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# TIDAL MARSHES OF LONG ISLAND SOUND:

## ECOLOGY, HISTORY AND RESTORATION


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# FOREWORD

This bulletin represents the culmination of several decades of work on the part of both the citizens of Connecticut and State agencies, such as the Department of Environmental Protection, to not only protect coastal wetland resources by enforcing the regulations in the Tidal Wetlands Act, but also launching an aggressive program in marsh restoration. An impressive effort has been made in Connecticut with at least 600 hectares (1,500 acres) restored due to the efforts of Department of Environmental Protection Staff, especially Ron Rozsa and Paul M. Capotosto. Ron, an ecologist with the Office of Long Island Sound Programs, has pioneered in restoration efforts. Paul, a Wetlands Restoration Biologist in the Wetlands Restoration Program, Wildlife Division, has moved the traditional mosquito control program into one involving open marsh water management, where biological controls - small fish - take over the removal of mosquito larvae wherever possible. These efforts, instead of constantly degrading our wetland resources, are reestablishing valuable lost habitat. The continuing pace of tidal marsh research over the past three decades has further documented the significant ecological role of these vital "liquid assets."

William A. Niering, Research Director
Connecticut College Arboretum

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# INTRODUCTION

Glenn D. Dreyer, *Director,*
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Thirty-five years ago the Connecticut College Arboretum issued an alarm to the citizens of the State with the publication of Arboretum Bulletin No. 12, "Connecticut's Coastal Marshes: a Vanishing Resource" (1961). At that time the ever increasing pace of coastal development - marinas, transportation facilities, residential and commercial construction - threatened to swallow up most of these important and fragile estuarine ecosystems. During the height of coastal development, some estimates put the loss of tidal marshes at the rate of four-tenths of a hectare (one acre) per day. Historically it appears that about 30 percent of all tidal marshes in Connecticut were destroyed, with the greatest losses in the western part of the State. One of the most dramatic events was when Sherwood Island Marsh, in Sherwood Island State Park, was buried by hydraulic fill. This was documented by the late Louis Darling, noted local author and artist, in the Bulletin mentioned above.

In addition to the story of Sherwood Island marsh and the politics involved in trying to save it, the Bulletin explained the scientific, economic, and aesthetic values of the marshes. The final chapter, by Arboretum Director Richard H. Goodwin, entitled "The Future: a Call to Action," suggested five areas which required immediate attention: 1. protection of marshes through acquisition; 2. protection of marshes in public ownership; 3. control of dredging and filling; 4. zoning changes; 5. education "on a broad front." As an indication of the great progress made in tidal marsh protection, it is worth while to address each of these concerns.

### Protection Through Acquisition

The Connecticut Department of Environmental Protection presently owns nearly 30% (1,956 hectares or 4,833 acres) of all tidal wetlands in the State, which reflects a long history of land acquisition for parks, forests and wildlife

purposes. These lands came into State ownership in a variety of ways; for example, through private grants like that from the White Memorial Foundation in 1962. A portion of these funds was used to purchase 19 parcels, totaling 42 hectares (103 acres) on the Connecticut River. Other State acquisitions on the river at about the same time included tidal marshes in Lord Cove, Haddam Neck and Higganum.

Salt Meadow National Wildlife Refuge, Connecticut's first such national preserve, was established in Westbrook in 1971 and includes 14 hectares (35 acres) of tidal wetland. In 1994, the U.S. Fish & Wildlife Service acquired over 120 hectares (300 acres) of tidal wetland at the Great Meadows in Stratford, as an addition to the Stewart B. McKinney National Wildlife Refuge. This refuge contains the largest area of unditched high marsh along the Sound. At the municipal level, many towns own tidal wetlands and, through municipal regulations, marshes may be set aside as permanent open space during commercial development projects.

In the 1960s the Connecticut Land Trust movement began with early organizations in Madison, Guilford, Old Lyme and Westport. A principal focus of these pioneer groups was the acquisition of tidal wetlands. Today there are at least 26 different land trusts along the Connecticut coast and major river systems which aid in wetland protection.

Since 1961, The Nature Conservancy has become the largest private land conservation organization in this country and the world. In Connecticut it owns over 160 hectares (400 acres) of tidal wetland, including large portions of the tidal freshwater system at Chapman Pond in the Connecticut River, and Pattagansett Marsh in Niantic. The Conservancy also works actively in supporting local land trusts, and in creating conservation easements which assure protection while keeping the property in private hands.

### Preservation of Marshes in Public Ownership

Louis Darling, in Bulletin No. 12, described the loss of a tidal wetland at Sherwood Island State Park through the disposal of dredged sediments from the construction of Interstate 95 and a parking lot. Today tidal marshes in State ownership are protected by the same laws which affect private lands.

Of the four other State-owned areas with significant tidal marshes specifically mentioned in Bulletin 12, three - Barn Island, Hammonasset and Bluff Point - have received attention and protection in the ensuing years. At Barn Island, several of the formerly impounded valley marshes have been restored by increasing tidal flushing. For example, Impoundment No. 1 is in the process of restoration with most of the area back in *Spartina* grasses after being dominated by Cattail and Phragmites for many years.



Large portions of the tidal marshes within Hammonasset State Park were designated as a State Natural Areas Preserve in 1985. The goals of the Preserve are to protect the integrity of the ecosystem, to preserve rare and endangered species, and to promote education and research.

By a special act of the State Legislature in 1975, Bluff Point, including the tidal marshes of Mumford Cove and the Poquonock River, was declared a State Coastal Reserve. This is the only state owned land preserved with this special category.

The Parks Division of the Connecticut Department of Environmental Protection (DEP) has recently completed a master plan for Silver Sands State Park in Milford. This abandoned municipal landfill, which has been closed and covered, will accommodate active recreation and parking. Critical associated resources will be restored, including tidal wetlands. Here the DEP recently restored tidal flushing to the seven hectares (18 acres) of Fletcher's Creek and will construct several boardwalks across the marsh to provide public access and education about tidal wetland restoration.

In October 1994, at a ceremony held at Gillette Castle State Park, Secretary of the Interior Bruce Babbitt announced that portions of the tidal wetlands and waters of the Connecticut River, from Portland to Long Island Sound, had been designated as "Wetlands of International Importance" (Fig. 1). This is a program of the Ramsar Convention, an intergovernmental treaty that provides a framework for international cooperation in the conservation of wetland habitats. The Connecticut DEP included all of its Connecticut River tidal wetlands within both State Parks and Wildlife areas. It also includes a series of wetlands protected by The Nature Conservancy, the town of Old Saybrook, the East Haddam Land Trust, the Middlesex Land Trust, the Deep River Land Trust and the Connecticut Audubon Society.

*Fig. 1 Bruce Babbitt, US Secretary of the Interior, speaking at the October 1994 ceremony which declared tidal wetlands in parts of the lower Connecticut River "wetlands of international importance." (P. Fusco)*

### Control of Tidal Marsh Dredging and Filling

The Connecticut Tidal Wetlands Act of 1969 (see appendix) effectively ended the destruction and despoliation of estuarine wetlands in this State, and a similar New York Act in 1973 solidified protection for all of Long Island Sound. Draining, dredging, excavating and filling are now regulated activities, for which authorization must be issued from the Connecticut DEP (or the New York Department of Environmental Conservation) after due consideration is given to the effects of the proposed work on the ecology of these systems.

### Zoning Changes

Connecticut has not directly pursued protection via zoning for a variety of legal reasons. However, zoning is used to regulate the type and density of development at a given site. Wetland setbacks are specified in some towns, and wetlands are often used to satisfy requirements for open space as part of new subdivisions

The Coastal Area Management Act of 1980 gave the 36 coastal towns the authority and responsibility to consider the impacts of a proposed development upon a variety of coastal resources, including tidal wetlands. In part, this requires the consideration of alternatives that minimize wetland impacts. The Act also established a voluntary planning process called Municipal Coastal Programs, which provides towns with the opportunity to improve resource protection and balance competing uses by updating both the municipal zoning regulations and plan of development. Most of Connecticut's coastal towns have participated in this program.

### Education

Connecticut College has continued its leadership role in wetlands education in a number of ways. To help educate students and the general public, the Arboretum has published five bulletins about tidal marshes since 1970. A complete list of Arboretum Bulletins may be found at the end of this publication. In 1978 the College initiated an upper division undergraduate course entitled Tidal Marsh Ecology. Soon after, Coastal Marine Biology also became part of the curriculum.

The Connecticut DEP has also played an important role in educating our citizens about the importance of the State's natural resources in general, and those of the coastal zone in particular. Publications such as "A Moveable Shore - the Fate of the Connecticut Coast," "A Salt Marsh Primer," and "Long Island Sound: a Natural Resource Atlas" have targeted a variety of audiences. Staff members have participated in hundreds of speaking engagements for schools, municipal groups and public organizations. The DEP operates the Meigs Point Nature Center and Boardwalk at Hammonasset Beach State Park, where it offers interpretative walks of the salt marsh ecosystem led by trained educators. The Department also sponsors a variety of programs, from tidal wetlands ecology field techniques workshops to teacher training sessions at shoreline State parks.



We have come a long way in the last three and one half decades. From an historical perspective the 1969 Tidal Marsh Act was truly a watershed event, one which signaled a changing environmental ethic felt at the national level during the first Earth Day in 1970. From that time forward the wholesale destruction of tidal marshes in Connecticut was stopped and serious preservation and research efforts began. The formation of Conservation and Inland Wetlands Commissions in each of Connecticut's towns further aided in the protection of these and other wetland ecosystems.

Perhaps one of the most significant aspects of our societal relationship with tidal wetlands, one not foreseen in 1961, is the effort to restore degraded marshes. In 1992 the DEP created a team of professionals to begin tidal wetland restoration in Connecticut. By the close of 1992 over 600 hectares (1,500 acres) had been restored. Lessons learned from these efforts are also highlighted in this bulletin.

This publication is a continuation of the educational effort begun in 1961 with Bulletin No. 12, in which we present an overview of Long Island Sound's tidal marshes. Previous bulletins have emphasized specific groups of organisms, or special techniques used to understand marsh development. Here we emphasize the history, ecology, and restoration of tidal marshes.

## SUGGESTED READING

Coastal Area Management Program. 1977. Long Island Sound: an Atlas of Natural Resources. Connecticut Department of Environmental Protection, Hartford, CT. 52 pp.

Connecticut's Coastal Marshes: a Vanishing Resource. Connecticut College Arboretum Bulletin No. 12. 1991. The Connecticut Arboretum, New London, CT. 36 pp.

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