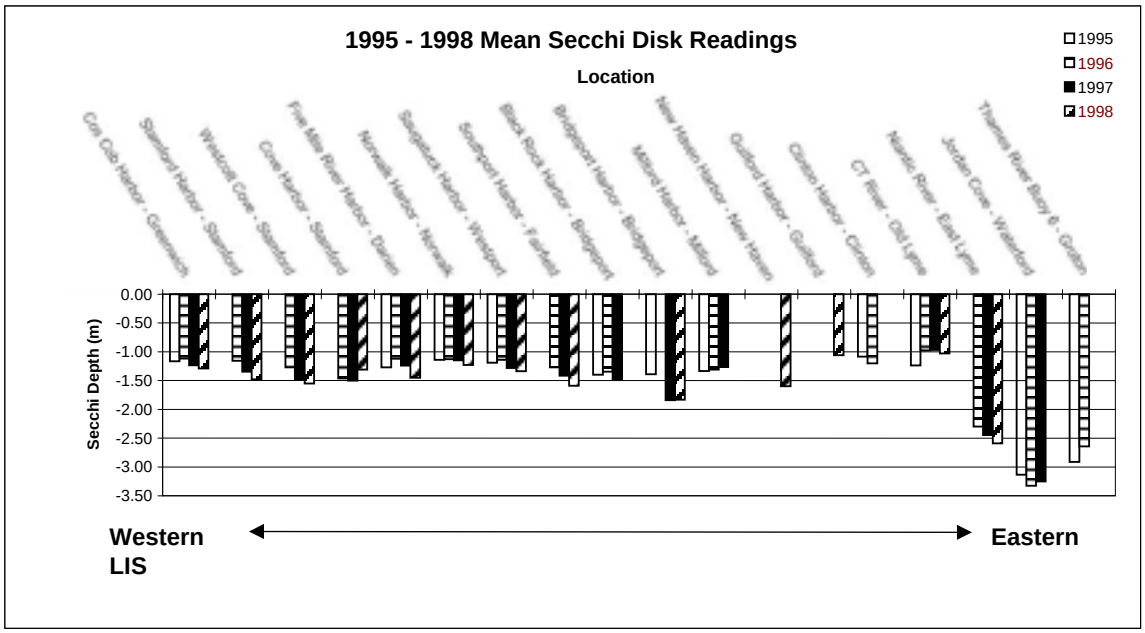
SUBMERGED AQUATIC VEGETATION

The dominant submerged aquatic vegetation in Long Island Sound is eelgrass (*Zostera marina*). Historically, eelgrass occurred throughout the Sound and occurred in shallow waters (less than three feet below mean low water in the western Sound and less than 15 feet in the eastern Sound). There was a major decline of eelgrass throughout its range in the Atlantic in the early 1930s. This most likely was the result of a major climatic phenomenon such as El Nino or La Nina. By the 1950s, natural restoration of eelgrass beds had occurred in only eastern Long Island Sound but not in the central and western Sound. It is suspected that the poor recovery success was due to a combination of the higher tide range in this portion of the Sound and nitrogen enrichment *(i.e.*, promoting greater plankton production which reduced light availability). The Connecticut Department of Environmental Protection's Long Island Sound Research Fund provided Dr. Charles Yarish with a grant to map eelgrass beds in Connecticut in 1993 and 1994. The westernmost beds were found at Clinton Harbor and they were characterized as "stressed". For the most part, eelgrass beds chiefly occur east of the Connecticut River and the 1993–94 acreage was less than 700 acres. There is anecdotal evidence to suggest that existing beds are declining as a result of nonpoint source nitrogen enrichment. The declines of beds in Little Narragansett Bay are likely due to nitrogen enrichment from two sewage treatments plants that discharge to the Pawcatuck River.

The Connecticut submerged aquatic vegetation restoration team has decided to not undertake expensive eelgrass restoration projects until it has been determined that water quality is adequate to support such efforts. Elsewhere, such as in Rhode Island, restoration projects have largely failed and programs have learned to examine water quality more carefully. Associated with the Research Fund grant described above, Dr. Evamarie Koch studied and determined the water quality requirements for eelgrass in Long Island Sound. Unfortunately, there are no available funds to adequately monitor nearshore water quality. In 1995, the Department of Environmental Protection's Office of Long Island Sound Program initiated a volunteer secchi disk monitoring program as a means of assessing light availability. From the 1995–1998 summary presented in **Figure S-4**, secchi disk values are less than 1.6 yards throughout the Sound except in eastern Long Island Sound.

Although water clarity and light availability are very good in the Niantic River, eelgrass beds continue to

Figure S-4. 1995 – 1998 Mean Secchi Disk Readings



decline. While nonpoint source nitrogen enrichment is the most likely cause of this decline, the nitrogen is producing phytoplankton, which in turn reduces light availability. It is also known that nitrogen may promote the growth of benthic algae, which at certain heights can shade and promote the loss of eelgrass.

The submerged aquatic vegetation restoration team believes that scientific studies need to be conducted to evaluate the nitrogen loadings from all sources but especially the uplands (*i.e.*, septic systems, lawn fertilizers) to determine the cause of the declines and make recommendations for the management of nitrogen.

The only submerged aquatic vegetation restoration project conducted in 2000 was a series of projects in the Hartford area to control populations of a highly invasive aquatic plant, water chestnut (*Trapa natans*), that had been discovered in 1999. While this project is outside the ecological boundary for the Long Island Sound Study's Habitat Restoration Initiative, the project has significance to the protection of submerged aquatic vegetation that occurs in the estuary of the Connecticut River. The estuary of this river and the tidal (freshwater) river upstream to Portland and Cromwell have been designated as Wetlands of International Importance under the Ramsar Convention. One of the bases for that designation is the ecologically-significant submerged aquatic vegetation beds supporting plant species typical of tidal freshwater and brackish water environments such as American tapegrass (*Vallisneria americana)* and numerous pondweeds (*Potamogeton* spp.) If left uncontrolled, water chestnut has the potential to spread downstream at least as far as the brackish waters of Essex.

RESTORATION OF HOCKANUM, CONNECTICUT, AND PODUNK RIVERS: WATER CHESTNUT REMOVAL

In 1999, two populations of the non-native invasive aquatic weed, water chestnut (*Trapa natans*), were discovered by Connecticut Department of Environmental Protection staff: one was a 0.25 acre area in Keeney Cove, a freshwater tidal cove in Glastonbury. The other site was an estimated seven-acre area in the Hockanum River in East Hartford. The recently discovered populations of water chestnut in Connecticut, if left unchecked, pose a threat to the biological diversity of the lower Connecticut River. The dense growth of water chestnut can shade out the native submerged aquatic vegetation and can make recreational activities such as boating and fishing nearly impossible. Since water chestnut is an annual, effective control, even eradication, can be accomplished by removing plants in the summer before they can drop their mature fruits.

The water chestnut-infested impoundment on the Hockanum River before harvesting began

Mechanical harvesting of water chestnut in the Hockanum River commenced on June 28, 2000. Cut plants were loaded onto a dump truck on shore and brought to the E. Hartford landfill. Some areas of the Hockanum River were too shallow for the weed harvester to operate. Therefore, labor intensive hand-pulling by Department of Environmental Protection staff and other volunteers was required to remove the remaining plants. The following organizations assisted or sent staff and/or volunteers for hand-pulling: The Nature Conservancy, Connecticut River Watershed Council, NOAA Restoration Center, Hockanum River Watershed Association, Cellu-Tissue Corp., United Technologies Corp., U.S. Fish and Wildlife Service (Stewart B. McKinney National Fish and Wildlife Refuge, New England – New York Bight Coastal Ecosystem Program, and Silvio O. Conte McKinney National Fish and Wildlife Refuge), and Connecticut Sea Grant.

Mechanical harvester cutting and removing water chestnut from the Hockanum River

Removal efforts completed

A total of approximately 50 tons, wet weight, of water chestnut was removed from the Hockanum River. A large reduction in the plant population is expected next year since all of the existing population was removed.

For a second year in a row, water chestnut was hand-pulled from the Keeney Cove-Connecticut River site. The 2000 population at this site was reduced to only a few scattered plants from the initial 1999 estimate of 0.25 acre.

Department of Environmental Protection staff discovered a new population of water chestnut, estimated to be 0.25 acre, at Vintons Millpond on the Podunk River in South Windsor. Connecticut River Watershed Council took the lead on hand-pulling this infestation.

As a result of efforts in 2000, a significant reduction in the size of the Hockanum River water chestnut population is anticipated, but mechanical harvesting will likely still be needed in 2001.