LONG ISLAND SOUND STUDY

HABITAT RESTORATION INITIATIVE

ANNUAL SUMMARY FOR THE YEAR 2009

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ANNUAL SUMMARY FOR THE YEAR 2009

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Cover photo: Tidal wetland plantings in Manursing Lake, Rye, NY. Photo by Heather Young, NYS DEC

LONG ISLAND SOUND STUDY
HABITAT RESTORATION INITIATIVE
Annual Summary for the Year 2009
BACKGROUND

This report summarizes the accomplishments of the Long Island Sound Study's (LISS) Habitat Restoration Initiative (HRI) for year 2009, 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 (SAV), 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. For more information on the habitat restoration initiative, go to: http:/longislandsoundstudy.net/issues-actions/habitat-quality/background/.

The Policy Committee, comprised of the Commissioners of NYS DEC and CT DEP, and Regional Administrators of EPA Regions 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 that 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://longislandsoundstudy.net/wp-content/uploads/2010/03/Habitat_MOU06.pdf .

The Long Island Sound Study plays a major role in habitat restoration by providing annual funding to the New York State 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).

2009 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 2009, progress was made toward the restoration goal. Five coastal habitat restoration projects were completed, totaling 156.8 acres in 2009 Four riverine migratory corridor projects were completed which now provide access to an additional 8.5 miles of migratory passageways for fish. By the end of 2009, a total of 154 miles of riverine migratory corridor had been opened to migratory 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. All targets set by the Long Island Sound Study for riverine migratory corridors have been exceeded.

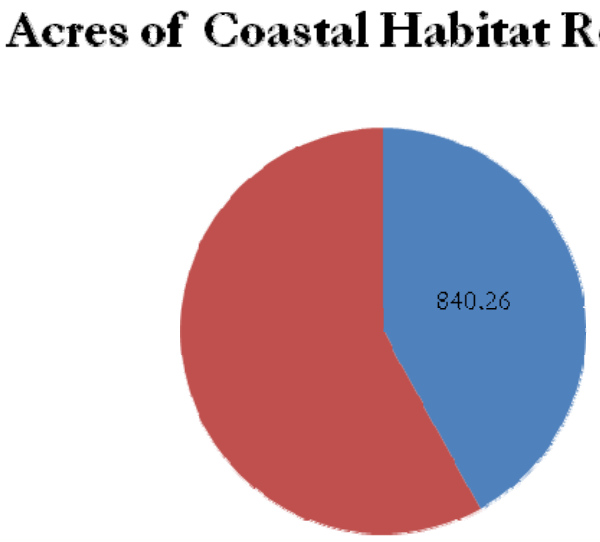

FIGURE 1. Acres restored relative to HRI goals, currently at 42% of the goal of 2000 acres of coastal habitats.

The following sections summarize restoration projects completed in 2009 by the states of Connecticut and New York. The habitat types included are tidal wetlands, riverine migratory corridors, and coastal forest. Additional details, including links to maps and pictures can be found in our habitat restoration database (http://lisshabitatrestoration.com/search.aspx).

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TIDAL WETLAND RESTORATION

Two tidal wetland restoration projects were completed in 2009 for a total of 5 acres restored. These projects will be discussed further in the following section. Completed tidal wetland project acreage for 1998–2009 is presented in Figure 2.

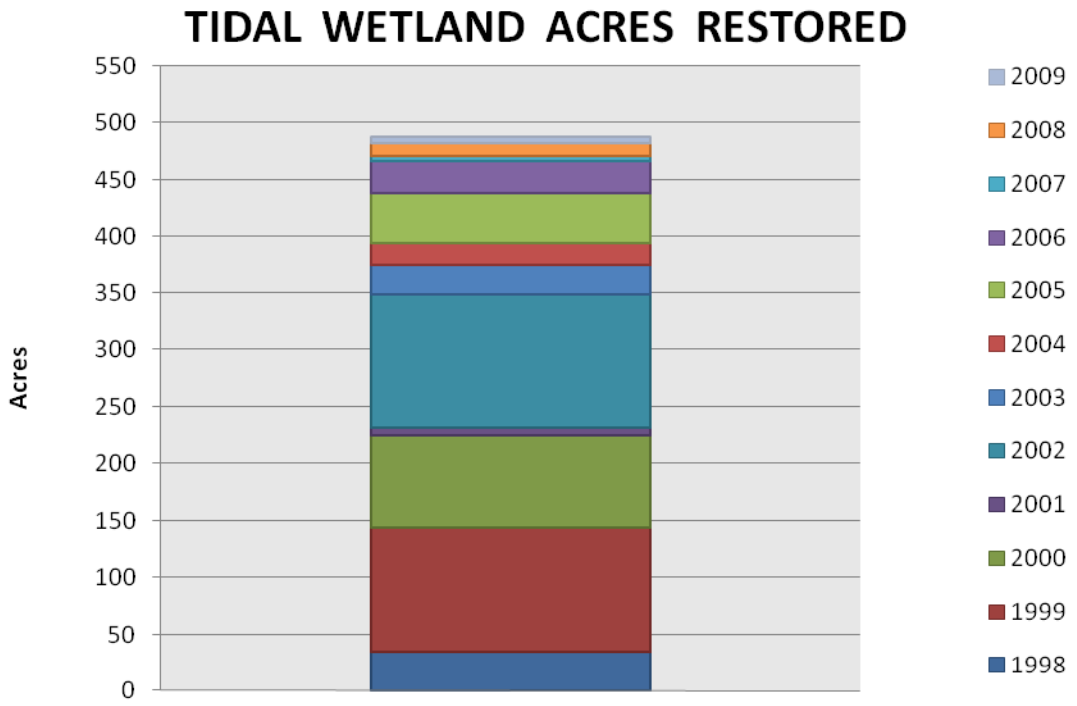


FIGURE 2. Acres of tidal wetlands restored (486.703 acres) between 1998 and 2009.

Estuarine embayment projects are included under the tidal wetland heading for this annual report. Embayments may feature many of our habitat types, including SAV, tidal wetlands, shellfish reefs and intertidal flats. For the two estuarine embayment restoration projects completed in 2009, tidal wetlands comprise significant features of the project and are included under the tidal wetlands heading.

Mill River Dam Removal

State: Connecticut

Town: Stamford

Habitat Type: Tidal Wetland, Freshwater Wetland, Estuarine Embayment, Riverine Migratory Corridor

Acres Restored: 18.1

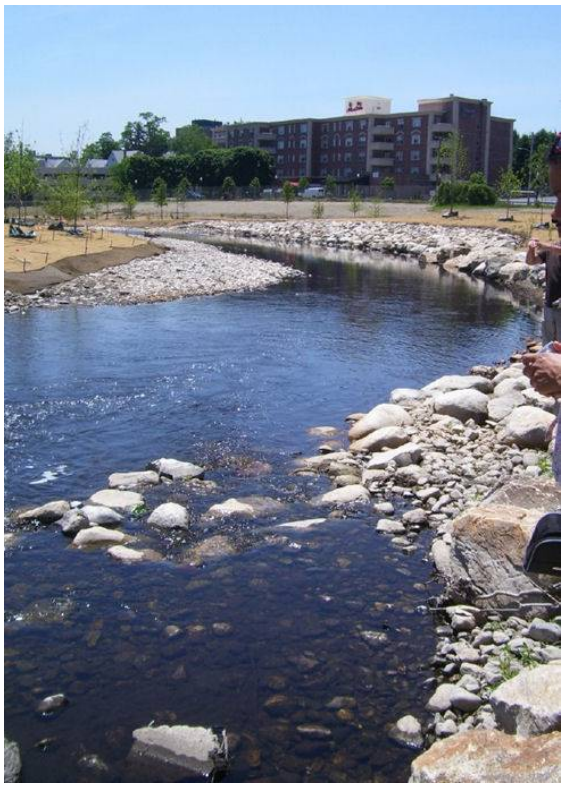
Miles Opened: 6.6

Cause of Degradation: A 10-foot high tidal dam in the Mill River blocked the passage of diadromous fish to historic spawning grounds. The dam also prevented tidal waters from flowing upstream to the extent that it had flowed historically. A 1500-foot stretch of river immediately upstream and downstream of the dam was channelized and contained by concrete walls providing minimal habitat value.

Project Description: The dam was removed and tidal flow was restored. The concrete-lined channel was also rehabilitated, resulting in the restoration of tidal wetland and estuarine embayment habitat. Fish passage was also restored to 6.6 miles of migratory corridor in the Mill River. This project re-connected tributaries, and restored non-tidal freshwater wetlands.

Implementation Partners: City of Stamford, Mill River Collaborative, US Army Corps of Engineers

Funding Provided By: City of Stamford, Army Corps of Engineers, Open Rivers Initiative



Looking downstream toward location of the former dam. The concrete-lined channel has been replaced with stone and vegetation, including a series of riffles and plunge pools in the river. Photo by Kristen Bellantuono, CT DEP.

Camp Harkness Tidal Marsh

State: Connecticut

Town: Waterford

Habitat Type: Tidal Wetland

Acres Restored: 4.2

Cause of Degradation: Insufficient tidal flow through a culvert under one of the Camp's roads led to dense stands of tall *Phragmites australis* in this 4.2-acre tidal marsh.

Project Description: Tidal flow was restored first by clearing the existing culvert of debris. A ground penetrating radar survey was performed by staff from the US Department of Agriculture's Natural Resources Conservation Service in January 2004, looking for buried utilities under the road. Shortly thereafter it was determined that the tidal creek and mosquito ditch clearing work done just downstream and a few years earlier led to a slightly increased tidal flow up to, and through the pipe. No further work was needed except for some *Phragmites* control to speed up the return of native tidal marsh vegetation.

Funding Provided By: Connecticut Department of Environmental Protection - Wildlife Division

View across the Camp Harkness tidal marsh from an area already treated for Phragmites control. Live, untreated Phragmites can be seen in the background, while native marsh vegetation can be seen sprouting in the foreground. Photo courtesy CT DEP.

Manursing Lake

State: New York

Town: Rye

Habitat Type: Estuarine Embayment, Tidal Wetland

Acres Restored: 104 acres

Cause of Degradation: In the process of developing Playland Amusement Park, a tidal wetland was dredged, filled and impounded. To control water levels, two manually controlled tide gates had been installed. The resultant reduction in tidal flow decreased the habitat values that the wetland historically provided.

Project Description: Once an expansive salt marsh, the area now known as Manursing Lake was dredged and impounded in the 1920s during the development of Playland Amusement Park. After being impounded the newly formed lake received irregular flooding through manually controlled tide gates. This lack of tidal flow in the system has led to problems with anoxia and hypoxia and greatly reduced fish access to the system. After the re-introducing tidal flow through the installation of the two self regulating tide gates, tidal wetland plantings were done along a portion of the shoreline. *Spartina alterniflora* and *S. patens* were planted in the newly inter-tidal area and will serve as a seed source to expand the vegetation through other appropriate areas in the system. The shoreline to the south-east of the gate was re-graded to elevations that are suitable to supporting salt marsh plantings and at a grade to allow a limited amount salt marsh migration in the face of sea level rise in a portion of the planting area. Much of the land surrounding Manursing Lake is a forested nature preserve.

Implementation Partner: Westchester County

Funding Provided By: National Fish and Wildlife Foundation - Dissolved Oxygen Environmental Benefit Fund for the Western Long Island Sound and Jamaica Bay; New York State Clean Water Clean Air Bond Act; Westchester County Government

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Manursing Lake prior to tide gate installation. Notice the tall tree in the center of the picture for reference in image below. Picture taken by NYS DEC.

Installation of the tide gate allows the water level in Manursing Lake to regularly receive tidal exchange with the Sound. The shoreline has been regarded and the planting of native tidal wetland species will serve as a seed source throughout the embayment.. Picture taken by NYS DEC.

Mill Pond

State: New York

Town: Port Washington

Habitat Type: Estuarine Embayment, Tidal Wetland

Acres Restored: 6

Cause of Degradation: Originally known as Dodge's Inlet, Mill Pond was dammed in 1795 when a road was established along the shoreline. Later a mill was established at the site, from which the pond currently derives its name. Decades of stormwater runoff had accumulated in the system.

Project Description: Dredging of 10,000 cubic yards of sediment that had accumulated in the system from stormwater runoff increased the water depth and improved the water quality. The dam was modified to allow tidal flow from Manhasset Bay into the small embayment, allowing small fish to have access to the system. The new influx of tidal flow into the pond made the conditions were suitable for tidal wetland plantings along the shoreline.

Implementation Partners: Town of North Hempstead

Funding Provided by: Town of North Hempstead, Environmental Protection Agency

The dam on this small impoundment was reconfigured to allow tidal exchange with Manhasset Bay. Tidal wetland species were planted along the shoreline, allowing the system to provide the important ecological services of a tidal marsh for the first time in centuries. Picture taken by Heather Young, NYS DEC.

RIVERINE MIGRATORY CORRIDOR RESTORATION

The Connecticut Riverine Migratory Corridor (RMC) team, led by the CTDEP Inland Fisheries Division, completed three migratory fish passage projects resulting in 8.5 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, 154.6 river miles have been restored through fish passage projects such as dam modifications or dam removal. River mileage for projects completed in 1998–2009 is presented in Figure 3.

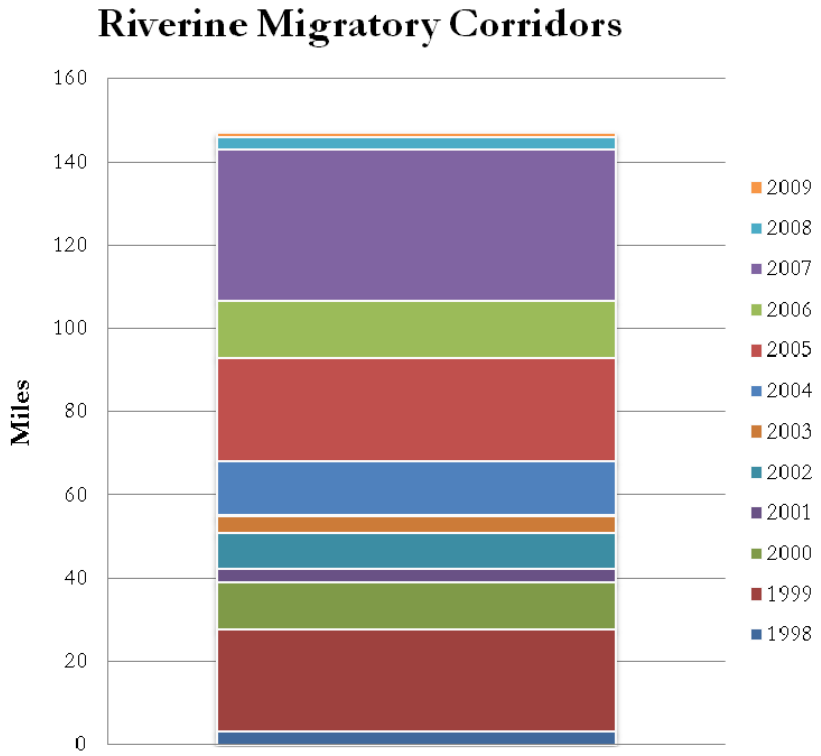

FIGURE 3. Cumulative river mileage (154.6 miles) for RMC projects completed between 1998–2009.

Vargas Pond Dam Fishway

State: Connecticut

Town: Stonington, CT

Habitat Type: Riverine Migratory Corridor

Stream Name: Vargas Pond Brook

Miles Restored: 0.7 miles

Cause of Degradation: A small, 18" high dam in Vargas Pond Brook blocked the passage of fish.

Project Description: A Denil Fishway was installed in the center of the dam to provide access for anadromous species of fish. This brook drains into the northwestern side of Stonington Harbor; the dam is just a few feet above the head of tide.

Targeted Fish Species: Alewife

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

Funding Provided By: Town of Stonington

View of Vargas Pond Dam before the fish ladder was installed. Photo provided by the Town of Stonington.

Denil fishway installed at Vargas Pond Dam. Photo provided by Steve Gephard, CT DEP

Crystal Lake Bypass Channel

State: Connecticut

Town: Old Saybrook

Habitat Type: Riverine Migratory Corridor

Stream Name: Fishing Brook

Miles Restored: 1.2 miles

Cause of Degradation: A 4 ft tall, low-hazard (class A) dam in Fishing Brook blocks the passage of fish.

Project Description: A bypass was constructed around Crystal Lake Dam. The channel has a gentle 1:30 slope and occupies a former emergency spillway channel.

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

Implementation Partners: Connecticut Department of Environmental Protection - Inland Fisheries Division, Natural Resources Conservation Service, Old Saybrook Land Trust, Town of Old Saybrook

Funding Provided By: Town of Old Saybrook

View of the bypass channel around Crystal Lake Dam. Photo courtesy CT DEP.

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 and is a priority chapter for HRI work group to pursue.

In New York, one coastal forest restoration project was completed during 2009, for a total of 23.5 acres restored.

Several other projects were in various stages of development.

Alley Pond Park Coastal Forest

State: New York

Town: Douglaston

Habitat Type: Forest

Acres Restored: 23.5

Cause of Degradation: The hydrologic conditions surrounding the headwaters of Alley Creek have been altered by the construction of major roadways and ensuing development pressures.

Project Description: The origin of Alley Creek is located in a steeply-sloped ravine, though the groundwater flows to sustain constant flow have been greatly reduced by drastic changes in the landscape during area development; with no base flow during dry periods and becomes flashy during storm events. The alterations to the surrounding environment have led to the project area experiencing intense flooding during rain events, causing sedimentation downstream due to erosion of the sloped areas. The landscape was dominated by invasive plants. Mechanical and chemical methods were used in the removal of the nuisance plants. Removing invasives from the headwaters area of Alley Creek is an important step in protecting the integrity of previous projects, as this area served as a seed source of invasive plants. In some cases, Norway maples were girdled, allowing wildlife to use the resulting cavities as nesting habitat. Along the streambank, erosion control fabric was planted with native herbaceous plugs. Native species were replanted by staff and volunteers throughout the project and included Red oak, black oak, pin oak, tulip poplar, sweetgum, silky dogwood and elderberry. Additional photos can be seen by linking from our database

Implementation Partners: GreenApple Corps

Funding Provided By*:* City of New York; National Fish and Wildlife Foundation - Long Island Sound Futures Fund Program

Staff work to cut Oriental bittersweet and other invasive plants from the restoration site. Photos provided by New York City Department of Parks & Recreation, Natural Resources Group.

Forest restoration area during beginning of second growing season, tree plants done the previous year can be seen in the foreground of the picture. In the background of the picture the Cross Island Parkway can be seen. The construction of the parkway was one of many reasons the hydrology of Alley Creek has been severely altered. Photo taken by Heather Young, NYSDEC.

Freshwater Wetland

The term 'freshwater wetlands' is used collectively to describe the diverse range of non-saline (and non-tidally influenced) ponds, bogs, fens, swamps, and marshes found in the world. The U.S. Fish and Wildlife Service wetland classification system created by Cowardin et al. (1979)[1] categorizes freshwater wetlands in the United States as palustrine, lacustrine, or riverine systems. The classification system also addresses deep-water habitats where the substrate is predominantly non-soil and flooding is permanent, but those types of wetlands generally are not included in the Long Island Sound Study Habitat Restoration Initiative.

Palustrine Systems

Palustrine wetland systems are defined by Cowardin et al. (1979) as non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens; or they may be non-vegetated, shallow water areas (less than six feet deep) with no wave formed or exposed bedrock shoreline features. To be considered palustrine, these non-vegetated areas must be less than 20 acres in size.

Lacustrine Systems

Lacustrine wetlands are wetlands and deep water habitats situated in a topographical depression or dammed river channel; lacking trees, shrubs, persistent emergent vegetation[2], emergent mosses or lichens with greater than thirty percent areal coverage; and with a total area larger than 20 acres. Certain wetlands smaller than 20 acres may be classified as lacustrine if there are active wave-formed or bedrock shoreline features making up all or part of the boundary, or if the deepest part of the basin exceeds 6.6 feet at low water (Cowardin et al., 1979). Although lacustrine wetlands do occur within the project boundary in Westchester County, NY, and in Connecticut, for the purposes of this initiative, restoration will focus on the shorelines of these bodies of water where the classification shifts to palustrine.

Riverine Systems

Riverine communities are defined by Cowardin et al. (1979) as "all wetlands and deep water habitats contained within a channel" except those that are dominated by persistent emergent vegetation, trees or shrubs (palustrine), or have more than 0.5 ppt ocean derived salinity (estuarine, marine). Community types are classified by the rate of water flow, which, in turn, dictates the substrate composition and faunal and vegetation types present. Although the Cowardin et al. system also includes tidally influenced, freshwater, non-persistent emergent riverbank vegetation, such as wild rice, all tidally influenced wetland restoration sites were included in the **Tidal Wetlands Restoration** chapter of this report.

Restoration Objectives

The major cause of wetland degradation is the alteration of the hydrology in the wetland system. This alteration may be caused by a number of activities such as draining, filling, and impounding. In the past, surface water supplies to wetlands have been diverted for drinking water reservoirs, flood control projects, cooling of industrial plants, and irrigation of crops. Other degradation may be caused by chemical inputs to wetlands, or invasion by exotic species. While degradation is caused by unique combinations of circumstances in each affected wetland, some general causes and restoration methods

can be outlined. These methods include fill removal, invasive species control, relocation of excessive runoff, and other hydrological modifications.

In New York, one freshwater wetland restoration project was completed during 2009, for a total of 1 acre restored.

[1] Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, FWS/OBJ.79/31. Washington, DC. 103 pp.

[2] Persistent emergent plants are those that leave all or a visible portion of their foliage above the saturation zone or water surface during the dormant season. Conversely, non-persistent emergents are those plants that leave no portion of their foliage visible during the dormant season.

Dickersons Pond-Sheldrake Riverbank Restoration

State: New York

Town: New Rochelle

Habitat Type: Forest wetland

Acres Restored: 1

Cause of Degradation: The streambank of this section of the Sheldrake River was suffering from erosion due to hydrologic modification during land development.

Project Description: The river banks of the Sheldrake River, north of Dickermans Pond, a man made impoundment were re-graded using sediments dredged from the Pond. As the area has been developed, the stream flow has become more turbulent and the riparian areas became dominated by invasive plants, such as *Phragmites* and Japanese knotweed. The re-graded banks were re-planted with various native wetland species. The outfall of two stormwater pipes was reconfigured to prevent future erosion and scouring.

Implementation Partners: City of New Rochelle, Westchester County

Funding Provided By: New York State Department of State Clean Water Clean Air Bond Act, County of Westchester, City of New Rochelle and the Town of Mamaroneck.