LONG ISLAND SOUND STUDY HABITAT RESTORATION INITIATIVE

ANNUAL SUMMARY FOR THE YEAR 2008

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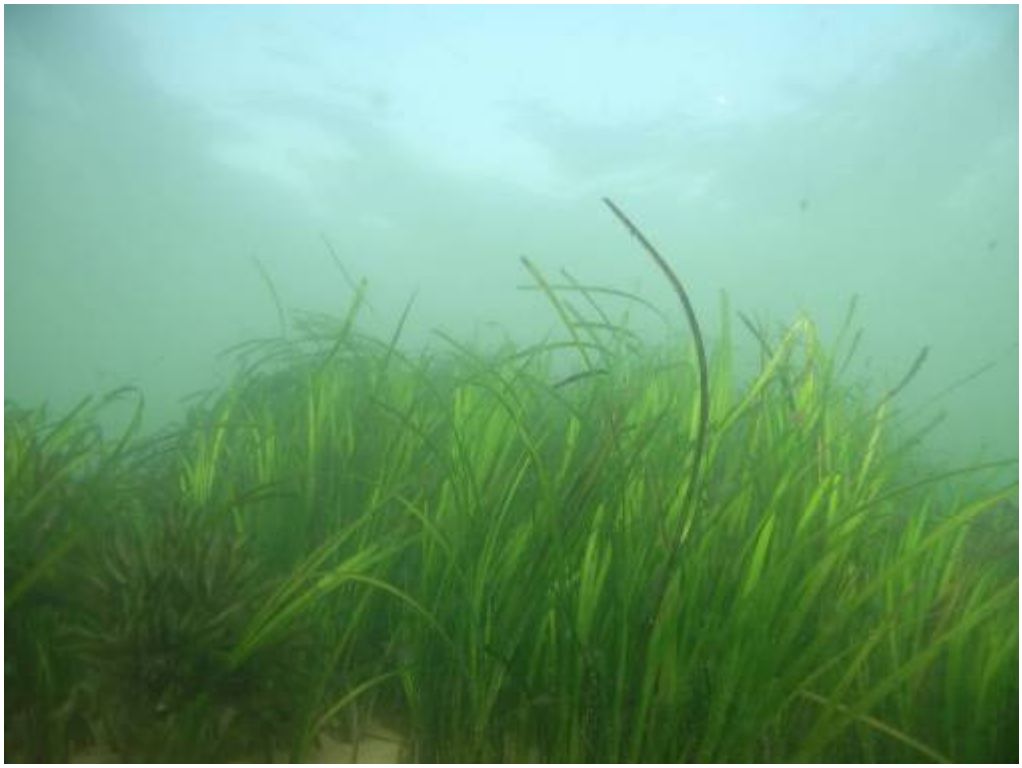

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BACKGROUND

This report summarizes the accomplishments of the Long Island Sound Study's (LISS) Habitat Restoration Initiative (HRI) for year 2007, the eleventh year of implementation. The HRI is a bi-state, multi-organizational effort to restore estuarine coastal habitats in Connecticut and New York. The HRI members meet three times a year to discuss progress, share new technologies, and identify emerging issues. In 1997, the 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.

Potential restoration sites were identified through interviews with individuals knowledgeable with the states' ecosystems, and through a public nomination process. This information was compiled into a Habitat Restoration Geographic Information System, and published in a brochure called "Restoring Long Island Sound's Habitats". Implementation of HRI goals began in 1998. Twelve priority coastal habitat types have been identified by the HRI members as particularly important to sustaining the living resources of the Long Island Sound ecosystem. These habitat types are Tidal Wetlands, Freshwater Wetlands, Riverine Migratory Corridors, Submerged Aquatic Vegetation, Coastal Grasslands, Intertidal Flats, Estuarine Embayments, Coastal and Island Forests, Shellfish Reefs, Cliffs and Bluffs, Rocky Intertidal Zones, and Coastal Barriers, Beaches, and Dunes.

In 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. To view the MOU, please visit the LISS 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.

The Policy Committee, comprised of the Commissioners of NYS DEC and CT DEP, and Regional Administrators of EPA region 1 and 2, met once again in 2006 to sign a new MOU and establish updated goals for the Habitat Restoration Initiative. Many of the same partners who signed the 2000 MOU renewed their commitment this year to promote coastal habitat restoration, and a few new organizations also joined the partnership. Under the terms of the 2006 MOU, the partners resolve to:

- Work together to restore or protect an additional 300 acres of coastal habitat and open up an additional 50 miles of riverine migratory corridor to diadromous fish from January 1, 2006 to December 31, 2011, as stated in EPA's Strategic Plan, and ultimately restore 2,000 acres by 2020;
- Use partnerships to accomplish restoration objectives and leverage limited local, state, and federal funds.

The 2006 MOU can be viewed online at:
http://www.longislandsoundstudy.net/committees/Habitat_MOU06.pdf.
The 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).

2008 PROGRESS REPORT

Although the ultimate goal of habitat restoration is the implementation of projects, it can take several years of planning, design, obtaining permits and applying for grant funds before a project is ready for construction. For this reason, restoration acreages can vary considerably from year to year, and acreage alone is not a true measure of progress in the field of habitat restoration. Progress is reported by major habitat types with emphasis placed on completed projects. An introduction to each section is provided to summarize the overall work effort.

In calendar year 2008, progress was made toward the restoration goals with one very important goal being met this year. Five coastal habitat restoration projects were completed, totaling 16.1 acres in 2008 Three riverine migratory corridor projects were completed which now provide access to an additional 2.92 miles of migratory passageways for fish. By the end of 2008, 146 miles of riverine migratory corridor were opened to fish passage. Additional progress was made in other areas such as securing funding, initiating engineering design, and conducting preliminary tidal studies on other on-going projects.

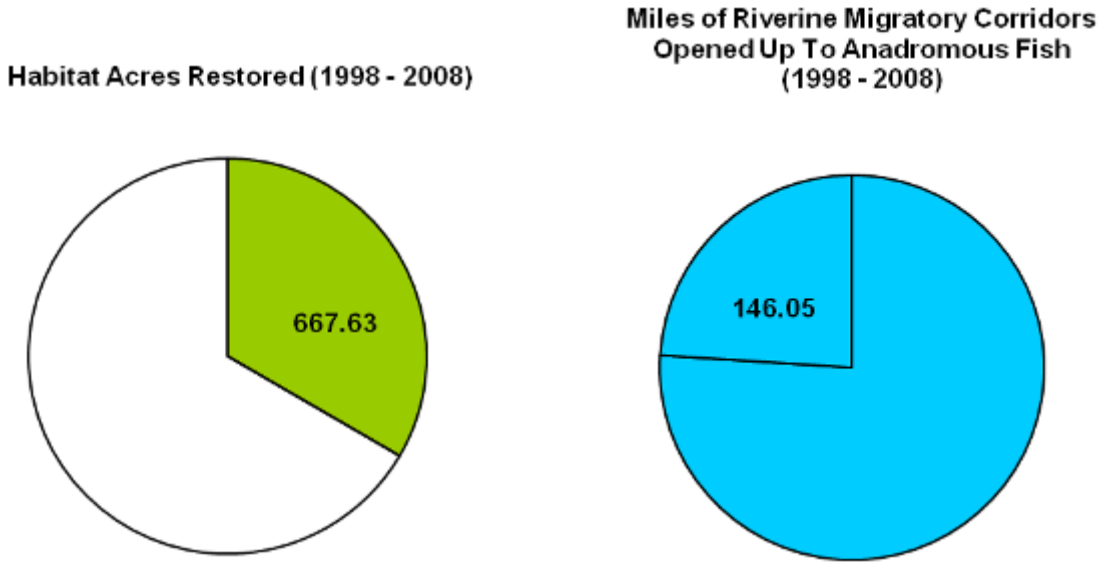

FIGURE 1. Acres and miles restored relative to HRI goals – we are currently at 33.4% and 146.05% of the goals of 2000 acres of coastal habitats and 100 river miles, respectively.

Other miscellaneous highlights include:

- The fourth round of awards from the Long Island Sound Futures Fund was made in 2008 and included funding for tidal wetland and eelgrass projects.

The following sections summarize restoration projects completed in 2008 by the states of Connecticut and New York. The habitat types included are tidal wetlands, riverine migratory corridors, submerged aquatic vegetation, coastal grassland, and coastal forest.

TIDAL WETLAND RESTORATION

Three tidal wetland restoration projects were completed in 2008 for a total of 11.95 acres restored and will be further discussed in the following section. Completed tidal wetland project acreage for 1998–2008 is presented in Figure 2. One of these projects is strictly *Phragmites australis* control and does not count toward LISS habitat restoration goals.

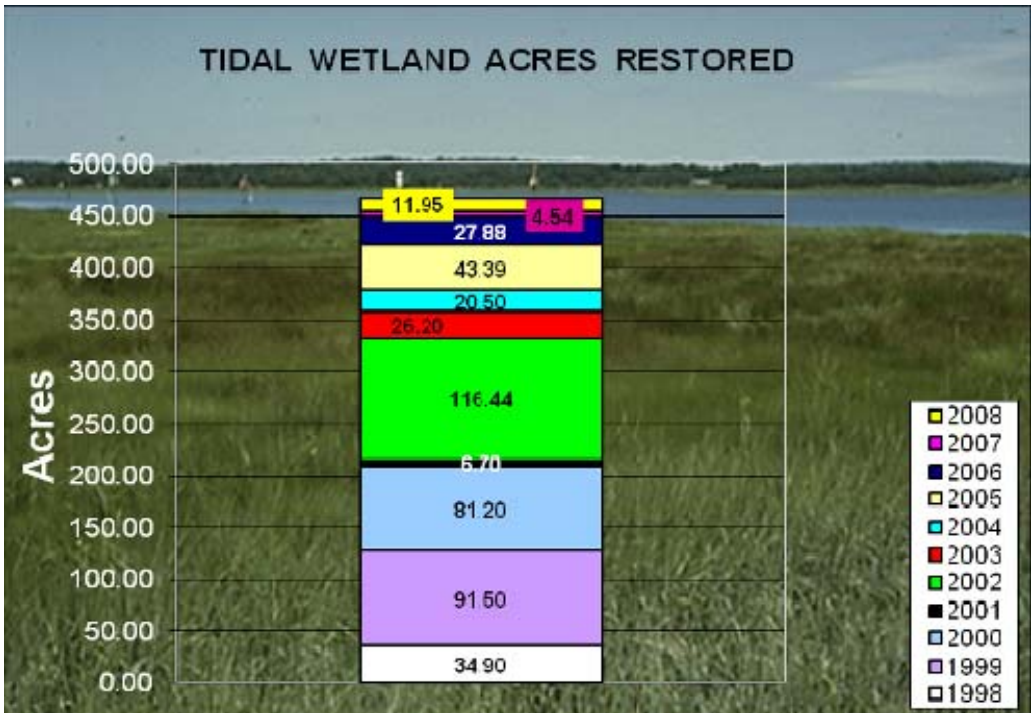

FIGURE 2. Acres of tidal wetlands restored (465.203 acres) between 1998 and 2008.

Many other projects were in various stages of development. Connecticut's 2008 habitat restoration workplan contained 32 tidal wetland projects, including 18 *Phragmites australis* control efforts (see discussion on the following page). Some of the highlights include:

- **Bride Brook:** Final design plans are 99% ready for the restoration of the mouth of Bride Brook, within Rocky Neck State Park in Niantic, CT. This project has a large tidal wetland component, a critical alewife RMC component, and a dune restoration component. Construction will begin in summer 2009.
- **Leetes Island:** CT DEP has sent a letter to the CT Corporate Wetlands Restoration Partnership, requesting *pro bono* design services for the restoration of Leetes Island Tidal Marsh in Guilford, CT.
- **Fivemile River:** Monitoring at Five Mile River marsh in Darien, CT has ceased; the coir logs are filling in with sediment, but very slowly, and they are beginning to decompose. It has been determined that a larger-scale project using coir logs to restore the subsiding tidal marsh here would be unsuccessful.
- **Little River:** Ducks Unlimited is preparing a grant application to the Long Island Sound Futures Fund for the restoration of the Little River tidal marsh system in New Haven, CT.

Phragmites australis Control and Evaluation of Restoration Techniques

Please see the 2005 report for previous information. The final update to the Lower Connecticut River *Phragmites* Control project is below.

By 2006, four years after the last round of herbicide treatments, the once *Phragmites*-dominated study sites had returned to what typical brackish and tidal fresh marshes look like in this area. An analysis of the vegetation at these sites indicates an increase in plant species diversity with decreasing salinity – a trend that

is typical of healthy tidal marshes along a salinity gradient. Only one of the study sites was an exception to this, with cattail-dominated marsh establishing itself after the *Phragmites* was eliminated.

A pattern in the recovery of *Phragmites* was also noted. In two of the oligohaline sites, the frequency increase of *Phragmites* between 2003 and 2006 was greater in the Meadow sites than in sites where tidal ponds were excavated and mosquito ditches were plugged (Ponds & Plugs sites). At one of the mesohaline sites, *Phragmites* frequency also increased considerably in Meadow transects (~45% to ~70%) but actually declined slightly in Ponds & Plugs treatment areas (~30% to ~25%). Over the short term, this decline can be attributed to increased hydroperiod and volume of standing water at the oligohaline Ponds & Plugs sites. This is also true for the mesohaline Pongs & Plugs sites, but the higher salinity at this site is also playing an important role in *Phragmites* control. Frequency of the invasive *Lythrum salicaria* (purple loosestrife) also increased more in Ponds & Plugs treatment areas than in Meadow treatment areas (in oligohaline areas only).

Breder Trap Sampling: Ninety five percent of all captured fish were taken from the 12 traps in three of the treatment areas (areas A, D, and E), while the Smith Neck reference sites disproportionately captured grass shrimp (*Palaemonetes pugio*); marsh amphipods (*Orchestia grillus*) and hydrobiid snails were over-represented at *Typha*–dominated sites in area A.

Litter Bag Invertebrate Sampling: Litter bag sampling of invertebrates yielded generally lower numbers of all taxa in 2006 than in 2003. Total numbers and frequencies of animals captured for most taxa tended to be greater from Meadow sites than Ponds & Plugs sites in both years, but differences were not significant

Surface Elevation Tables Installation and Monitoring in Long Island Sound

During Fall 2008 NYS DEC worked with The Nature Conservancy and New York City Department of Parks & Recreation to install a network of SET's throughout the Long Island and New York metropolitan area. The Long Island Sound locations are in the table below.

Table 1. List of all installed SET locations in Connecticut and New York through December 2008.

LOCATION	TOWN	STATE	INSTALLED	PARTNER
Barn Island Tidal Marshes	Stonington	CT	2002	Connecticut College
Mamacoke Island Tidal Marsh	Waterford	CT	2002	Connecticut College
Hoadley Creek Tidal Marsh	Guilford	CT	Oct-2004	Yale University
Jarvis Creek Tidal Marsh	Branford	CT	Oct-2004	Yale University
Sherwood Island State Park	Westport	CT	Oct-2004	Yale University
Great Meadows	Stratford	CT	Aug-2005	CTDEP/USGS
Quinnipiac River Wildlife Mgt Area	Hamden & North Haven	CT	Oct-2006	Yale University
East Creek	Sands Point	NY	Oct-08	NYSDEC
Flax Pond	Old Field	NY	Oct-08	NYSDEC
Frost Creek	Lattingtown	NY	Oct-08	NYSDEC
Pelham Bay Park	Bronx	NY	Oct-08	NYSDEC/NYC P&R
Udalls Cove	Great Neck	NY	Nov-08	NYSDEC/NYC P&R
West Pond	Glen Cove	NY	Nov-08	NYSDEC

Please see the 2005 annual report for previous information regarding SETs in Connecticut and New York.

OLD FIELD CREEK TIDAL MARSH RESTORATION

State: Connecticut
Town: West Haven
Habitat Type: Tidal Wetland
Acres Restored: 11.7

Cause of Degradation: Degradation of the tidal marsh system at Old Field Creek began in 1917 when the wetlands were ditched for mosquito control. A pair of tide gates was also mounted to the twin 30-inch diameter culverts under Beach Street to prevent tidal waters from entering, and to allow the system to remain drained. Incidentally, these culverts were not installed properly – they were placed too high to fully drain the marsh at low tide.

This newly created tidal restriction resulted in several problems. With the tide gates essentially preventing water from entering the system during the flood tide, there was very little head pressure from the water trickling out at low tide. The outlet of this system crossed a sandy beach and without the scour-power of the full volume of tidal water draining at low tide, sand would frequently build up in front of and plug the drainage channel. This led to residential flooding problems during times of heavy rain - the stormwater could not drain out of the system with the culverts plugged with sand. Even when the pipes were clear and water was flowing, the fact that the pipes were installed too high caused water to remain trapped in the system and led to an increase in mosquito breeding. The invasive weed *Phragmites australis* (common reed) also was able to invade and out-compete the native tidal marsh grasses. The salty New Haven Harbor water could no longer enter the marsh, which converted the system to a very low salinity tidal marsh – creating ideal conditions for *Phragmites australis* to thrive.

The tide gates leaked, allowing some tidal water to enter the system, but not enough to keep the marsh healthy, or to prevent the sand from building up at the outlet. To prevent the drifting beach sand from being deposited in front of the culverts, the City constructed a pair of training walls in the early 1960s to deflect the sand. Unfortunately, this led to a series of other problems. The training walls acted like any groin would in a sandy beach environment, and due to the direction of longshore drift, all of the sand was being deposited on the south side of the training walls. The walls trapped sand and a new sandy spit was forming offshore of Morse Park – aptly named Morse Point. This growing spit increasingly reduced the amount of sand reaching and getting deposited on Sandy Point. Morse Point has been steadily growing in size, while Sandy Point has been slowly eroding away ever since.

Project Description: Nothing reasonably canbe done to correct or reverse the impacts of the mosquito ditches at this or any other mosquito-ditched tidal marsh, but the tidal restriction and *Phragmites* problem were fixable. The existing tide gates were removed, and the twin 30-inch culverts were replaced with a 4-foot by 8-foot concrete box culvert. Installed at the proper elevation, the new opening was sized large enough to properly drain the marsh at low tide, and could handle large pulses of storm water. In order to prevent upstream residential properties from flooding at high tide, a pair of self-regulating tide gates (SRTGs) were mounted to the downstream end of the box culvert. The SRTGs remain in the open position allowing tidal water in and out of the system freely, but they are designed to close once the tidal water reaches a pre-determined height. They will open again once the tide falls below that level. They can also be adjusted to act like the previous tide gates (one-way flap gates for drainage only) in the event of a storm. The reintroduction of salt water will improve the overall health of the system, and will help to push the *Phragmites* back to the upland edge of the marsh.

Around the time this project was ready to go to construction, it was noted that the narrow opening of the lagoon which had formed between Morse Point and Sandy Point was closing. Morse Point had finally grown long enough to fully connect to Sandy Point, which lies on top of the City's sewage treatment plant outflow pipe. A new opening is trying to form across Sandy Point (about midway down its length), but the outflow

pipe greatly restricts tidal flow. Tidal flow between the lagoon and New Haven Harbor has been reduced, and this area will likely need more restoration work in the near future.

Implementation Partners: Connecticut Department of Environmental Protection - Office of Long Island Sound Programs (lead), and Wildlife Division; City of West Haven; Connecticut Department of Transportation; US Environmental Protection Agency - Long Island Sound Office

Funding Provided By: Connecticut Department of Transportation – Intermodal Surface Transportation Efficiency Act (ISTEA) program; Connecticut Department of Environmental Protection – Long Island Sound Clean-up Account; City of West Haven.

CHRISHOLM MARINA TIDAL WETLAND RESTORATION

State: Connecticut
Town: Chester
Habitat Type: Tidal Wetland
Acres Restored: 0.25 acres of tidal wetlands

Cause of Degradation: A marina was built along the shore of the Connecticut River in Chester during the 1960s. Construction included dredging a section of tidal wetland to create the marina basin, and the sediments were disposed of in the adjacent marshy areas. Some of this filled marsh was developed for buildings, parking, and other uses, while other areas were simply converted to lawn.

Project Description: The fill was removed from a 0.25-acre section of lawn to restore the freshwater tidal wetlands buried below. This area was contiguous to another area of tidal marsh that was never filled, and therefore became tidally connected as soon as the target elevation was met. The restored marsh has since completely re-vegetated on its own, with the help of tidal waters delivering seeds, and through vegetative growth of adjacent wetland plants. Currently, the dominant plant is northern arrowhead (*Sagittaria latifolia*) but there are at least 14 other species present, including only one non-native invasive weed - purple loosestrife (*Lythrum salicaria* L.).

Funding Provided By:
Chrisholm Marina

Photographs of the fresh water tidal marsh restored at Chrisholm Marina, looking northeast (top) and southwest. Photos taken by Rich Snarski.

TURKEY HILL BROOK PHRAGMITES CONTROL

State: Connecticut
Town: Milford
Habitat Type: Tidal Wetland
Acres Restored: 14 acres; *Phragmites austalis* control does not count toward LISS habitat restoration goals

Cause of Degradation: A dense monoculture stand of *Phragmites australis* has taken over a section of oligohaline - fresh tidal marsh in the Charles E. Wheeler Wildlife Area, along the east bank of the Housatonic River in Milford, CT.

Project Description: *Phragmites* control in a borderline oligohaline/fresh tidal marsh, utilizing the herbicide Habitat. Mature *Phragmites* stems (with seed heads) were sprayed with Habitat® in late summer, and then the standing dead stems were mulched over the winter months. This helps to increase the amount of sunlight reaching the marsh surface, promoting the germination of the seeds of native marsh plants. The herbicide and mulching treatments were done for three consecutive years to kill regrowth of *Phragmites*, and the effort was significantly reduced with each subsequent treatment.

Implementation Partners: Connecticut Department of Environmental Protection - Wildlife Division.

Funding Provided By: Connecticut Department of Transportation.

Aerial view of Turkey Hill Creek and tidal marsh system in the Housatonic River, facing northeast, prior to *Phragmites* control efforts.

RIVERINE MIGRATORY CORRIDOR RESTORATION

The Connecticut Riverine Migratory Corridor (RMC) team, led by the CTDEP Inland Fisheries Division, completed four migratory fish passage projects resulting in 35.82 additional river miles now accessible to anadromous finfish. Project summary pages follow.

The 10-year goal (1998 - 2008) for this habitat type is to open up 100 currently inaccessible river miles to diadromous fish. Due to success in reaching the goal, the 2006 MOU added an extra 50 miles to the HRI goal to be reopened to migratory fish passage by 2011. To date, 142.52 river miles have been restored through fish passage projects such as dam modifications or dam removal. River mileage for projects completed in 1998–2008 is presented in Figure 3.

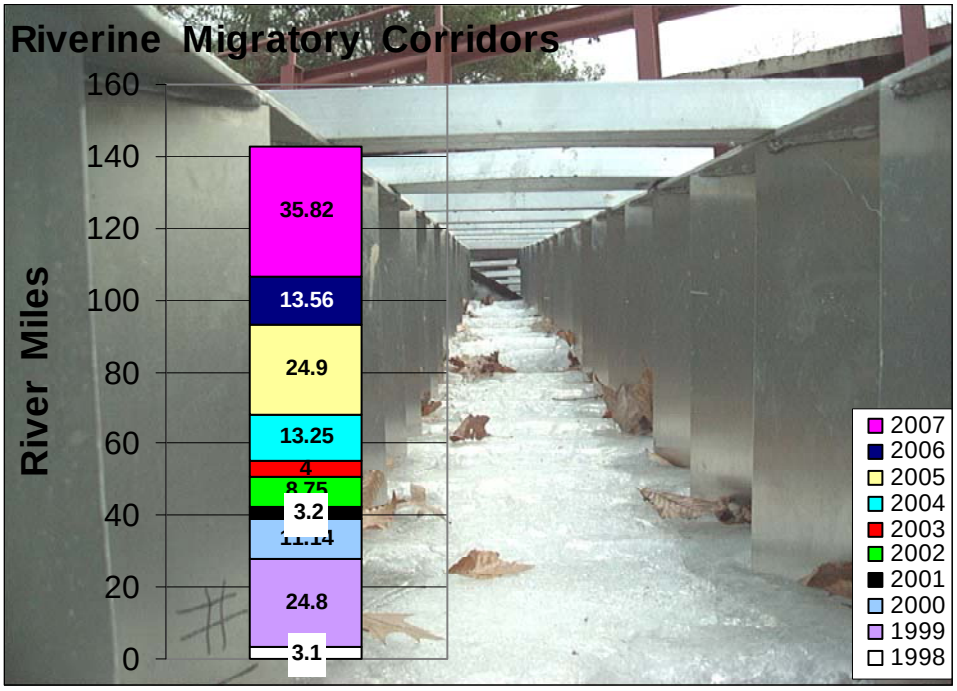

FIGURE 3. Cumulative river mileage (146.05 miles) for RMC projects completed between 1998–2008.

Connecticut's RMC team also worked on 28 other projects that were in various stages of development. Highlights of progress for both states include:

- In 2007 and 2008 the Long Island Chapter of Trout Unlimited surveyed the Oyster Bay and Cold Spring Harbor Watershed to complete a watershed assessment of fish passage barriers. This project was funded through the Long Island Sound Futures Fund.
- **StanChem Dam:** A proposed fishway at StanChem Dam on the Mattabesset River in Berlin, CT, is fully designed and is expected to go to construction in 2009.
- **Mill River/Main Street Dam:** CT DEP – Office of Long Island Sound Programs issued a permit for the removal of the Main Street Dam on the Mill River (aka Rippowam River) in Stamford, CT. The project is now fully funded and ready to go to construction in early 2009.
- Tingue Dam: A $4,000,000+/- project which would allow fish to bypass Tingue Dam on the Naugatuck River in Seymour, CT, remains on hold. The project is fully designed and ready to go forward but is short on funds. CTDEP may have the option to apply for federal stimulus funds for this project early in 2009.

Ring's End Dam Fishway

State: Connecticut
Town: Darien
Habitat Type: Riverine Migratory Corridor
Stream Name: Goodwives River
Miles Restored: 0.8 miles

Cause of Degradation: A dam in the Goodwives River in Darien, CT blocks the passage of anadromous fish.

Project Description: A steep-pass fishway was installed on the 7'-tall dam to allow the passage of migratory fish. Fish passage was provided as a condition of a dam-repair permit issues by CTDEP.

Targeted Fish Species: alewife, blueback herring, sea-run brown trout

Implementation Partners: Town of Darien (lead); Connecticut Department of Environmental Protection - Inland Fisheries Division

Funding Provided By: Town of Darien

Photo courtesy of Darren Oustafine, Darien Public Works.

Photo courtesy of Darren Oustafine, Darien Public Works.

Grossman Dam Fishway

State: Connecticut
Town: Westport
Habitat Type: Riverine Migratory Corridor
Stream Name: Aspetuck River (1st dam)
Miles Restored: 0.62 miles

Cause of Degradation: A privately owned, low-head (~2.5' high) dam in the Aspetuck River prevented migratory and resident fish from moving freely up and downstream.

Project Description: A pool and weir fishway was designed (by Curt Orvis, US Fish & Wildlife Service) and built on site during the fall of 2008. This 15' long fishway with 3 pools and a 3' interior width will allow fish access to an additional half mile + of stream habitat to the base of an unnamed and unregistered dam upstream. The fishway was built with stone and concrete for aesthetic purposes.

Targeted Fish Species: alewife, blueback herring, sea lamprey, and sea-run brown trout.

Implementation Partners: The Nature Conservancy (lead); Connecticut Department of Environmental Protection – Inland Fisheries Division; property owner; Trout Unlimited; and other conservation partners involved with the Saugatuck River Watershed Partnership.

Funding Provided By: National Fish and Wildlife Foundation through the Long Island Sound Futures Fund (design and construction), with match provided by The Nature Conservancy and assistance from the Connecticut Department of Environmental Protection , Inland Fisheries Division.

Grossman Dam before (top) and after fishway construction (above). Photos courtesy of Sally Harold.

LOW DAM FISHWAY

State: Connecticut
Town: Weston
Habitat Type: Riverine Migratory Corridor
Stream Name: Saugatuck River (5th dam)
Miles Restored: 1.5 miles

Cause of Degradation: A privately owned, low-head (approximately 3' high) dam in the Saugatuck River prevented migratory and resident fish from freely moving up and downstream.

Project Description: A pool and weir fishway was designed and built on site during the fall of 2008. This 37-foot long fishway with a 4 foot interior width and a slope of 1:10 will allow fish to access an additional 1.5 miles of stream habitat to the base of Hasen Pond Dam in Weston, CT. The fishway was built with stone and concrete for aesthetic purposes.

Targeted Fish Species: alewife, blueback herring, sea lamprey, and sea-run brown trout.

Implementation Partners: The Nature Conservancy (lead); Connecticut Department of Environmental Protection – Inland Fisheries Division, property owner; Trout Unlimited; and other conservation partners involved with the Saugatuck River Watershed Partnership.

Funding Provided By: National Fish and Wildlife Foundation through the Long Island Sound Futures Fund (design & construction), with match provided by The Nature Conservancy and assistance from the Connecticut Department of Environmental Protection – Inland Fisheries Division.

Low Dam before (top) and after fishway construction (above). Photos courtesy of Sally Harold.

SUBMERGED AQUATIC VEGETATION (SAV)

Eelgrass

On July 26, 2006, the NYS Legislature established the New York State Seagrass Task Force chaired by the NYS Department of Environmental Conservation. This Task Force is an assembly of voting and non-voting members representing state agencies, recreational and commercial fishing and boating industries, estuary programs, academia, municipalities, and nonprofit entities. The NYS Seagrass Task Force, charged with developing recommendations to restore, research, preserve, and manage seagrass, has invested significant resources into researching, monitoring and analyzing seagrass threats, impacts, trends and data. The recommendations in the draft report are intended to serve as a blueprint for efforts to protect and restore NY seagrasses. A final report of recommendations is due to the NYS Governor and Legislature by the end of 2009.

One of the HRI priorities is updating the eelgrass inventory every 3 years, Because of poor weather conditions the USFWS eelgrass survey flight that was scheduled for Summer 2008 will be flown in 2009.

TERRY'S POINT EELGRASS MEADOW

State: New York
Town: Southold
Habitat Type: Tidal Wetland
Acres Restored: 3/4 acres of eelgrass

Cause of Degradation: After the 1930's eelgrass die-off, New York's Long Island Sound eelgrass did not recover to its previous extent..

Project Description: Cornell Cooperative Extension (CCE) researchers developed a rock transplant method to encourage successful establishment of eelgrass shoots. Donor meadows included Mulford Pt., Fishers Island and Orient Point. The site was chosen due to geographic similarities to Mulford Pt. a natural meadow that also served as a reference meadow. Test plantings were undertaken in 2005; more intensive plantings followed in 2006 through 2008. The plantings have successfully expanded to densities exceeding those found in natural beds.

Implementation Partners: Cornell Cooperative Extension of Suffolk County, National Fish and Wildlife Foundation, Save the Sound, Southold Town Trustees.

Funding Provided By: National Fish and Wildlife Foundation, Save the Sound

Eelgrass meadow off of Terry's Pt. in Southold. Photo courtesy of CCE.

Water Chestnut Removal

No updates to water chestnut removal effort are available as this task has been reassigned to a different division with CTDEP.

Water Chestnut Expansion

Five new water chestnut populations were discovered in 2008. Two were in Connecticut and three were in NY, including one on Long Island that is within the LISS Project Boundary. Please see the 2005 report for previous information on water chestnut in this area.

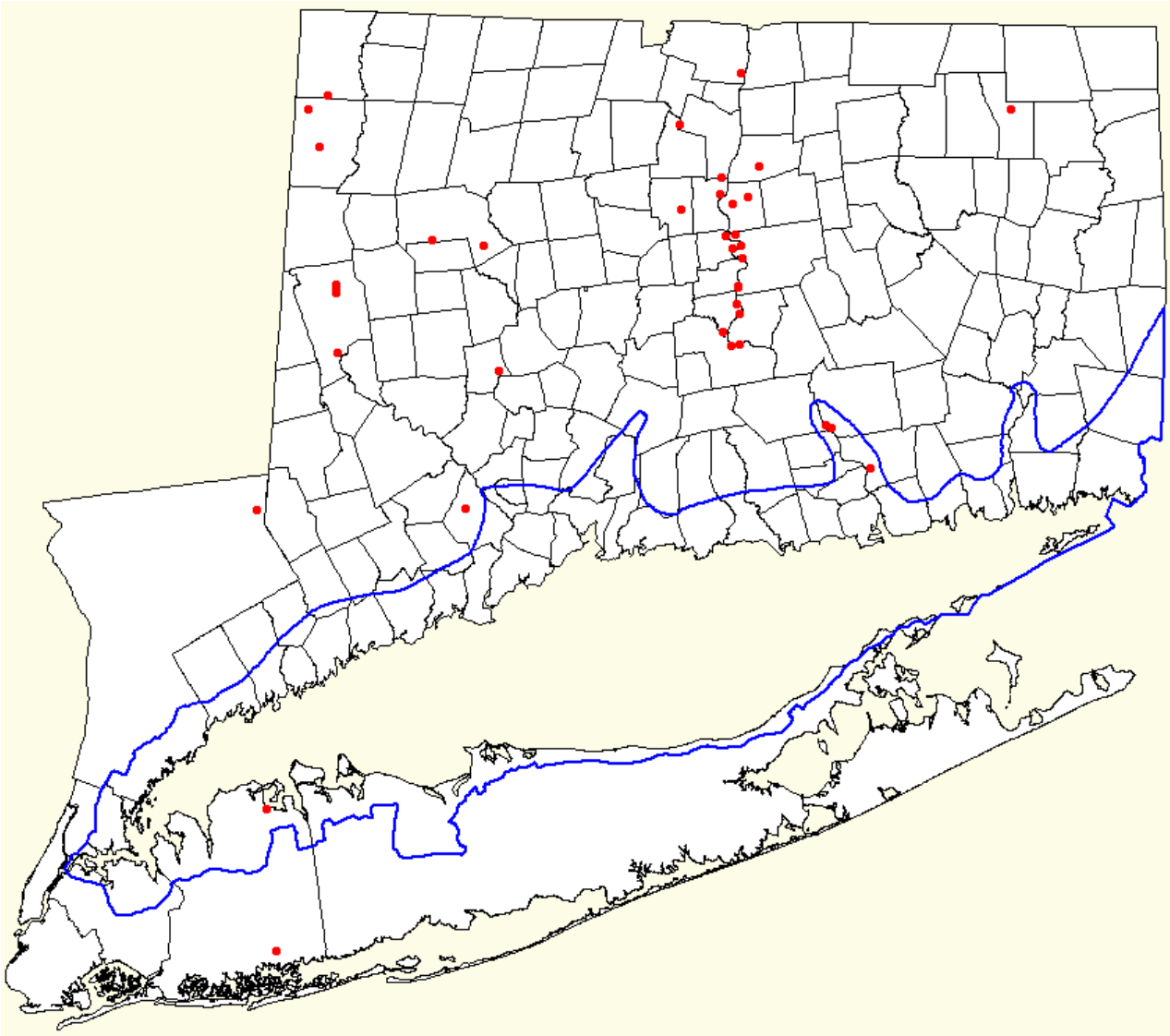

Figure 4. Known distribution of water chestnut populations, (red dots), in Connecticut and New York (LIS region only) as of December 2008. To date, four water chestnut populations are known to reside within the Long Island Sound Study Project Boundary (blue line).

COASTAL GRASSLAND

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.

In Connecticut one project was completed that restored 2.5 acres of grassland.

LYNDE POINT LIATRIS MEADOW RESTORATION

State: Connecticut
Town: Old Saybrook
Habitat Type: Coastal Grassland
Acres Restored: 2.5

Cause of Degradation: New England Blazing Star (*Liatris scariosa var. novae-angliae*), is a state-listed rare plant occurring in sand plains and other sandy, well-drained coastal habitats. The species occurs in a 2.5-acre coastal meadow in Old Saybrook, CT, owned by the Borough of Fenwick and managed by the Lynde Point Land Trust (LPLT). In spite of annual mowing, the meadow was rapidly filling in with shrubs. The blazing star population began to decline due to a combination of factors, including early growing season mowing, plant and flower collection, browsing by herbivorous animals (including rabbits and deer), and competition with encroaching shrubs.

Project Description: The goal of this project was to restore and maintain a coastal meadow that supports a relatively large population of New England Blazing Star (*Liatris scariosa var. novae-angliae*), an aster currently listed as Special Concern in CT, and which is classified as a rare plant throughout the New England region. A fence was erected and deer repellant was applied to reduce grazing. Several species of shrubs, including winged sumac (*Rhus copallinum*) and choke cherry (*Prunus virginiana*) were treated with herbicide. Although these plants are native, they are very common - even a nuisance in some areas - and their ability to spread rapidly was a threat to the rare blazing star. Annual herbicide application and mowing will continue to help keep these shrubs in check. Goldenrods (*Solidago spp.*) and deer tongue (*Dichanthelium clandestinum*) were added to the herbicide list after the first two years of treatment. Methods to control browsing by eastern cottontail rabbits will also be researched to minimize their impacts as well. For more information, see: Barrett, J., N. Barrett, C. Chadwick, and S. Prisloe. 2008. Management for *Liatris scariosa var. novae-angliae* in a coastal meadow in southeastern Connecticut. (abstract) Long Island Sound Research Symposium. October 30-31. New London, CT.

Implementation Partners: Borough of Fenwick; Lynde Point Land Trust; US Department of Agriculture - Natural Resources Conservation Service

Funding Provided By: Natural Resources Conservation Service - Wildlife Habitat Incentives Program; Lynde Point Land Trust (in-kind)

COASTAL FOREST

At this time, the Technical Support for Coastal Habitat Restoration manual does not include a finalized chapter to summarize the key elements of coastal forest restoration. A draft chapter, however, is in the early stages of development.

In New York, one coastal forest restoration project was completed during 2005, for a total of 5 acres restored. Several other projects were in various stages of development.

No coastal forest restoration projects were completed in Connecticut. The State of Connecticut currently has no program dedicated specifically to the restoration of coastal forest habitat.
The following freshwater wetland restoration project was completed in 2008:

• *Edith G. Read* Natural Park and Wildlife Sanctuary coastal forest restoration, Rye, NY 0.9 acres of coastal forest

EDITH G. READ SANCTUARY FOREST RESTORATION

State: New York
Town: Rye
Habitat Type: Forest
Acres Restored: 0.9

Cause of Degradation: Edith G. Read Sanctuary has a history of various human disturbances. The Park was once home to a greenhouse, which in addition to spread of invasives through more natural means (birds, wind) served as a source of non-natives that would come to dominate the landscape. The parcel previously had been the site of an old amphitheater and become completely overgrown with invasive species, such as porcelain berry (*Ampelopsis brevipedunculata*), Japanese knotweed (*Polygonum cuspidatum*) and honeysuckle bush.

Project Description: The site was cleared of the remnant debris left over from an old amphitheater and physical and chemical methods were used to clear the parcel of invasive. Native plants, including red maple (*Acer rubrum*), post oak (*Quercus stellata*), black oak (*Quercus velutina*), and bayberry (*Myrica pensylvanica*) were planted in a random pattern after the site was cleared and graded to more closely mimic that of a natural forested area. Deer fencing was utilized to prevent excessive deer browsing of restoration site.

Implementation Partners: Friends of Read Wildlife Sanctuary, Inc, The Little Garden Club of Rye, Westchester County Department of Parks, Restoration and Conservation

Funding Provided By: Friends of Read Wildlife Sanctuary, Inc; National Fish and Wildlife Foundation - Long Island Sound Futures Fund Program; Westchester County Government

Above: Young trees were planted in a random pattern and native plants were used to create a natural understory. Picture provided by NYS DEC.