Global Programme of Action
Coalition for the Gulf of Maine

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Scoping Paper 5:
Physical Alterations to Water Flow and Salt Marshes

Protecting and Restoring Flow and Habitat in Gulf of Maine Salt Marshes and Watersheds

WORKING DOCUMENT FOR DISCUSSION PURPOSES ONLY

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Physical Alterations to Water Flow and Salt Marshes
Protecting and Restoring Flow and Habitat in Gulf of Maine Salt Marshes and Watersheds

Workshop II

Protecting the Gulf of Maine from Land-based Activities: A Working Meeting to Develop Strategies and Actions

Final draft of a working paper prepared for the
Secretariat of the Commission for Environmental Cooperation,
through a partnership with the
Global Programme of Action Coalition for the Gulf of Maine

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Profile of the Commission for Environmental Cooperation

In North America, we share vital natural resources including air, oceans and rivers, mountains and forests. Together, these natural resources are the basis of a rich network of ecosystems which sustain our livelihoods and well-being. If they are to continue being a source of future life and prosperity, these resources must be protected. Protecting the North American environment is a responsibility shared by Canada, Mexico and the United States.

The Commission for Environmental Cooperation (CEC) is an international organization whose members include Canada, Mexico and the United States. The CEC was created under the North American Agreement on Environmental Cooperation (NAAEC) to address regional environmental concerns, help prevent potential trade and environmental conflicts and to promote the effective enforcement of environmental law. The Agreement complements the environmental provisions established in the North American Free Trade Agreement (NAFTA).

The CEC accomplishes its work through the combined efforts of its three principal components: the Council, the Secretariat and the Joint Public Advisory Committee (JPAC). The Council is the governing body of the CEC and is composed of the highest-level environmental authorities from each of the three countries. The Secretariat implements the annual work program and provides administrative, technical and operational support to the Council. The Joint Public Advisory Committee is composed of fifteen citizens, five from each of the three countries, and advises the Council on any matter within the scope of the agreement.

Mission of the Commission for Environmental Cooperation

The CEC facilitates cooperation and public participation to foster conservation, protection and enhancement of the North American environment for the benefit of present and future generations, in the context of increasing economic, trade and social links among Canada, Mexico and the United States.

Global Programme of Action Coalition for the Gulf of Maine (GPAC)

Vision
A healthy marine and coastal environment in the Gulf of Maine where human use and biological diversity thrive in harmony.

Mission
The GPAC will work with all interested parties to assist in the application of the Global Programme of Action for the Protection of the Marine Environment from Land Based Activities (GPA). This Coalition will draw from and build upon the existing work of the Gulf of Maine Council, the Regional Association for Research in the Gulf of Maine, the Commission for Environmental Cooperation (CEC) and other organizations and individuals committed to the protection of this shared public resource of world-class cultural, economic, ecological and intrinsic value.

The GPAC will assist public and private entities in the Gulf of Maine region identify pollution and habitat priorities and work to strengthen the capacity of these organizations and individuals to address them.

1998 Objectives
- Identify and assess current knowledge on the marine and coastal habitats of the Gulf of Maine and the existing and potential effects of pollutants from land based activities on their sustainability.
- Organize a workshop of multidisciplinary and cross-sectoral participants to review this knowledge and produce a consensus list of the priority pollutants and critical habitats in the Gulf of Maine requiring immediate action.
- Identify strategies and measures related to the management of priority pollutants and critical habitats identified during this first workshop.
- Organize a second workshop of multidisciplinary and cross-sectoral participants to assess management strategies and produce a regional response with immediate and long-term measures intended to reduce pollutants and protect and manage habitat in the Gulf of Maine. It will include financing mechanisms and a process for review and evaluation of implementation success.
- Secure resources from interested stakeholders to begin implementation of actions to advance the elements of the Action Plan.

Results (late 1998-early 1999)
- Broad-based, cross-sectoral stakeholder consensus on regional habitat and pollutant priorities and commitment to responding to them.
- Implementation begins, within and across jurisdictions, including select demonstration projects.
- Transitional seed financial support from the CEC for implementation.
- Strengthened binational commitment to GPA implementation.
- Conclusion of GPAC role as regional stakeholders initiate implementation.

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EXECUTIVE SUMMARY

In 1996 the Gulf of Maine was chosen by the Commission for Environmental Cooperation (CEC) as the site of a pilot project to help North American countries implement an international program to protect their marine and coastal areas from land-based activities.

The Commission for Environmental Cooperation was established by Canada, Mexico and the United States in 1994 to address transboundary environmental concerns in North America.

The Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, known simply as the GPA, was developed under the auspices of the United Nations Environment Programme in 1995. Over a hundred nations, including Canada, Mexico and the United States, are signatories to the agreement.

The impetus for the GPA was international recognition that approximately 80 percent of all marine pollution stems from human activities on land. These activities, which range from municipal and industrial effluents to agricultural runoff, are physically altering and destroying coastal and marine habitats. The GPA calls on its signatories to preserve and protect the marine environment on a national, regional and international basis to reach the goal of "sustainable seas."

In the Gulf of Maine the CEC has brought together a diverse group of individuals—the GPA Coalition (GPAC) for the Gulf of Maine—to develop a project of their own design. This workshop is part of a multistage action plan devised by the group.

The GPAC action plan includes two workshops designed to: 1) determine the priority problems requiring regional action and 2) develop methods for their resolution.

This is one of the five scoping papers that are being developed to provide background information for discussion at the second workshop in Portland, Maine (15-17 November 1998).

Responding to the issues: Programs and Policies

The programs, policies, and legislation of the various government entities across the Gulf use several approaches to protection and restoration of salt marshes and coastal hydrology. These are regulatory programs, facilitation and coordination programs and funding programs. Tables 1 and 2 present an extensive descriptive list of these programs.

Regulatory Protection

Each of the three New England states along the Gulf of Maine have wetland protection programs which require review and approval of any proposed direct impact to tidal waters. The federal government retains the right to require a separate federal permit for projects that have substantial impact on wetlands, in most cases impacts to coastal wetlands and hydrology will require a separate federal permit. In the states much of the authority to control land-use has been invested in municipal planning boards. The New

England tradition of local control can lead to decisions being made from the sometimes narrow perspective of municipal needs.

Coordination and Facilitation

The facilitation and coordination of salt marsh and flow protection and restoration is done at all levels of government and involves many NGOs and private organizations. The protection work done through these programs is facilitating the acquisition of fee title or easements to ensure permanent protection of the resource. At the international level, the Eastern Habitat Joint Venture (EHJV) is a bi-national partnership including federal, jurisdictional and NGO partners. The Gulf of Maine Council on the Marine Environment (GOMCME) has made the protection and restoration of regionally significant habitats one of its five priorities. The Gulf of Maine Project of the Coastal Ecosystems Program [US Fish and Wildlife Service (USFWS)], the National Estuaries Programs of the US Environmental Protection Agency (USEPA), as well as the National Estuarine Research Reserve Program and the National Marine Fisheries Habitat Restoration Center [both supported by the National Oceanic and Atmospheric Administration (NOAA)], also assist and coordinate restoration and protection work. At the state level Coastal Zone Management Programs have been coordinating and supporting protection and restoration efforts for many years. In Massachusetts the Wetland Restoration and Banking Program (MWRBP) has led and organized efforts to restore the state's destroyed and degraded wetlands. In New Hampshire the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), a federal agency, has completed an inventory and analysis of all tidal restriction within the state, and it supports a very active restoration effort. Maine restoration efforts have been limited in scope as no state agency has sought to promote restoration.

Funding

Federal funds from the USFWS programs such as the National Fish and Wildlife Foundation, Partners for Wildlife Program, North American Wetlands Conservation Act and the Coastal Ecosystems Grant Program have helped to restore or protect marshes across New England. Assistance from NOAA through state coastal programs has also played an important role in promoting restoration and protection. NRCS has several funding sources available through the Farm Bill programs. While the use of these funds for salt marsh work may be limited, successful projects have taken in place in New Hampshire using this funding source.

Putting Policy to Work

Policy impact on protection

Loss of salt marsh through direct fill is an extremely rare event in Maine, New Hampshire and Massachusetts. It is technically possible to receive permits to fill salt marsh, but in practice these permits are only granted in extreme circumstances, and require expensive mitigation. In contrast to the strict laws protecting salt marshes in the United States, a common sight along the Fundy coast is a sign requesting fill. Areas of

marsh are frequently filled to increase holdings and prevent land loss. The great majority of flow obstructions in Gulf of Maine coastal watersheds are small culverts and dams. These structures are regulated at the local and state level, and fish passage is generally not a concern when these structures are put in place or repaired by road crews or developers. It appears that outdated, blocked or damaged fish ladders are preventing access to substantial areas of habitat throughout Maine and Massachusetts. Larger energy-generating dams or dams that generate power distributed across state lines must be licensed by the Federal Energy Regulatory Commission (FERC). FERC must consider a project's impact on fish passage, but it is a rare and unimaginably hard-won event when a license is denied because of fish. Historically, the trend in the Bay of Fundy has been to alter flow for economic benefit. The diking of the marshes provides valuable agricultural land.

Policy impact on restoration

Interest in and implementation of marsh restoration projects is developing real momentum in Massachusetts and New Hampshire. In New Hampshire the entire coastline has been surveyed and projects to restore tidal exchange have been identified and assessed by the NRCS (USDA 1994). In Massachusetts the MWRBP is mandated to promote wetlands restoration projects and has been particularly interested in restoring tidally restricted salt marshes. The MWRBP has put wetlands restoration on the map, particularly paying attention to public works projects that could be modified to facilitate restoration of tidal flow. A good example is the rehabilitation of rail service to Newburyport, which included enlarging culverts through the railroad embankment in the salt marshes of Ipswich, Rowley, and Newbury. USFWS has supported a number of marsh restoration and enhancement projects in the Gulf of Maine through their Partners for Wildlife, National Wildlife, and Gulf of Maine programs. Projects range from tide gate removal that restored tidal flow in a purple loosestrife meadow (Squamscott River marsh in Stratham, New Hampshire) to ditch plugging and panne construction that increased waterfowl habitat on Refuges in Maine and Massachusetts. Restore America's Estuaries is working with the Gulf of Maine Office of the Conservation Law Foundation (CLF) to develop community-based estuarine restoration efforts, including salt marsh restoration. CLF is currently developing an internet website designed to improve communication among community groups involved in estuarine restoration. Restoration of tidal flow has not been a priority in the Bay of Fundy. There are some dike systems and unused dams that have eroded or are eroding and allowing tidal flow to return to small areas. There have been no successful removals of tidal dams or causeways. The only active effort to restore flow has been in the Peticodiac Estuary. Just as Massachusetts and New Hampshire seem to be leading the way in the Gulf of Maine in terms of salt marsh restoration, Maine seems to be charting a new course when it comes to fish passage in coastal watersheds. In Maine, Coastal America partners, primarily NRCS, USFWS and Army Corps of Engineers (ACOE), have identified nearly 30 dams that could be removed or modified to allow fish passage, mostly downeast.

Effectiveness of Actions

There do not appear to be any overall measures of policy/program effectiveness regarding physical alterations to water flow and salt marshes in Gulf of Maine jurisdictions. Targets for minimizing marsh loss are not identified. Very little is being done to protect potential habitat or restore fish access to most coastal watersheds. The monitoring of salt marsh restoration projects was the subject of a 1998 conference held in Ipswich, Massachusetts, sponsored by Massachusetts Audubon, MWRBP, and GOMCME. There was clearly a difference in perspective between the scientists and managers at that conference about the need for and level of restoration monitoring. Unless marsh restoration projects are more consistently monitored, it will not be possible to determine their effectiveness, and thus the effectiveness of the programs which promote and support these policies cannot be evaluated. There is a strong tendency to assume that projects are successful upon completion of the required construction.

Most opportunities for restoration of tidal flow in salt marshes fall under the jurisdiction of federal, state or local Departments of Transportation (DOT). In the states, federal DOT policy does not require existing tidal restrictions to be enlarged, but allows for the use of funds to reduce environmental impacts in new construction, maintenance and repair projects.

Maintaining and Gaining Habitat: What are the Barriers?

Inadequate policy and funding

Buffers that control land use activities within zones along marsh and watershed shorelines are essential to the maintenance and improvement of coastal aquatic habitats (Desbonnet 1994). However, the critical element of shoreline buffers is missing from policy regarding physical alterations to water flow and salt marshes throughout the Gulf of Maine. Even in Massachusetts where the concept of buffers is incorporated into wetlands policy, there is great variation in enforcement from town to town, due in part to the nature of the regulations. In the states, federal funding is available to support coastal wetland and watershed restoration through a large number of programs, as recently summarized in a report by Restore Americas Estuaries (RAE 1998). A serious mismatch is evident, however, between the funds available for engineering design and construction of projects, and funds for monitoring to evaluate project success. In Canada there are few policies or mandates that directly address the restoration or protection of salt marsh habitat. There do not appear to be any policies or regulations in any Gulf of Maine jurisdiction that address removal of tidal and freshwater hydraulic obstructions. The majority of salt marsh habitat in the Bay of Fundy was diked and converted for agricultural land 300 years ago. Agricultural agencies are mandated to maintain these dikes, and have no official interest in marsh restoration.

Conflicts between Programs or Policies

A significant barrier to salt marsh preservation is the municipal, state or federal DOT. However, there are a number of examples in Massachusetts of cooperation between DOT and other agencies to bring about restoration of tidal flow during road maintenance. This

strategy is employed routinely in Connecticut, a state with an exemplary program to restore tidal flow to salt marshes. Existing wetlands protection regulations, however, can impose serious hurdles for restoration projects because of the many permits needed to carry out work in wetlands. In general, the same regulations that foster salt marsh protection act as impediments to salt marsh restoration. But obstacles to tidal restorations pale in comparison to the regulatory hurdles that must be overcome to remove dams in coastal watersheds. FERC oversees hydropower licensing of many dams, and is often perceived as having a strong bias in favor of industry. In Canada, the greatest impediment to habitat protection and restoration stems from conflicts with and within the provincial and federal governments (from the point of view of NGOs). On the Petitcodiac River in New Brunswick, a mandate to improve flow through a large causeway has not been implemented.

Lack of coordination or communication

Management of estuarine resources requires good communication between agencies and programs that traditionally focus on either freshwater or saltwater. There is often a lack of communication between departments at the provincial or state level, and management of estuarine habitats can fall through the cracks. In the states at the federal level, the ACOE, the National Marine Fisheries Service (NMFS), USFWS and FERC will all become involved in permitting issues regarding flow or salt marshes. Considerable difficulties can arise when so many players, each with a different mandate, try to come to consensus about the management of a salt marsh or coastal watershed.

Insufficient interaction with NGOs and community groups

Without efforts to 1) inform and educate citizens and non-resident property owners (especially adjacent landowners) about the benefits of tidal restoration, and 2) discuss the issue of flood hazard, it is almost certain that local opposition will be stronger than local support. Communicating the importance of salt marsh habitat to the public and to private landowners is imperative. Collaborations can be very effective between NGOs, which cultivate and depend on community support, and agencies such as USFWS and NRCS, which have access to funds for land protection and habitat restoration. There do not appear to be any examples of collaboration between NGOs and provincial agencies to address issues of physical alterations to water flow and salt marshes.

Private lands and resource use

In the Gulf of Maine flow obstructions in coastal watersheds are as ubiquitous as tidal restrictions in coastal wetlands. Numerous fish species collectively depend on access to and from spawning and feeding habitats in fresh, brackish and estuarine waters throughout coastal watersheds. All current uses of dammed watersheds (power, development and recreation) must be addressed in flow restoration projects. They can be daunting, but are not insurmountable (see case studies in full report).

Lack of consistency, accountability and enforcement

There is no regulatory framework in any jurisdiction regarding tidal restrictions. Tidal culverts and tide gates are often supervised by DOTs or public works for whom salt marsh ecology is seldom a consideration. In Canada, Watercourse Alteration Permits are required by both Nova Scotia and New Brunswick, but there are concerns regarding the adequacy of permit review. Environmental Impact Assessments (EIAs) are not required for the construction of new dikes, but such a requirement may be considered.

Breaching the Barriers

In this section we briefly describe projects that have surmounted (or avoided) one or more of the barriers often encountered when working to restore flow to salt marshes and coastal watersheds.

Linkages Lead to Multiple Returns

Linkages between salt marsh preservation and restoration

There are numerous ways in which protection and restoration activities can interact so that positive change in one arena leads to benefits in the other. Conversely, there can also be interactions whereby positive change in one arena occurs to the detriment of progress in the other. Here we first describe the different types of salt marsh restoration and suggest specific strategies for protection, then we present the nature of their linkages and the benefits and costs of the resulting interactions. So where and when could an activity described as restoration interact with a preservation action? We have explored this question through the use of the matrices in Tables 4 and 5. Such synergy can enable either preservation or restoration.

Opportunities for GPAC Action

In many ways, this is an exciting time to work toward improving flows and protecting and restoring salt marshes in the Gulf of Maine. There are several distinct fronts where action needs to be focused: regional planning and management, community participation, and collaboration. Action on each of these fronts will draw upon a variety human resources within the GPAC coalition, and will require support either from existing budgets or from newly identified funds. Specific recommendations under regional planning and management include: mapping tidal marsh losses and protected lands along marsh shorelines; ranking wetlands with respect to threat from shoreline development, draining or filling; assembling data on tidal restrictions and flow obstructions and prioritizing restoration projects; assessing spread of invasive plants; developing restoration success criteria; and selecting and implementing demonstration restoration projects. Community recommendations include: increasing public and decision-maker knowledge about costs of physical alterations and benefits from protection and restoration; and developing print, audio, video, and interactive CD and internet products toward this end. Recommendations under collaboration include: fostering regional or jurisdictional agreements to streamline restoration permitting; developing cooperative agreements to reduce tidal restrictions during road and rail maintenance; undertaking

discussions with FERC regarding flow and fish passage restoration priorities; undertaking discussions with ministries and departments regarding dikeland restoration priorities; and looking to the Deleware Bay dikelands restoration initiative as a model.