



# Coastal Habitat Restoration Efforts

## History

Connecticut began its first restoration work in the 1930's, conducting wildlife habitat management under the State Board of Fisheries and Game. The State Board existed until 1971, when it was incorporated into the newly established Department of Environmental Protection (now the Department of Energy and Environmental Protection, "DEEP"). Since its establishment, DEEP has continued to pioneer efforts to restore a variety of natural habitats, including important coastal habitats, for numerous plant and animal species.

## Activities

DEEP conducts or supports the restoration of coastal habitats, which are a management priority for Long Island Sound, in conjunction with various conservation partners. DEEP works closely with academic institutions, municipalities, and nongovernmental agencies like The Nature Conservancy, the National Audubon Society, and Coastal America. DEEP also works directly with the U.S. Environmental Protection Agency and the Long Island Sound Study, the U.S. Fish & Wildlife Service, the Natural Resources Conservation Service, and other federal agencies that can provide technical support, scientific insights, and funding for coastal habitat restoration projects.

### Coves and Embayments

The Coves and Embayments Restoration Program was started in 1983 to address degradation of tidal coves and embayments resulting from tidal flow alteration, water quality degradation, and increased sedimentation. This program provides funding and technical assistance to municipalities to restore degraded tidal coves and embayments and other coastal habitats.

#### Accomplishments

Seventeen coves and embayments have been restored along Connecticut's coast by providing funding for planning studies and/or restoration activities, including Norwalk Mill Pond, Norwalk, Davis Pond, East Lyme, and Alewife Cove, Waterford/New London.

### Coastal Barriers, Beaches & Dunes

DEEP provides technical support to towns and citizens for dune restoration and has restored a number of dune areas on state beaches. The Long Island Sound License Plate Program has funded several municipal programs for beach grass planting.

#### Accomplishments

Dune complexes in seven coastal towns from Stamford to Groton have been restored through technical assistance and funding for beach grass planting.

### Riverine Migratory Corridors

DEEP has an active program to restore riverine migratory corridors which serve as essential habitat for diadromous fish. Through its fisheries, wildlife, rivers, wetlands, and coastal management programs, DEEP facilitates corridor restoration projects by identifying projects and cooperators, providing scoping and design services, coordinating construction, and securing funding. In addition, the Rivers Restoration Grant Program provides funding for re-vegetation, soil erosion control and water quality improvements.

#### Accomplishments

Riverine migratory corridors have been restored at 33 sites in 22 towns by providing technical assistance and/or funding for construction of fish ladders or dam removal, including Leesville Dam on the Salmon River in East Haddam, Greeneville Dam on the Shetucket River in Norwich, Moulson Pond Dam on the Eightmile River in Lyme, and Chalker Millpond Dam in Old Saybrook.

### Tidal Wetlands

Focused efforts to protect tidal wetlands began with the passage of the Tidal Wetlands Act in 1969. Today DEEP is recognized as a national leader in tidal wetlands restoration. To learn more about DEEP's Tidal wetlands restoration efforts, visit the [Tidal Wetlands Restoration](#) page.

### Accomplishments

Over 1,700 acres of tidal wetlands have been restored from Greenwich to Stonington, including Long Cove, Guilford; Hammock River, Clinton; Mumford Cove, Groton; and, Barn Island, Stonington. The [tidal wetlands complex](#) of the lower Connecticut River have been designated as Wetlands of International Importance under [The Ramsar Convention](#). Additionally, under DEEP's supervision over 200 osprey platforms have been installed, providing new nesting locations and replacing lost habitat within tidal wetlands.

### Other Coastal Habitats

Several DEEP grant, advisory, and technical programs also support the restoration of these important coastal habitats:

#### Coastal Grasslands

Restoration of coastal grasslands include the Lynd Point meadow and the *Liatris* meadow in Fenwick, a borough of Old Saybrook, and twelve acres of upland meadow at the Mamacoke Conservation Area in Waterford owned by Connecticut College. The seeding of specific grasses in these areas will provide increased nesting cover which is critical to grassland birds and certain types of waterfowl.

#### Coastal and Island Forests

Restoration of coastal and island forests include five acres on Calf Island in Greenwich, a part of the Steward B. McKinney National Wildlife Refuge, and 33 acres in the H. Smith Richardson Wildlife Preserve in Westport. DEEP has also acquired thousands of acres of property and conservation easements to protect existing coastal forests, including The [Barn Island Wildlife Management Area](#) in Stonington, [Candlewood Ridge](#) and the [Avery Farm](#) Nature Preserve in Groton, and [The Preserve](#), which was recognized as the largest remaining unprotected coastal forest between Boston and New York prior to its acquisition for conservation.

#### Freshwater Wetlands

Freshwater wetlands typically occur within the watersheds of coastal forests. Thus, wetland restoration is sometimes included in the overall restoration planning for coastal forests. Freshwater wetlands are also created as compensatory mitigation for projects under a Clean Water Act Section 401 Water Quality Certification for state projects. The Inland Wetlands Management section within DEEP's Land and Water Resources Division (LWRD) advises state and municipal agencies on methods of freshwater wetland restoration for projects that require mitigation.

#### Submerged Aquatic Vegetation

DEEP has supported several research studies to determine the specific causes of SAV bed decline within Long Island Sound, as well as eelgrass seeding and transplanting projects. A large scale eelgrass restoration study was completed for [Mumford Cove](#) in Groton. It examined the loss of eelgrass attributed to water quality impacts from wastewater discharge into the cove and the reestablishment of an eelgrass meadow, ensuing the removal of the wastewater outfall pipe.

#### Shellfish Reefs

In 2013, DEEP partnered with Connecticut Sea Grant, the Connecticut Department of Agriculture's Bureau of Aquaculture, and several other state and federal agency partners and stakeholders to develop the [Connecticut Shellfish Initiative](#) (CSI). CSI is a program that strives to protect and restore Connecticut's shellfish habitats for sustainable and prosperous shellfisheries and to increase public awareness of Connecticut's shellfish heritage and the state's commercial, recreational, and natural shellfish resources.

## Highlighted Projects

Long Beach West, Stratford

Great Creek at Silver Sands State Park

Holly Pond, Stamford/Darien

## How Can You Help?

- Volunteer for citizen monitoring efforts
- Participate in beach grass planting projects
- Adopt environmentally friendly lifestyles
- Sponsor or participate in local clean-up projects
- Contribute to the Endangered Species/Wildlife Fund through the Connecticut income tax check-off
- Support existing funding sources by purchasing Long Island Sound license plates and Connecticut Duck Stamps
- Support federal, state, and local government coastal management and clean water efforts which result in coastal habitat protection.



Volunteers planting dune grass at Brides Brook, Rocky Neck State Park in Niantic

# Stratford Long Beach West Restoration

## Background

Long Beach West is 35-acres of barrier beach adjacent to [Long Beach](#) in Stratford and connected to [Pleasure Beach](#) in Bridgeport ([Figure 1](#)). Together, they form the longest coastal barrier spit in Connecticut. Through much of the 20<sup>th</sup> century, Stratford leased a number of land lots on Long Beach West to residents, on which they maintained private summer cottages.<sup>1</sup> Cottage owners and visitors accessed Long Beach West via the Pleasure Beach Bridge – a swing bridge completed in 1927, which connected the northern tip of Pleasure Beach to the south end of Central Avenue in Bridgeport. However, a fire occurring in the early summer of 1996 heavily damaged the bridge, rendering it unusable.<sup>2,3</sup>

In the wake of the bridge fire, the Town of Stratford terminated its leases on Long Beach West since it was no longer accessible to fire and emergency vehicles. Ultimately, the lessees were forced to abandon their cottages.<sup>3</sup> Following their abandonment, the cottages were repeatedly vandalized by people accessing the area by boat or on foot from the east end of the barrier beach at Oak Bluff Avenue. After the proposal to replace the Pleasure Beach Bridge was permanently scuttled due to the exorbitant cost, Stratford voters approved the transfer of Long Beach West to the U.S. Fish & Wildlife Service (FWS) in November 2008.<sup>1</sup> Unfortunately, the transfer never materialized; however, the FWS continued its interest in restoring Long Beach West. In 2009, The FWS Southern New England-New York Bight Coastal Program Office received almost \$1 million in American Recovery and Reinvestment Act funds to return the beach to its natural state.<sup>4</sup> Planning was then initiated to restore the barrier beach by removing the 41 derelict cottages and all associated structures.<sup>5</sup>

Several partners, including the Department of Energy and Environmental Protection (DEEP), participated in the restoration planning process. This extensive process involved procurement of the necessary funding for the project and obtaining DEEP authorization to conduct the restoration work within state regulated areas. The approval process required significant environmental assessments, including examination of sensitive habitat areas and evaluation of the potential adverse impacts to existing coastal resources. Seasonal work restrictions were also necessary to protect shorebirds listed as threatened or of special concern that inhabited the area, which limited the timeframe the restoration work could be accomplished.

The restoration of Long Beach West finally broke ground in late September 2010, and demolition of the cottages ensued within a few weeks. By the following February, all 41 cottages and associated structures, plus utility lines and access roads, had been razed and most of the remaining debris and contaminants had been removed. Completion of the project successfully returned Long Beach West to its natural state, providing 20 acres of sheltering, foraging, mating, and nesting area for migratory birds, including the state- and federally-threatened piping plover and the state-threatened least tern ([Figure 2](#)).<sup>5,6</sup> Although Long Beach West is open to the public, it is safe from future development and will remain a nature preserve.

The Long Beach West Restoration Team received several awards for their restoration accomplishment, including the 2011 Department of Interior [Environmental Achievement Award](#) and the 2013 Award for [Best Restored Beaches](#) from the American Shore & Beach Preservation Association. On June 4, 2012, the Obama Administration honored the Long Beach West Restoration Team with the Coastal America Partnership Award – the nation’s highest accolade for environmental restoration partnership projects.<sup>7</sup>

## Articles & Videos

[Putting Your LIS Plate Money to Work: Restoration of Stratford Barrier Beach](#)

[Update: Long Beach West Restoration Project Moves Forward](#)

[Long Beach West Cottage Removal for Habitat Restoration](#)

[Long Beach West Cottage Removal and Habitat Restoration](#)



Figure 1. Infrared orthoimagery taken, 9/8/1995 at low tide showing the barrier spit extending west from the Lordship neighborhood in Stratford



Figure 2. Orthoimagery taken, August 2016 at low tide showing the barrier spit 5 years after restoration



# Great Creek Outlet Improvements

## Background

The Great Creek watershed encompasses 504 acres, occurring mostly within Silver Sands State Park in the Town of Milford. Great Creek originally discharged into Long Island Sound between Silver Beach and Fort Trumbull Beach. When the Silver Beach neighborhood was developed at the start of the 20<sup>th</sup> century, an outlet pipe for the creek was placed under East Broadway and the beach between Blair and Tremont streets. The stream flow and tidal flux of Great Creek was then further confined by culverts consequent to residential development around Meadowside Road in the early 1940s ([Figure 3](#), upper photos).

After years of recurrent flooding in the Silver Beach neighborhood, the outlet for Great Creek was relocated in 1986 to control flood levels by widening an existing tidal ditch running west above James Street and Cooper Avenue and channeling almost 2,000 feet down to the Sound between Sam Smith Lane and Pearl Street ([Figure 3](#), lower photos). The new outlet completed in 1989 consisted of 260 linear feet of box culvert, which was 16 feet wide and 5 feet high, a concrete gate vault containing two self-regulating tide gates and two sluice gates, and an 18-foot wide open channel lined with 180 linear feet of timber training walls. With some modification, the new structures worked as intended; however in less than 20 years components of the flood control system began to fail.

In 2006 one of the training walls for the outlet collapsed after a storm, prompting investigation of the integrity of all the outlet structures. Upon completion of the investigation, which found several parts of the system deteriorating, the Department of Energy and Environmental Protection (DEEP) began the planning process for restoration of the outlet system. Authorization for the Great Creek tide gate and outlet structure improvements was issued in 2014, and the project was completed in 2015 ([Figure 4](#)).

## Analysis

### [Tide Gate and Outlet Structure Investigation, Great Creek Outlet Structure](#)

Prepared for DEEP by Fuss and O'Neill, April 2012

### [Engineering Investigation Services/Coastal Processes Evaluation: Great Creek Outlet, Silver Sands State Park](#)

Prepared for DEEP by Woods Hole Group, May 2013

### [Public Presentation to the City of Milford](#)

Given by Fuss and O'Neill and Woods Hole Group, November 14, 2013



Figure 3. Aerial Photographs showing Great Creek

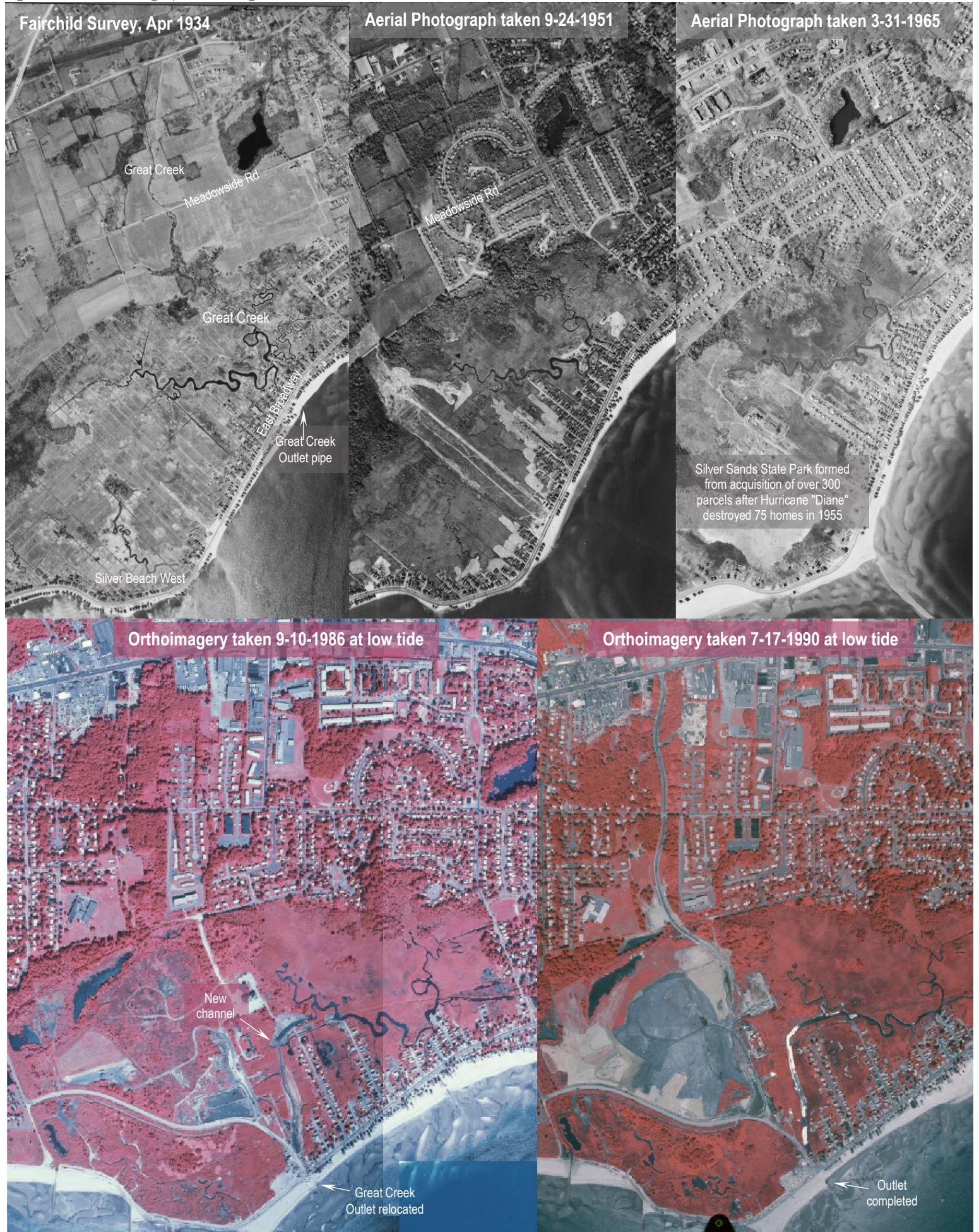




Figure 4. Orthoimagery taken, Apr 2016 at low tide





# Holly Pond Restoration

## Background

Holly Pond is an estuarine embayment connected to Long Island Sound and the Noroton River between the towns of Darien and Stamford, Connecticut.<sup>1</sup> Holly Pond has an extensive history of manipulation subsequent to its original existence as a deep natural bay open to Long Island, known as Noroton Bay. In 1796, William Fitch and John William Holly erected a dam 3.5 feet above mean sea level across the bay's opening to the Sound in order to power a gristmill using the constrained tidal flow.<sup>2</sup> Restricting the tidal flow trapped both pollution and sediment flowing from the Noroton River into the dammed bay, decreasing its depth and generating fetid conditions. Thus the dam was opened periodically to flush out the pond.<sup>2,3</sup>

The original dam existed for 142 years before it was breached by the Great New England Hurricane of 1938, and the pond became a bay once again. However, the increased tidal flow exposed the noxious bottom sediments of the pond during low tide ([Figure 5](#)). Holly Pond remained in this state for 22 years until the dam was reconstructed, incorporating flap tide gates, but it soon became evident that these structures did not afford adequate tidal flushing of the pond.<sup>2,3</sup>

From that time, Holly Pond continued to experience progressive sedimentation and repeated tide gate failures, prompting several studies.<sup>4</sup> Following a sedimentation study completed in 2010 by the City of Stamford, the Department of Energy and Environmental Protection (DEEP) began the planning process for the restoration of Holly Pond and the lower Noroton River. Determination of the final restoration plan for Holly Pond continues.

## Available Studies

### [Holly Pond Restoration Alternatives Analysis Final Report](#)

Prepared for DEEP by Louis Berger, June 2016

### [Holly Pond Sedimentation Study, July 2010](#)

Prepared for the Stamford WPCA by CH2M HILL

### [Ecological Study of an Impounded Estuary, Holly Pond, Stamford, CT](#)

Prepared by Charles Yarish, Ph.D. & Priscilla W. Baillie, Ph.D., for the Stamford Environmental Protection Board, September 11, 1989

### [An Assessment of Coastal Resources in the Vicinity of Holly Pond \(Stamford, CT\)](#)

Prepared for the Stamford Environmental Protection Board by Peter E. Pellegrino, Ph.D., December 1986

### [Holly Pond Marsh Survey](#)

Prepared by Christie Love, July, 1986

### [Study of Cove Pond and Dam, Stamford-Darien, Connecticut](#)

Prepared for DEEP by Frederic R. Harris, Inc., May 1973



Figure 5. Aerial Photographs showing Holly Pond

