

PREFACE

This resource book grew out of the Conservation Law Foundation (CLF) participation in a national initiative to restore America's estuaries and CLF's regional marine resources project to preserve and restore marine and estuarine resources in the Gulf of Maine. At the national level, the work has produced a guide to all the possible federal sources of funding. It has introduced new federal legislation that is close to passage in Congress as of¹ The legislation will help integrate and coordinate the work of the various federal agencies concerned with estuary restoration. It will provide significant funding to local groups around the country that are undertaking estuary restoration projects. In New England, in collaboration with the Island Institute (II) and the Conservation Council of New Brunswick (CCNB), CLF published Rim of the Gulf: Restoring Estuaries in the Gulf of Maine. It details the extensive losses of estuary resources throughout the Gulf of Maine. CLF is, also engaged in a restoration project with the Chelsea Human Services Collaborative in Chelsea, Massachusetts.

This initial survey demonstrated the pervasive adverse human impacts in the coastal zone and convinced us that the restoration of degraded habitats is as important as preservation of the remaining estuarine and marine habitats. Of all the threats faced by vegetated tidal marshes, the most common is the loss of tidal flows. Unlike other wetlands, tidal marshes can exist only in the narrow zone along the shore that is within the range of the tide. Without tidal exchange, a tidal marsh becomes a freshwater wetland (such as Sherman Lake in Newcastle) and the marsh's unique ecological contributions are lost. Thus, free tidal exchange is essential to the existence of tidal marshes²

Although Maine has more tidal marsh area than any state north of New Jersey and more than any state or province in the Gulf of Maine, Maine (with notable exceptions in southern Maine's large barrier marshes) knows less about its

¹ Restore Americas Estuaries (RAE) *Funding for Habitat Restoration Projects, A citizen's guide*, The Estuary Habitat Restoration Partnership Act, S.835 and H.R. 1775. For more details, see the RAE website: www.estuaries.org

² Even when assured of tidal exchange, the tidal marsh is by no means home free: filling, dredging, pollution, encroaching development and other threats can also affect its vitality.

tidal marshes than the other New England states. In one recent tabulation of restricted marshes, Massachusetts had identified over 250 marsh crossings as potential restoration sites; Maine identified less than 20 (Cornelison, 1998, pp. 5-9). This dramatic discrepancy demonstrated that Maine lacks much basic information.

CLF's "Return the Tides" (RTT) project is intended to fill this information gap, using grassroots volunteers to help develop a better marsh information base for Maine. Return the Tides undertakes to inventory restrictive tidal marsh crossings. Our goal is to establish a working inventory of potential restoration sites throughout the coast and islands of Maine and to raise citizen awareness of the importance of tidal marshes, the multiple threats to them, and the potential for their restoration.

In this effort, we are pleased to join hands with many other agencies, non-profit organizations and individuals who have been fighting for salt marshes for years such as the U.S. Fish and Wildlife Service, the Maine Coastal Program at the State Planning Office, the Maine Audubon Society, the Wells National Estuarine Research Reserve and the dedicated staff and volunteers who work with these groups. By following the approach laid out in the following pages, and learning more from the resources identified in the Appendices, citizen activists will be able to undertake a tidal marsh crossing inventory in their area and begin developing marsh restoration projects. Ultimately, this guide is an action plan for the coast and islands of Maine directed toward those people who want to work in their own communities to produce positive environmental change.

We welcome our readers as full partners in these efforts.

INTRODUCTION: WHERE THE LAND MEETS THE SEA

In the natural world, the edges of places are very special. Most often, at the edge of the land and sea, vast biological action happens, a confluence of biological abundance and overlapping species from marine and riverine environments. The reason for this is simple. This is where different natural ecological systems -- each with its own set of characteristic flora and fauna -- meet and mix. These mixing zones are like natural stews, including features and species from both systems and, in some cases, species that are unique to the mixing zone.

Estuaries fall just below rainforests in the eyes of most ecologists in terms of their habitat value and biological productivity. Estuaries are where the ocean's salt-water ecosystems meet the land's freshwater and upland ecosystems. Salt marshes are the vegetated wetland fringes of estuaries. As a result, salt marshes share certain characteristics with freshwater wetlands with the added layer of ecological complexity that emerges from their intimate and overlapping tidal connection to the marine environment. They are very special places indeed.

Scientists wax poetic on estuaries, but you don't have to be an ornithologist, a botanist or an ichthyologist to appreciate the special qualities of estuaries. You don't even have to know that these areas that most of us who live or work in coastal Maine see every day are called "estuaries." You only have to be able to open your senses to these special places. For most people, one look is all it takes.

Killing the Golden Cod

The once vast and productive estuarine systems of the Gulf of Maine are in many ways responsible for the pre-European and colonial settlements of New England. European explorers came to the coast of what is now America for the same reason native tribes camped on the coast during the summer months: fish and shellfish. Historical records make clear what is no longer true: there was an enormous abundance of cod, alewives, and other desirable fish and shellfish species in the coastal waters of the Gulf of Maine.

Some coastal bays supported fisheries that landed millions of pounds of seafood a year – largely caught by hook-and-line! Tidal marshes provided much of the hay and pasturage needed by early settlers and also provided a rich harvest of shorebirds and waterfowl. The estuaries and nearshore waters of the Gulf of Maine once supported a truly world-class abundance of coastal and marine life.

Unfortunately, the early developers of New England's coastline and coastal rivers were great fishermen, captains of industry and civilization and conquerors of the wilderness, but they weren't great ecologists. Buoyed by the naive, self-centered, and virtually universal view that the ocean's reproductive powers knew no limits, the post-colonial history of the Gulf of Maine documents a systematic assault on the essential natural resources that first brought explorers to these shores. The next section of this book describes this in more detail. Coastal wetlands were drained or filled; human and animal wastes, and, later, industrial wastes were dumped into coastal waters with little or no thought given to the effects of these practices. Fishing occurred at levels that outstripped natural rates of replenishment. Our once-productive coastline has been badly exploited.

Returning Our Coasts

Only in the last thirty years have people begun to recognize the price our natural coastal environment has paid for human "progress." A broad range of interest groups including fishing communities, recreational fishermen and ordinary citizens question:

How much of the resource base has been lost?

How much have remaining resources been degraded?

How extensive are the habitat damages associated with those losses?

How much of the original resource base can be restored?

How will habitat restoration further the recovery of lost coastal resources and productivity?

How much effect will habitat restoration have on the coastal system's baseline productivity rates?

These questions cannot be answered completely at the moment. The 1998 survey of the estuaries of the Gulf of Maine (*Rim of the Gulf: Restoring Estuaries in the Gulf of*

Maine)₁ revealed a terrible consistency around most of the region. More than one-half of estuary marsh habitats have been lost and, in the Bay of Fundy, the losses are well over seventy-five percent. Many of these losses, like the damming of Boston's Charles River, are permanent. The losses in Maine may be less than elsewhere, but they are extensive, especially from Casco Bay south. Although there have been dramatic improvements since the 1970's, coastal water and sediment chemistry continues to be degraded by pollution. Forage species for the once enormous schools of cod and pollock have been reduced inshore as a result of habitat losses and the blockage of historic river runs of species like herring, alewives, and others. As a result, many cod and pollock stocks are greatly reduced, even in the absence of fishing pressure. We have lost a great deal and these losses still continue.

Offering a Solution

Given the current, deteriorated state of our coastal resources, the priority is to protect every functional estuary. Pollution control programs must be enforced and extended to include the contaminated runoff from lands, and the persistent complex chemicals that survive treatment processes. Fishery management throughout the Gulf needs to address the vital importance of reducing fishing to proper levels and protecting fish habitats so the fish stocks can rebuild. Finally, the strong federal and state laws and programs that have the capacity to save remaining estuarine habitats from further filling and degradation must be strictly enforced.

This book is intended to provide a tool for coastal groups and individuals who want to go beyond these important protective steps and undertake restoration of our scarce and unique tidal wetlands. The conventional goal for freshwater wetlands of "no net loss" must be modified. We must work to restore tidal wetlands, to add to the inventory. While scientists are understandably unwilling to speculate on what system-wide productivity returns will be associated with estuary restoration at particular sites, they are unanimous in supporting the critical importance of restoration. We believe that if some of these areas are restored, a significant measure of their original natural productivity and biological abundance will return.

The book is organized in two parts: the first several sections provide the citizen activist with a basic primer on estuaries and tidal wetlands; the vocabulary and fundamental concepts associated with these resources and their restoration; and some of the practical aspects of undertaking a restoration project. There are many references in the appendix to publications that will provide greater detail and understanding of these issues. In section 6, the reader is introduced to a methodology that grassroots organizations and individuals can follow to perform a baseline inventory and preliminary assessment of tidal marsh restrictions.

The Appendices present materials that can be used in training volunteers and in conducting an inventory.

The book is a work in progress and CLF welcomes your feedback on its strengths and weaknesses.

We start with a little science, a little policy, and a lot of restoration activities in the new millennium. We think that is just what the Estuary Doctor ordered.

