Maine Coastal Plan

Assessment and Strategy
under
Section 309 of the Coastal Zone Management Act

Submitted to the
National Oceanic and Atmospheric Administration
Office of Ocean and Coastal Resource Management

February 2001

Maine State Planning Office
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38 State House Station
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INTRODUCTION

PRIORITY ISSUES

Maine has had an approved coastal management program since 1978. Through a partnership with federal, state and regional agencies, local governments and other partners, the Maine Coastal Program attempts to balance the conservation and development of Maine's coastal resources. While the core of Maine's Coastal Program is the effective administration of environmental laws along the coast, the Program has conducted a wide range of projects over the last twenty-two years. From helping municipalities to plan for growth, to encouraging volunteer stewardship, to planning for public access, to developing innovative ways to manage marine resources, the Program remains active in a wide variety of coastal issues.

Section 309 of the Coastal Zone Management Act offers states the opportunity to enhance their current coastal management programs by developing improvements to core law authorities, creating new programs, and designing new funding sources. This enhancement program requires states to periodically conduct a needs assessment of nine coastal policy areas that are considered priorities at the national level. This *Plan* includes Maine's 2001 assessment of these issues. State priorities have been developed, and the strategies outlined in this document will guide our program enhancement efforts over the next five years, from 2001-2005.

Issue	Priority for Enhancement under Section 309
Ocean Resources Management	high
Aquaculture	high
Coastal Wetlands	high
Coastal Hazards	high
Marine Debris	low
Energy and Government Facilities Siting	low
Special Area Management Planning	low

Issue	Priority Issues for Other Funding
Cumulative Impacts of Development	high
Public Access	high

JUSTIFICATION FOR PRIORITIES

Priorities have been assigned to coastal management issues by considering: 1) the results of assessments developed for each coastal issue area; 2) identified state agency priorities reflected in their most recent strategic plans; and 3) concerns raised by individuals and organizations during the public participation process.

High Priority Issues for CZMA Section 309 Enhancement Funds

✍ *Ocean Management*

Ocean resource management has been a high priority issue for the Maine Coastal Program for the past eight years and continues as a priority concern. The continued loss of offshore wild fish stocks, and recent growth in new fisheries continues to put more pressure on near coastal fisheries. Significant concerns remain regarding the sustainable use of marine resources and the protection of important marine habitats. The economies of many of Maine's coastal communities are heavily reliant on commercial fisheries and related businesses, and the economic and social problems related to depleted fisheries are of concern to the Coastal Program. The Department of Marine Resources regards ocean governance and marine habitat research and protection as high priorities and the Department has a substantial need for additional support.

✍ *Aquaculture*

Economic development is a priority concern for Maine, which ranks 37th in the nation in per capita income. Aquaculture represents a way to improve the coastal economy in a significant and sustainable way, especially in some of the poorest regions of our coast. The challenge for Maine is to allow and encourage this industry to grow and prosper, while respecting environmental and social limits. Aquaculture development has become a particularly contentious issue since the last assessment was conducted in 1997, due to the listing of Atlantic salmon as an endangered species, and an increase in requests for aquaculture leases in new areas of the state. While the state, through the Department of Marine Resources has devoted additional resources to aquaculture policy development and management, there are still unmet needs.

✍ *Coastal Wetlands*

Although it is acknowledged that direct impacts to coastal wetlands have been lessened due to stringent standards contained in the Natural Resources Protection Act, impacts relating to upland activities and armoring of wetland boundaries are of concern. In addition to preservation of the physical boundaries of coastal wetlands, scientists and planners are now concerned with protecting wetland functions and values through a watershed approach to wetland conservation. The Coastal Program places a high

priority on development of new and more effective approaches to protection of coastal wetland resources.

✍ *Coastal Hazards*

Although the threats posed by coastal hazards are not pervasive to the entire coastline, continued erosion is an important concern for southern Maine's sandy beaches. Beach-related tourism is known to be a significant contributor to the local, regional and state economy. Due to increased momentum generated by the 1998 *Improving Maine's Beaches* report, towns are calling on the state to develop cooperative programs that will reduce threats to private property and that will protect important recreation areas and critical habitats. For this reason, coastal hazards are considered to be a priority issue for attention by the Coastal Program.

Other High Priority Issues

✍ *Cumulative Impacts of Development*

Managing the impacts of development on coastal resources continues to be a high priority for the Maine Coastal Program. Poorly sited and managed development continues to be the most pervasive threat to the coastal environment, with coastal nonpoint source pollution and habitat degradation as chief concerns. Maine's nationally recognized approach to Smart Growth includes regulatory and incentive-based approaches to encourage better development. Likewise, technical assistance to coastal municipalities and training of local officials remains an important core aspect of the Maine Coastal Program.

✍ *Public Access*

Public access was categorized in the 1997 *Maine Coastal Plan* as being a "medium" priority due to the presence of land acquisition programs such as the Land for Maine's Future program and boating access programs in other state agencies. However, coastal municipalities and commercial harvesters continue to place coastal access as a critical need. The Coastal Program recently produced *Coastal Water Access Priority areas for Boating and Fishing* which outlines a variety of needs along the Maine coast, for both recreation and commercial uses. Staffing levels in the Land for Maine's Future Program and other state agencies are extremely tight. The Coastal Program can play an important role in securing additional public access by stepping up its role in working proactively with towns and other partners to secure public access. A long term goal for the Maine Coastal Program is to reinstitute popular grant programs such as the coastal access planning grants and acquisition grants offered during the 1980's.

Lower Priority Issues

✍ *Marine Debris*

While marine debris is a pervasive problems in Maine, the impact of marine debris is not considered a primary concern. New approaches for dealing with persistent debris have been developed and we continue to seek new ways of reducing debris at the source. The Coastal Program continues to support and enhance cleanup programs during Coastweek. These efforts are considered appropriate at this time.

✍ *Energy and Government Facilities Siting*

There are few new energy and government facilities being sited in Maine, and there are existing regulatory authorities that are considered sufficient to address new developments and expansions. No changes to these authorities are suggested at this time.

✍ *Special Area Management Planning*

Maine has not had any federally designated special area management plans. Rather, we consider special area planning as a tool that can be used to address the impacts of development within certain sensitive areas along the coast. The Coastal Program has a priority coastal watershed strategy and beach management planning strategy in place that are discussed in appropriate sections of this *Plan* (see Impacts of Development and Coastal Hazards sections.)

SUMMARY OF PAST EFFORTS TO ENHANCE THE MAINE COASTAL PROGRAM 1997 - 2000

In February 1997, the SPO prepared a strategy to enhance the Maine Coastal Program as required under Section 309 of the Coastal Zone Management Act. Through a priority-setting process, Maine's most important areas for program improvements were identified as: Cumulative and Secondary Impacts of Development, Ocean Resources Management, and Aquaculture. Public access, coastal hazards and coastal wetlands were included in the next tier of priorities identified. Since then, the State has accomplished the following through CZMA Section 309 funding.

✍ *Cumulative and Secondary Impacts of Development*

Stormwater Management — Administrative procedures and guidance were developed to implement two new laws designed to address the most significant sources of non point source pollution in coastal waters -- the erosion and sedimentation control law (38 MRSA §420-C) and the stormwater management law (38 MRSA §420-D). Rules, application forms, permit procedures, site permit and enforcement protocols and outreach materials were developed. Department of Environmental Protection staff were trained to perform permit reviews and site inspections.

Analysis of Best Management Practices (BMPs) — A research project analyzing two BMP treatments provided important information about the use and effectiveness of the treatments in Maine's cold climate and soil conditions.

Watershed Management — The Legislature authorized the creation of a "Comprehensive Watershed Management Protection Program" (5 MRSA§3331(7)), directing the Land and Water Resources Council to coordinate the activities of state agencies involved in watershed management. An interagency Maine Watershed Management Committee (MWMC) was created and provides a forum for joint activities, communication, funding and policy direction for the watershed program. Based on criteria established in the law, the MWMC (in 1998) developed a list of priority watersheds for targeted funding and technical assistance. The Maine Coastal Program at SPO developed the Coastal Priority Watershed Protection program to focus on the 17 identified priority estuaries, to complement DEP's emphasis on freshwater priority waterbodies. Activities in support of the coastal watershed program included -- creation and support of watershed councils, development of a small grants program, establishment of new citizen monitoring efforts, support for new training programs, workshops and publications about watershed management, capacity building, and organizational sustainability. Several watershed councils are creating watershed management plans and municipalities are revising land use ordinances and stormwater provisions.

✍ *Ocean Resources Management*

Limiting Effort in the Lobster Industry — The Department of Marine Resources created and adopted new regulations to implement four new pieces of legislation concerning the lobster fishery addressing - limited entry within lobster zones, reduction of trap buildup, creating an appeals process and clarifying student licenses. Implementation activities also focused on the apprenticeship program and capacity building for the lobster zone councils.

Task Force on Subzones — Legislation was adopted in 1998 to establish the Monhegan Island Conservation Area, establishing a more limited trap season and trap limit than other parts of the state. The legislation also created a task force to look at the implications of additional subzones within the lobster zone structure. This management tool was explored and rejected.

Public Law 1999, Chapter 297 — *An Act to Establish a Framework for Management of Emerging Fisheries* was enacted, allowing the DMR Commissioner to initiate management measures for new or emerging fisheries at an early stage of development to avoid exploitation of the fishery. Lessons learned in the elver and sea urchin fisheries lead to this innovative new approach in state fisheries management.

✍ *Aquaculture*

New Aquaculture Lease Rules — New lease rules were developed to establish a new lease process designed to streamline permitting processes for research and development projects (experimental leases), and to avoid duplicative and unnecessary requirements in the lease process. New application materials were developed as well.

✍ *Public Access*

Proposal and Scoring Criteria — Criteria were developed for water access projects under the Land for Maine's Future (LMF) new $50 million land acquisition program. A municipal public access needs survey was conducted and a report entitled *Coastal Water Access: Priority Areas for Boating and Fishing* was published and distributed. The assessment will help prioritize proposals for LMF and other funding sources and will steer funders towards designated areas of need.

✍ *Coastal Hazards*

Regional beach management planning — Efforts have been completed in Saco and Wells Bays. The management plans brought together local stakeholders and state interests to design regulatory changes, erosion control approaches, public access and habitat improvements.

Additional Mapping and Classification of Maine's Soft Bluffs — Completed by the Maine Geological Survey (MGS), the maps provide needed background for eventual regulatory changes to increase setbacks in bluff areas and provide the core materials for public education and technical assistance activities carried out by MGS.

✍ *Coastal Wetlands*

Casco Bay Wetlands — A pilot project in the Casco Bay watershed translated the results of the Casco Bay Wetlands Prioritization Project to local officials in several Casco Bay municipalities. Towns are using the new information in comprehensive planning, design of regulatory approaches and in development of land acquisition strategies.

PUBLIC PARTICIPATION

[to be added later]

HIGH PRIORITY ISSUES FOR ENHANCEMENT PROGRAM FUNDING

OCEAN RESOURCE MANAGEMENT

"Ocean resources" is a broad term encompassing all the living and non-living resources that people use for economic and social purposes. In Maine, our ocean resources and maritime heritage largely define the character of the coastal communities. Maine's marine waters provide habitats for a diverse and varied assemblage of species and are home to at least 1,600 different types of bottom dwelling organisms, 73 different types of commercially-harvested fish, and 26 species of whales, porpoises and seals. This high diversity of marine life is supported by a variety of marine and estuarine habitat types including salt marshes, sandy beaches, rocky substrates, sheltered coves, eel grass beds, muddy and sandy sediments, gravel beds, and macroalgae.

Maine's marine and estuarine waters are also used for a variety of economic and recreational purposes including: commercial and recreational fishing; oil and cargo transportation; passenger transportation; and recreational boating. Tourists visit Maine from around the globe to enjoy these resources. Indeed, the economic well-being of many of Maine's coastal communities depends on the long term viability of our marine resources with many of our citizens deriving their income directly and indirectly from the ocean through fishing, processing, boat building, and wholesale trade.

Assessment of Threats and Conflicts

Protecting the ecological health of marine resources and resolving conflicts over the use of marine resources continue to be important issues in Maine. The issues that remain of most concern are: marine fisheries management; marine habitat protection; competing uses of public waters; and management of dredging activities.

Marine Fisheries Management

The Gulf of Maine supports a significant commercial fishery. According to a recent University of Maine study, Maine's seafood industry provides 26,000 jobs and $777 million in economic impact to the state economy. Maine is also first in revenues for landed fish in the Northeast with a total landed value of all species in 1999 of $323.8 million. Atlantic herring, lobsters, the groundfish complex, and sea urchins are the largest catches by weight with lobsters, sea urchins, groundfish, soft-shell clams, and scallops comprising the highest landed value.

Maine's commercial fisheries are the backbone of many of our coastal communities. These coastal communities rely on fishing not only as a major component of their economy but also as an important

part of their culture. In 2000, the Maine Department of Marine Resources (DMR) issued approximately 18,000 commercial fishing licenses to either individuals (self-employed fishermen) or to boats with crews.

However, many of the fishery resources in the Gulf of Maine that Maine fishermen depend on are considered over harvested, while others are fully exploited at current levels of fishing effort. Landings of some groundfish stocks are just beginning to see signs of recovery after a collapse in the fishery in 1995. The sea urchin fishery continues to experience declines in landings and the days allowed for harvesting have been reduced dramatically. Lobster landings have experienced record catches in recent years with Maine landing over 50 million pounds in 1999 compared to the 20-year average of 20 million pounds. However, the recruitment of new lobsters into the population remains a major concern for scientists and managers. Even Atlantic herring, which is an underutilized resource throughout its entire range, may be over harvested on individual spawning grounds in the Gulf of Maine in the summer and fall. Concurrently, the development of new markets has led to the emergence of a number of new fisheries in the last few years (e.g., sea cucumbers, whelks).

Maine continues to explore new ways to manage our fisheries so that they will provide a sustainable resource for our coastal communities. Government officials, industry members, scientists, conservationists and others continue to question the effectiveness of current management schemes and look for new management alternatives. In 1995, the Maine Legislature took a bold step and enacted legislation to dramatically alter the way conservation and management decision were made about the lobster fishery. This legislation transferred some decision-making authority from the state to area lobstermen who have been recognized for their stewardship of the lobster resource. Management efforts continue to focus on the development of alternative approaches in other fisheries that encourage users of the resource to be responsible stewards.

Existing Threats or Conflicts —

- Many commercial fisheries in the Gulf of Maine are overharvested (e.g., ground fish, scallops), while others are fully exploited at the current level of fishing effort. This decline in fisheries threatens the structure and function of the Gulf of Maine ecosystem (i.e. different species dominating the system) and the economic vitality of our coastal communities. As the pressure on Maine's marine resources continues to increase it is even more essential to carry out the necessary research to determine how to maintain a sustainable resource base.
- Limited entry in many of Maine's fisheries has created a system that is inflexible because it does not allow easy movement between fisheries. Traditional fishing practices allowed for fishermen to move between fisheries as available resources changed. The entry restrictions at both the federal and state level are having a negative impact on the health of Maine's marine businesses and coastal communities.
- The complexity of fisheries management is creating conflicts among local, state, interstate and federal fisheries management programs. Whereas the federal approach has focused on limiting participants and resource allocation, the state approach has tried to balance resource and community needs through local input. Within the state, however, the multiple advisory bodies

and policy boards has caused the state management process to become complicated and often in discord with federal and interstate management plans.

- ✍ Lack of knowledge of species ecology sometimes results in management measures that come too late, are inappropriate, or overreaching. Almost always, this lack of knowledge leads to lengthy, and very heated debates over fishery issues.

Anticipated Threats or Conflicts —

- ✍ Coastal development has limited access to Maine's waters for fishermen and aquaculturists. Although many fishermen have moved their residences inland, they will always need access to the water to stock their boats with fuel, ice, bait and equipment and to land their catch.
- ✍ The increased pressure on near shore fisheries may threaten these fish stocks, other marine organisms and near shore habitats. The protection of near shore habitats, which serve as spawning and nursery grounds to many fish species, is seen as a key component to rebuilding many of Maine's commercial fisheries.
- ✍ Dredging can impact anadromous fish migration by increasing suspended sediments in coastal rivers and affect the quality of the marine habitat. Activities associated with dredging can also interfere with resource harvesting, such as lobstering, if the project is not properly planned and managed.

Marine Habitat Protection

Maine's cold marine waters are some of the world's most productive. One of the challenges to managing and protecting the habitats of important flora and fauna is the difficulty in understanding the complex and dynamic nature of marine ecosystems. The habitat requirements of any given species can change dramatically over the course of its life. For example, the early life stages of the lobster are planktonic, subject to ocean currents and other environmental factors. Juvenile and mature lobsters are bottom-dwellers. Yet, there is much that we do not know about the life process of the lobster and other marine organisms and how susceptible they are to varying coastal conditions.

Studies of several bays in Maine in recent years present an excellent opportunity to look at marine habitat protection in nearshore ecosystems. Results of the Nature Conservancy's Cobscook Bay project, the Penobscot Bay Marine Collaboration and the work in the Casco Bay Estuary help provide a foundation for the next step of determining the patterns of distribution of organisms along the coast and how that information should inform management decisions.

The recent Presidential Executive Order calling for the protection of marine areas has increased the debate about the best way to conserve marine resources. Conservationists embrace the idea of establishing a system of marine protected areas that would limit use, while fishermen see it as yet another in a long list of regulations. The lack of a scientific and ecological framework for looking a at marine resources and determining the need for such protection has only increased the conflict between conservationists, managers and fishermen.

Threats or Conflicts —

A variety of activities can impact marine habitats:

- the proliferation of docks can shade valuable aquatic vegetation;
- dredging projects can both disturb important habitats at the site of the dredge and at the disposal site;
- bridge construction;
- dam construction and removals alter habitats both above and below the project site;
- oil spills and chemicals can disturb aquatic and intertidal habitats;
- poorly management netpen aquaculture can alter the bottom habitats under the site;
- fishing gear can impact benthic habitats;
- wastewater discharges, point and non-point, can dramatically affect habitats;
- lack of uniform procedures and guidelines for the assessment of marine habitats along the coast leads to unequal protection of habitat types;
- scientific rigor in the designation of essential fish habitat is lacking due to major gaps in information and is creating potential conflicts among marine resource managers, scientists and users;
- impact of marine uses such as certain types of fishing gear, disposal dredge spoils, impacts from aquaculture;
- eutrophication of harmful algae blooms in shallow, poorly flushed embayments; and
- oligotrophication of rich productive areas.

Competing Uses of Public Waters

Maine's marine waters and the land beneath, from the low tide mark out to three nautical miles, are public resources owned by the people of Maine. Under the public trust doctrine, the public has the right to fish, hunt, navigate, swim, and otherwise enjoy customary and traditional uses of the submerged lands and the waters over them. Increasing activity among seaweed harvesters has raised questions regarding public and private property rights and highlights the need to address user conflicts.

The Maine coast continues to change from marine trade-based, communities to tourism and service-based related communities. Changing land ownership along the coast is creating a different ethic among private coastal landowners. Whereas Maine's coastal residents historically supported commercial fishing activities in the intertidal and subtidal zone, a growing number of landowners are voicing opposition to these activities within their view.

With over 3,500 miles of coastline and approximately 2,800 square miles of state waters, Maine's coastline is traveled by thousands of commercial and recreational boaters each year. During the summer months, coastal bays and estuaries are alive with boaters. Recreational saltwater fishing has grown exponentially in the past 10 years, from 136,000 anglers in the early nineties to 370,000 participants in 1999. These activities are becoming a larger contributor to the economic base of coastal communities. As this recreational sector continues to grow, potential conflicts with users of the public resource will become an even greater component of ocean resource management.

Existing Threats or Conflicts —

- ✍ Issues surrounding ownership and use of intertidal lands for seaweed harvesting will continue to be a source of conflict for ocean resources management. The lack of clarity on this issue will continue to overshadow the current efforts to develop a viable seaweed harvesting sector.
- ✍ Demand for mooring and dock space for recreational boats has outstripped supply in much of the coast. This increasing demand competes with anchorages for commercial vessels.
- ✍ Coastal development has limited access to Maine's waters for fishermen and aquaculturists. There are currently no public programs specifically focused on providing boat landing facilities for commercial fishermen. Commercial access is a critical issue that needs to be addressed if fishing is to remain a viable Maine industry.
- ✍ Coastal development has restricted both traditional fishing and aquaculture due to conflicts over land and water use. Noise of diesel engines starting early in the morning, fish odors, commercial trucks, and fishing equipment and activity in sight of coastal homes are the primary sources of conflict.
- ✍ The cost of doing business for fishermen has increased primarily through waterfront real estate taxes that reflect rising land values. Some fishermen have cited tax increases as high as 300%, as their properties are taxed for the "highest and best use." Other increased costs include trucking boats, traps and equipment to inland sites for service and storage, as shorefront sites become too expensive to maintain.

Anticipated Threats or Conflicts —

- ✍ Competition between users of the water is likely to increase as recreational and commercial markets expand. For example, rising recreational boat traffic may conflict with other uses such as aquaculture and commercial fishing.

Ocean Disposal of Dredged Materials

There are currently 70 federal navigation projects in Maine and many privately maintained anchorages. U.S. Army Corps of Engineers (USACE) has dredged port and harbor areas in over 50% of Maine's coastal towns, and numerous other coastal towns have private dredging projects.

From 1997 to date, the ACE has conducted or expects to conduct the following seven maintenance dredging projects in Maine: Kennebec River (twice), Portland Harbor, Scarborough River, Royal River, Wells Harbor, and Union River. USACE completed maintenance dredging of the most significant of these projects, Portland Harbor, in 1999. MDOT anticipates that maintenance dredging of the Rockland Harbor, Belfast Harbor, Camden Harbor, and Narraguagus River projects may be completed during the next two to three years.

When these facilities are maintained, the dredged material is either used for some beneficial use, deposited on land, deposited in a designated ocean disposal site, or deposited in a permitted near-shore disposal site. Yet there are limited beneficial uses for this material and the cost of land disposal can be very high, so ocean sites are often relied on for disposal. Disposal of the material between 1950 and 1989 occurred as follows: ocean sites - 41%; estuarine sites - 36%; upland sites - 15%; unidentified -

8%. The only ocean disposal sites designated and approved by EPA are located near Portland and Rockland. Another site off Cape Arundel has received interim approval by EPA.

The Maine Department of Transportation has integrated prioritization of, and planning for, the maintenance dredging needs of federally maintained navigation channels and harbors into its overall, intermodal transportation planning process. Recognizing the potential for resource conflicts; the need to identify, quantify and plan for the anticipated needs for disposal of dredged material from federal, state and private projects; and the potential for improvement of the State and federal regulatory review process applicable to coastal dredging projects, MDOT initiated preparation of a Dredging Management Action Plan (DMAP) in 1999. MDOT has involved a diverse and representative group of public and private stakeholders in the development of the DMAP. MDOT expects the plan to be completed in November 2001 and presented to the State's Land and Water Resources Council for its review and endorsement. It is anticipated that the Maine Legislature would consider recommendations requiring legislative action, if any, in 2002.

- ✍ Reliance on ocean disposal can be an environmental problem when sediment dredged from channels and harbors is contaminated with pollutants such as PAHs, PCBs, and metals. Moreover, dispersing pollutants into marine waters through dredging can cause ecological problems in areas near the dredge.
- ✍ Maine has only a few approved sites for ocean disposal of dredged materials. The Portland Ocean Disposal Site is the only ocean dumping site in or adjacent to Maine waters that is formally designated under the Ocean Dumping Act (ODA). Many projects in Maine are located too far from this site for its use to be economical. Due to fisheries concerns, the State requested that EPA and USACE suspend efforts to formally designate the Cape Arundel disposal site (CADS), serving Maine's south coast, as an ODA- approved site. CADS, which had interim approval from EPA, remains available for use until 2003, with an option to extend its use until 2008. The Rockland disposal site serves Maine's midcoast ports. There are no designated sites in Maine's more easterly waters.

- ✍ Growing demand for marina facilities and expansion of commercial ports will require more attention to beneficial use or disposal sites for dredged material.

State Ocean Management Programs and Initiatives Developed Since 1997

Program	Status	CZMA 309 Funds
statewide comprehensive ocean management statute	no	
statewide comprehensive ocean management plan	no	
single purpose statutes related to ocean resources	yes	
statewide ocean resources planning/working groups	yes	yes
regional ocean resources planning efforts	yes	
dredging/maintenance planning	yes	
submerged lands planning	yes	
harbor management planning	yes	
habitat planning	yes	yes

Marine Fisheries Management

Controlling Management of Emerging Fisheries — An Act to Establish a Framework for Management of Emerging Fisheries (Public Law 1999 Chapter 297) was signed by Governor King on May 24, 1999. This innovative law grants new authority to the Commissioner of Marine Resources to require an endorsement on a license, in conjunction with a commercial fishing license, in the event of a new or emerging fishery. The Commissioner may attach such terms and conditions to participation as are necessary for the orderly development of the fishery. This first step is a means of initiating management at an early stage of development to avoid exploitation of the fishery beyond a sustainable level. Once the Commissioner evokes the authority of the statute, the Department must report to the Legislature within two years on the condition of the fishery and what management measures should be implemented. This law has already been used in the development of regulations to manage the emerging sea cucumber fishery.

Developing a Maine Fisheries Research Agenda — In 2000, the Department of Marine Resources, in cooperation with the Gulf of Maine Aquarium and Maine Sea Grant, sponsored a series of forums with fishermen, academics and managers to develop a shared research agenda for marine fisheries. The process was overwhelmingly successful and developed specific research projects. Two common research foci emerged from the meetings: 1) the need to better understand nearshore oceanographic processes and 2) the need to understand larval and juvenile growth of species and the impact of various environmental conditions on species. In addition, the scientific research process should be collaborative and build on previous work. These priorities overlap with several coastal priorities, including habitat protection, water quality and maintaining healthy ecosystems.

Evaluation of Co-management Approaches to State Fisheries Management — In March of 1998, an all-day workshop was held at the Maine Fishermen's Forum to: 1) assess what progress has been made in new approaches to fisheries management, specifically in the soft-shell clam, sea urchin, and lobster industries; 2) share experiences and discuss issues that will need to be resolved as we move forward; and 3) explore ideas on how Maine can continue to develop and implement a co-management approach to managing our fisheries. A briefing paper about current co-management efforts in Maine was completed as a background piece for the meeting. Over 150 people participated in the workshop including fishermen from several different fisheries, state and federal fisheries managers, fisheries scientists, university researchers, members of nonprofit conservation organizations, state legislators, and members of the general public with an interest in fisheries management issues.

Lobster Zone Management Councils — Maine's seven Lobster Zone Management Councils meet monthly for nine months each year. All seven zones voted in 1998 and 1999 to restrict the number of traps within their zones and the Department of Marine Resources adopted regulations to formally implement these changes. Currently, five zones are discussing limited entry by establishing exit ratios. Regulatory changes regarding lobster zone management will continue throughout the near future as adjustments are made to the program.

Limiting Effort in the Lobster Fishery — Marine Resources' staff worked over the past four years with the Lobster Advisory Council as they discussed additional management options for the lobster fishery. The Council was successful in developing four pieces of legislation that were passed in 1999, primary among them is a limited entry approach on a zone-by-zone basis. This new legislation has dramatically affected the lobster zone. The laws address the following: 1) allowing zones to recommend limited entry by establishing a ratio of new participants to retiring participants; 2) limiting the number of lobster trap tags an individual is able to purchase to reduce trap buildup; 3) establishing a licensing appeals process; and 4) clarifying the student license criteria. The DMR has proposed and adopted regulations to comply with these new lobster laws.

Monhegan Conservation Area — In 1998, the Legislature passed legislation that formally established the Monhegan Conservation Area. The Monhegan Conservation Area, among other restrictions, has a limited season and lower trap limit than the rest of the state. Entry into the Area is initially limited to the number of individuals from Monhegan who traditionally fished in that region. The Legislature recognized that this new legislation would raise many issues for the current seven lobster zone policy councils along the coast. To address some of these potential concerns, the Monhegan legislation also established a Task Force to study the use of subzones.

Subzone Task Force — A 13-member Task Force met over the summer and fall of 1998 to study the use of subzones as a management tool within the context of the current seven Lobster Zone Management Councils. Issues related to subzones, including but not limited to, exclusive access in those subzones to the lobster resource and the relationship of the subzones to the existing Lobster Zone Management Councils were discussed. The Task Force also examined the benefits and risks of establishing the subzones. The report provides clear guidance to the Legislature and others on the complicated issue of subzones. During its deliberations, the Task Force discussed several concerns

about whether other subzones should be allowed, whether exclusive access to the lobster resource should be granted in subzones and how these areas relate to Maine's seven Zone Councils. The Task Force weighed the benefits and risk of subzones and concluded, by consensus, that subzones should be discouraged at this time.

Researching Marine Jurisdiction and Governance — In January of 1998, a report titled *State Fisheries Jurisdiction in the Gulf of Maine: A Legal and Policy Analysis* by Professor Alison Reiser was printed and distributed to members of the state Marine Resources Committee, Maine's delegation to the New England Fisheries Management Council and Atlantic State's Marine Fisheries Commission, and other interested parties. This report provides an excellent and comprehensive analysis of state and federal fisheries jurisdiction issues. A second report titled *Governing Maine's Fisheries* by Jim Acheson, Jim Wilson and William Brennan of the University of Maine at Orono was completed in March of 1998. This report covers the broad area of fisheries governance and contains several useful appendices covering limited entry in other states, public trust issues and co-management in other countries. The appendices have been used individually to provide information in these areas for discussions among the industry and the legislature.

Limited Entry in the Shrimp Fishery — Department of Marine Resources staff worked with a legislative task force and completed a report that discussed options for limiting entry in the shrimp fishery. The Legislature's Marine Resources Committee met on January 18, 2000 to discuss the final report on limited entry into the shrimp fishery. Legislation was written based upon this report but, as a result of public comments, no legislation was passed. Discussions regarding limited entry in the shrimp fishery will continue in the coming year as the Northern Shrimp Management Section of Atlantic States Marine Fisheries Commission (ASMFC) discusses changes to the ASMFC Shrimp Management Plan.

Marine Habitat Protection

Habitat Identification — The Department of Marine Resources has pursued an ecosystem approach to habitat identification and protection. By using sea bottom profilers such as RoxAnn, DMR is mapping marine habitats in several bays along the coast -- Saco, Sheepscot, Penobscot and Casco --and linking those habitat types with assemblages of fish species. Identifying fish assemblages associated with particular habitat types (sand, gravel, mud, etc.) assists in understanding how the habitat functions within the marine ecosystem. This approach differs from the traditional approach of looking at habitats on a species by species approach. DMR is developing an Internet mapping application to display this information.

Assessment Methodologies and Guidelines — The Department of Marine Resources continues to update and monitor eelgrass communities in Maine. This habitat type is particularly vulnerable to oil spills, motorboat traffic, shellfish dragging, and coastal development. A DEP project to develop assessment methodologies and guidelines for marine habitats provided educational material to developers and coastal property owners on the value of various intertidal habitats. Methods were developed for applicants to use in the Natural Resource Protection Act permitting process.

Gulf of Maine Ocean Observing System — The establishment of a Gulf of Maine Ocean Observing System presents a tremendous opportunity to improve our understanding of the dynamics of near shore ecosystems, inform decision-making and to monitor the health of marine ecosystems. Over half of the buoys will be located in near shore locations, providing real-time and archived data on a suite of oceanographic parameters. The challenge will be to determine how to best use this system of buoys to collect information that will be useful to coastal management.

Gulf of Maine Regional Planning — Maine is a member of the Gulf of Maine Council on the Marine Environment - an international organization of three states and two Canadian Provinces dedicated to improving the environmental health of the Gulf of Maine. In 2000, the Council reviewed and updated their 10-year Action Plan to define priorities and objectives for the Council. The current plan addresses these habitat issues: restoring shellfish habitat; protecting and restoring fishery habitat and resources; protecting human health and ecosystem integrity from toxic contaminants in marine habitats; protecting and restoring regionally significant coastal habitat; and reducing marine debris.

Competing Uses of Public Waters

Investigating Coastal Landowner Concerns — A report was completed in January 2001 to begin exploring the issues surrounding commercial use of near-shore waters and the potential impact these uses may have on coastal property owners.

Ocean Disposal of Dredged Material

Dredging Disposal Needs — The Army Corps of Engineers prepared a study in 1994 that projected the future need for disposing dredged material from federal navigation projects. The study also began an analysis of possible ocean disposal sites that could be developed. The DMAP project, discussed above, is using this and other information in developing a plan for addressing the State's dredging needs more efficiently.

Significant Impediments to Managing Ocean Resources

Fisheries management structure — The current approach to fisheries management does not always consider sustaining fish populations in the context of maintaining a viable fishing industry. Decision making is often perceived to be too centralized without adequate involvement of fishermen and scientists, which creates distrust in the ability of State government to make sound management decisions. New alternatives to cooperatively manage fisheries need to continue to progress. However, there is also growing concern that the state management system does not allow for adequate discussion of inter-species coordination, interstate and federal concerns, and discussion of broader fisheries policy issues.

Information on marine ecology — The State lacks sufficient information on its marine ecosystems to identify and protect sensitive and threatened marine habitats. With limited funds for this research,

scientists, fishermen and government officials must work together to improve our understanding of the function and value of these habitats.

Competing uses of coastal access sites and marine waters — Maine does not have a forum to discuss all issues surrounding the private and public uses of submerged and intertidal lands. This need will increase as uses of marine resources increase, especially private exclusive use of marine resources and their surrounding waters.

Public outreach and information — A well informed public is essential to support management of marine resources. The State does not have funds to maintain an active outreach campaign that continually informs the public about marine resource issues and engages them to help develop new solutions.

Strategies

✍ *Ocean Governance Strategies*

1. Develop a Comprehensive State Plan on Scallop Management and Enhancement

Fisheries management issues are most often complex and controversial. Therefore it is important to begin planning for the future of Maine's fisheries with those who are invested in them. In recent years, the state has taken a proactive approach to gaining industry advice and support during the development of management plans. The institution of lobster management zones has made an initial step at a new paradigm for Maine's marine resource management. Through this cooperative management approach, we are learning how to create management tools that are sensible both biologically and socially. As a result of these kinds of arrangements, fishermen are better able to maintain their historic stewardship of their resources. The scallop fishery is one area with the potential to experience major improvements if scientists and managers can work with the industry through a cooperative approach.

a. Proposed program change --

Legislation and/or regulations to better manage the scallop resource. This management plan will be developed through a cooperative approach with the fishing industry and will assist the fishery in becoming a sustainable resource.

b. Describe why the activity is the most appropriate means to address this issue --

It has been acknowledged that cooperative approaches to management can result in better management decisions. The co-management approach to decision making fosters a stewardship ethic and creates a system for better communication between the state and the fishing community. This program change is most appropriate because it involves a broad group of stakeholders in the development of the management plan. The people affected by the changes in management are part

of the management process, which will result in better regional and statewide decisions for both the resource and Maine's coastal communities.

c. General work plan --

Task	Date
Establish a Commissioner's ad-hoc work group for scallop management; conduct series of discussions with fishermen, scientists, managers and others to solicit ideas and to generate agreement on a work plan for the project; review previous management strategies; new initiatives; discuss potential management structures	July 2001 - January 2002
Draft management plan; revise; distribute for comments	January 2002 - July 2002
Draft legislation and/or regulations as necessary	July 2003 - January 2004
Implement management plan	July 2004 - July 2005

d. Summary of Costs --

	FY2001	FY2002	FY2003	FY2004	FY2005
DMR staff	$30,000	$30,000	$30,000	$30,000	$30,000
Other (mailings, printing, etc.)	2,000	2,000			

e. Likelihood of Success --

High

2. Evaluate the Structure of State Fisheries Management and Explore Options

Local, state, interstate and federal fisheries management activity has increased dramatically in recent years due to the continued threat of decline in certain stocks and the desire to development sustainable fisheries. These management decisions are often complex and require considerable expertise in both fishery science and policy development. The Marine Resources Committee and the DMR Advisory Council guide Maine's state fisheries management policy through their legislative and regulatory decisions. However, the deliberation of both of these groups is most often in reaction to a proposed piece of legislation or regulation with limited time for in-depth discussion, planning and policy development. Therefore, the interplay between local, state, interstate and federal fisheries management processes is often not in sync.

Implementation of management plans developed at the interstate or federal level is usually contingent on state legislative or regulatory action. Whereas management measures are principally developed through statute, the potential delay and uncertainty of the legislative process prevents effective action. This is particularly true for Maine where the legislature meets for only a limited period time of the year. The emerging system of fishery-specific advisory committees is also creating less of an integrated approach to fisheries management and management of the marine ecosystem as a whole. In order to effectively manage Maine's marine resources, it may be appropriate to evaluate the effectiveness of the current

state management structure and look elsewhere to see if there are other models that may be applied to Maine.

a. Program change --

Evaluation of existing state fisheries management structure and potential legislative changes to implement a new structure. A thorough analysis, evaluation, and discussion of the current structure of Maine's fisheries management decision-making bodies will be conducted and a determination will be made, through a public process, to determine if changes to the current structure are necessary to more effectively manage the state's marine resources.

b. Describe why the activity is the most appropriate means to address this issue --

The nature of fisheries management decisions has changed dramatically in the last decade. The complexity of the management issues is forcing decision-makers to face an increasing number of critical issues on a weekly basis. Previously, decisions were less complex and a monthly or annual timeframe was adequate. In addition, the new co-management approach to many fisheries has not contemplated how these local decisions should be best integrated into the overall state marine policy and management plans. It is appropriate to review and evaluate the effectiveness of our state management structure at this time.

c. General work plan --

Task	Date
Design and planning stage: review existing state management structures; draft "white paper" on issues and options	July 2001 - January 2002
Conduct series of roundtable discussions with fishermen, scientists, environmentalists, managers and others to solicit ideas and to generate agreement on issues identified and options suggested; revise and add to working "white paper" document	January 2002 - June 2003
Conduct second series of roundtable discussions, meet with state leadership, build consensus on best option for Maine	July 2003 - January 2004
Draft legislation and other policies as needed to implement best option	January 2004 - July 2004
Implement new state management structure (if needed)	July 2004 - July 2005

d. Summary of costs --

	FY2001	FY2002	FY2003	FY2004	FY2005
SPO/DMR staff	$30,000	$30,000	$30,000	$30,000	$30,000
Contractual/Other	15,000	10,000			

e. Likelihood of success --

Moderate

3. Engage in Collaborative Research

Fisheries research funding has been promoting the active participation of members of the industry in both developing the research agenda and carrying out the needed research. The fishing vessels left idol from reduced days at sea and other restrictions can serve as a useful platform for researchers. It is important that the state continue to explore collaborative research in terms of priorities, evaluating our experiences to date, and learning how to bring ideas to reality. There are many issued yet to be resolved including: data management (short-term, long-term), compensation (fishermen, boat time, etc.), data confidentiality, issuance of experimental permits, roles and responsibilities of partners (experimental design, who does what, etc.), logistics (timing of research, weather conditions, etc.).

✍ *Marine Habitat Strategies*

These strategies are intended to raise public awareness of marine habitat protection; continue the collection of information on subtidal habitats; and develop the management measures necessary for their protection.

1. Review and analyze the data contained in the Finfish Aquaculture Monitoring Program (FAMP) to determine impact of finfish aquaculture on benthic habitats. (see aquaculture strategy Number 1)

2. Create framework for progress on Marine Protected Areas.

a. Program change --

Create a framework for the potential identification of marine protected areas based on scientific and ecological principles and information. Existing scientific information on Maine's marine environment will be categorized using an ecological principles to identify major "seascapes" or "ecosystem types." This ecological framework will provide the basis for a process for determining the need for protection and priorities. Based on this framework, a selection process will be developed and tested in a pilot region of coastal Maine.

b. Describe why the activity is the most appropriate means to address this issue --

Most of the work concerning marine protected areas in the Gulf of Maine region concerns legal, jurisdictional and policy considerations. Little work has been done to organize scientific information into a framework that can inform management decisions. This project will gather scientific information and organize it according to ecological principles to assist with selecting sites.

c. General work plan --

Task	Date
Design and planning stage: review literature on marine areas, conduct series of roundtable discussions with fishermen, scientists, environmentalists, managers and others to	July 2001 - July 2002

solicit ideas and to generate agreement on a work plan for the project.	
Compile existing scientific information into ecological framework that identifies “seascapes” or “ecosystems” to form a map of the ecological regions in the Gulf of Maine	July 2002 - July 2003
Identify pilot area to develop selection methodology for marine protected areas.	July 2003 - 2004
Finalize a methodology to selection of representative areas for protection.	July 2004 - July 2005

d. Summary of costs --

	FY2001	FY2002	FY2003	FY2004	FY2005
SPO staff	$12,000	$12,000	$12,000	$12,000	$12,000
DMR staff	5,000	10,000	20,000	20,000	20,000
Contractual	10,000	40,000	20,000		

e. Likelihood of Success --

High

3. Review data from the Gulf of Maine Ocean Observing System to determine how the information can be used to improve our understanding of nearshore ecosystems, marine habitats and how the system could augment existing coastal monitoring efforts.

Data from the GoMOOS buoy array will be analyzed and presented to a workshop of scientists, state and local managers and others to determine how to best use this information in monitoring efforts and to better inform decisions made about coastal resources.

4. Develop policy guidelines for the consideration of marine habitats in permit decisions.

In 1998, DEP developed a methodology for the review and critique of coastal development projects' potential impact on marine habitats. This work needs to be expanded to include impact on benthic habitats and policy guidelines developed to guide how marine habitats are considered in the permit review process.

a. Proposed program change --

Policy guidelines for the consideration of marine habitats under the Natural Resources Protection Act and the Site Location of Development Act. The policies will establish criteria for how permit reviewers should consider the impacts on marine habitats from a given activity and the kinds of actions that could be adopted to minimize those impacts. In addition, assessment methodologies will be developed for benthic habitats.

b. Describe why the activity is the most appropriate means to address the issue --

This project builds on the work done by DEP to develop marine habitat assessment methodologies by giving clear guidelines on how to interpret those assessments.

c. General workplace --

Task	Date
Organize a steering committee of permit reviewers and scientists	July 2003
Develop threshold standards and policy guidelines for permit reviewers	November 2003
Present guidelines for formal adoption by DEP	March 2004

d. Summary of costs --

	FY2003
Staff time	$12,000
Contractual	10,000

e. Likelihood of success --

Low

✍ *Competing Uses of Public Waters*

Maine's coastal communities are experiencing the pressure of new development and competing marine resource needs that have long been an issue for more developed states. These multiple uses will continue to grow if the economy remains strong. Following are potential strategies to address this issue:

- ✍ A more thorough assessment of changes in coastal land use and increasing values of waterfront properties should be completed.
- ✍ Review Right to Farm Laws and explore the possibility of developing similar guidelines for mitigating conflicts and complaints concerning waterfront use.
- ✍ In the fall of 2000, a referendum question to provide for current use taxation for commercial fishing use of waterfront property was narrowly defeated. An assessment of the level of industry support for initiating a new current use taxation referendum question should be explored. Depending on industry support and other factors, the state should consider putting resources into educating the public about the reason and importance of this change.
- ✍ Support Small Harbor Improvement Program (SHIP) bond legislation.
- ✍ Proactively seek public water access sites in high priority areas and assist local entities with acquisition and improvements.

✍ *Dredged Material Management Strategies*

As noted in the assessment, Maine needs to plan for the use or disposal of dredged material that cannot be disposed at the Portland disposal site. There are many projects that are located too far from this site that have used ad hoc disposal areas that may not be available in the future. Moreover, contaminated

sediment may not be disposed at sea, which presses the need for new disposal methods for projects such as Portland Harbor. Finally, Maine needs better information on the presence and needs of fisheries that are affected by dredging in order to set better guidelines for timing of the dredge.

- ✍ The State should complete the DMAP process and implement environmentally and economically sound steps to plan for and efficiently address the State's coastal dredging and disposal needs.
- ✍ Conduct research in places where dredging is expected to identify the presence and needs of fisheries and productive habitat areas that may be impacted by dredging.

AQUACULTURE

Aquaculture is the controlled cultivation of aquatic plants and animals during all or part of their life cycle for either commercial purposes or the enhancement of wild stocks. As an emerging industry, aquaculture production has grown significantly in Maine over last 20 years, but has grown more slowly than in other parts of the United States and the world.

Assessment

Types of Aquaculture in Maine

Aquaculture remains one of the state's most valuable marine resource industries. In 1998, the farm-gate valued of Maine aquaculture products was estimated at nearly $70 million. Atlantic salmon accounts for over 90 percent of this value ($68 million) with oyster and mussel culture valued at $1.8 million. The industry employs over 1,000 people. The salmon, oysters and mussels are raised on 1,200 acres of marine land and waters leased from the State by private companies. Salmon operations are concentrated in Cobscook, Machias, Pleasant, and Narraguagus Bays in Downeast Maine. The shellfish industry is largely concentrated in the Midcoast area. The cultivation of seaweed is occurring at a limited scale in Cobscook Bay.

Existing Threats or Conflicts

While aquaculture is still championed as one of the State's most promising growth industries, a variety of problems trouble the industry:

- The listing of Atlantic salmon as an endangered species by the United Stated Department of the Interior will affect the salmon aquaculture industry, particularly those companies with operations located near any of the seven salmon rivers. New 'best management practices' and other management measures required as part of the listing may be detrimental to the industry. Most experts expect to see an increase in lease applications west of Washington County, away from the salmon rivers, into the more populated areas of the State. Some experts believe that the major effect of the listing will be to discourage capital necessary to support the industry.
- The Department of Marine Resources (DMR) is considering enacting a moratorium on lease applications because of the tremendous backlog. Extreme demand for leases has overwhelmed staff at DMR and postponed the development of rules to implement the new permit-by-rule provisions of the lease law.
- Public concern about the expansion of aquaculture along the Maine coast is at an all time high as the result of several controversial lease applications. If more salmon farms seek new sites in the more populated mid-coast region (away from the downeast salmon rivers), this concern is likely to grow. Public concerns include protection of the marine environment, the size and scale of operations, aesthetics and the potential impact on the value of coastal properties. Some of these concerns stem

from unfamiliarity with aquaculture and the leasing process, and frustration that individuals and municipalities have little influence over where and how aquaculture will develop in the State.

- ✍ Potential eutrophication of coastal embayments as a result of aquaculture remains a concern. For the last fourteen years, DMR has administered the Finfish Aquaculture Monitoring Program (FAMP) that monitors the impacts on habitat and water quality directly under the lease site. Only recently has the State begun studying the impact of finfish aquaculture on the water quality of an entire bay or ecosystem. This issue is routinely raised in public hearings.

Anticipated Threats or Conflicts

- ✍ Several federal agencies such as Army Corps of Engineers (ACOE), Environmental Protection Agency (EPA), NOAA, and United States Department of Agriculture (USDA) are redefining their roles in managing aquaculture. For example, EPA is currently writing regulations to implement NPDES permits for aquaculture operations in Maine. The State of Maine will have to monitor these developments and work these agencies to ensure a coherent and effective regulatory program for aquaculture that avoids duplication and delays.
- ✍ The spread of disease both within cultivated species and to wild stocks remains a concern to aquaculturists, environmentalists and fish health experts. The issues involve both the health of the cultivated and wild species and the introduction of antibiotics and other medicines into the marine environment. As aquaculture expands to more areas along the coast this issue will likely increase in importance.

Accomplishments in Management of Aquaculture

Maine developed and adopted a *Strategic Plan for Aquaculture* in 1997 that outlined actions that would enable the growth and development of both finfish and shellfish aquaculture in the state. DMR has successfully implemented a major recommendation of the Plan by increasing staff capacity to address policy and fish health issues. Through CZMA Section 306 funding, Maine's Aquaculture Lease Law was revised to create provisions for experimental leases and permit-by-rule standards for aquaculture equipment. These leases are designed to encourage new entrants into the industry via a streamlined approach for small-scale (2 acres), short-term (2 years) activities. This action has been successful: applications for experimental leases have doubled in the last two years. Unfortunately, the demand for leases has outstripped DMR's ability to process the leases and may lead to a moratorium of lease applications.

The Maine Coastal Program is working with the Maine Sea Grant's Marine Extension Team (MET), DMR and the Maine Aquaculture Association to develop educational material about the types of aquaculture in Maine and the process by which leases are granted. This material will be used by the MET in their pre-hearing community information meetings. These meetings have proven effective in informing people about aquaculture and the lease process.

Strategies

✍ **Aquaculture Strategies**

1. Review the Finfish Aquaculture Monitoring Program and Revise Leasing and Monitoring Programs

For the last fourteen years, DMR's Finfish Aquaculture Monitoring Program (FAMP) has collected detailed records on all finfish operations in state waters. Extensive paper records on the feeding, stocking, mortalities and husbandry practices of all finfish operations in Maine's jurisdictional waters is supplemented by data from annual and semiannual on-site monitoring visits. While DMR uses this information to monitor current conditions, no retrospective analysis of the data has been conducted. An analysis of this data will provide quantitative and qualitative information about the long-term effects of aquaculture on benthic habitats, water quality and other ecological parameters.

a. Proposed program change --

The review of this long-term data set will produce quantitative and qualitative information on the impact of finfish aquaculture on the marine environment and lead to recommendations to the aquaculuture lease program and the finfish aquaculture monitoring program. The review will help resolve a major public policy issue concerning the impacts of finfish aquaculture by providing industry representatives, coastal managers, riparian owners and concerned citizens with usable information about the long-term impacts of aquaculture in Maine. This information will form the basis for a series of recommendations for how to improve management of aquaculture in Maine.

b. Why the activity is the most appropriate means --

Much of the scientific information about the impacts of finfish aquaculture comes from studies done in areas other than Maine. The review will examine the actual data about Maine's finfish farms. This review will look at the impact of aquaculture within the context of Maine's management system and unique environmental conditions.

c. General work plan --

Task	Date
Data management; paper and video data will be converted to electronic format and entered into DMR's new electronic biological data base; electronic reporting forms will be developed to automate the monthly report procedure.	July - December 2001
Scientific review and policy recommendations; an advisory committee will oversee the review of the data and develop policy recommendations - this will include a review of the current scientific and management literature, assessment of the data and policy recommendations.	Dec. 2001 - Dec. 2002
Implementation of policy recommendations	Dec. 2002 - Dec. 2003

d. Summary of costs --

	FY2001	FY2002	FY2003	FY2004	FY2005
Contractual	$75,000	$25,000			
Staff	DMR	DMR	DMR		

e. Likelihood of Success --

High

2. Develop and adopt regulations for the new permit-by-rule standards in the Aquaculture Lease Law

a. Proposed program change --

During the last session of the Maine Legislature, the Aquaculture Lease Law was amended to require the DMR to develop permit-by-rule standards for certain types of aquaculture equipment, and to allow shellfish farmers to deploy equipment, if they meet prescribed standards. These provisions will streamline aspects of the leasing process and thereby relieving some of the pent up demand for lease applications.

b. Why this activity is the most appropriate means --

The permit-by-rule provisions in the law can not be utilized until implementing regulations are developed.

c. General work plan --

Task	Date
Establish oversight committee with DMR, industry, Sea Grant, environmental groups and concerned citizens	July 2001
Develop draft rules	August 2001
Revise and develop final rules	September 2001
Submit rules for formal rule making process	October 2001
Rulemaking process complete, final rules adopted	January 2002

d. Cost estimates --

	FY2001	FY2002	FY2003	FY2004	FY2005
Contractual	$15,000				
Staff	DMR	DMR			

e. Likelihood of Success --

High

3. Develop recommendations for minimizing the off-site impacts of aquaculture

Most of the monitoring of aquaculture operations is limited to the lease site and does not usually examine the impact on the greater ecosystem. A nutrient study of Blue Hill Bay, the site of several controversial

lease applications, would be designed to determine how finfish aquaculture affects the nutrient budget of the nearshore ecosystem.

a. Proposed program change --

Develop new regulatory approaches to minimize the off-site impacts of aquaculture, including recommended changes for DMR's environmental monitoring program.

b. Describe why the activity is the most appropriate means --

To date, monitoring of the impact of aquaculture has been limited to on-site impacts. This study establishes the foundation for looking at broader impacts. Blue Hill Bay is a logical choice for this study because several leases have been granted in this area and more are pending. The study will provide data to inform future lease decisions. This study will include an analysis of data from the Gulf of Maine Ocean Observing System (GoMOOS) buoy in the Bay to determine 1) if the data can augment the information gained from the nutrient samples, and 2) how such information can be used in the environmental monitoring program.

c. General work plan and schedule --

Task	Date
Gather nutrient and analyze samples	June - December 2002
Interpret results and publish report	January - June 2003

d. Summary of costs --

	FY2001	FY2002	FY2003	FY2004	FY2005
Contractual		$80,000			
Staff		DMR	DMR		

e. Likelihood of success --

High

4. Streamline the regulatory process for aquaculture

In light of new federal roles, the state should review how its management approach relates to federal management and develop streamlined methods for working together cooperatively and efficiently.

a. Proposed program change --

A review of all the federal and state laws and programs affecting Maine aquaculture will be conducted in order to identify areas where the process could be streamlined to reduce redundancy and inconsistency. In addition, Maine will consider whether the aquaculture lease law should become one of the Maine's Coastal Program's core laws.

b. Why this activity is the most appropriate means --

Several federal agencies are currently reviewing their role in permitting, managing and monitoring aquaculture activities. These new roles will likely result in changes to existing programs, policies and regulations.

c. General workplan and schedule --

Task	Date
Review federal and state programs for aquaculture to identify areas where there are overlaps, inconsistencies and duplication	September - December 2004
Make recommendations to change Maine program, if necessary and desirable	January - March 2005
Work with the Maine Legislature to implement changes	ongoing

d. Summary of costs --

	FY2001	FY2002	FY2003	FY2004	FY2005
Contractual				$20,000	
Staff				DMR	DMR

e. Likelihood of Success --

Moderate

5. Develop new information tools for aquaculture planning and public outreach

✍ *On-line applications* -- Map the legal constraints to aquaculture using an Internet mapping system (IMS). Internet Mapping Applications (IMS) are powerful new tools that allow users to access information over the Internet, thus ensuring broad distribution of the information. An IMS application depicting the legal constraints to aquaculture will allow lease applicants, riparian owners, harbor masters, fishermen and coastal residents to quickly access data over the Internet concerning areas where there may be constraints to siting aquaculture (water classification, habitat areas, etc.)

✍ *Publications and workshops* -- The Maine Coastal Program will continue to work with the Maine Sea Grant Marine Extension Team and others to develop educational pamphlets and other material on different aspects of aquaculture. Topics could include: a guide for harbor masters in reviewing lease applications; a discussion of the potential impacts of aquaculture on nearshore ecosystems; and a guide to husbandry practices used for the culture of different species.

6. Research

✍ The Coastal Program will encourage research that explores the potential impact of aquaculture on adjacent coastal properties. Research could take the form of economic valuation, visual preference surveys, opinion surveys and focus groups.

COASTAL WETLANDS

Assessment of Coastal Wetlands in Maine

Maine State Law (Title 38 MRSA 480-B) defines coastal wetlands as "all tidal and subtidal lands, including all areas below any identifiable debris line left by tidal action; all areas with vegetation present that is tolerant of salt water and occurs primarily in a salt water or estuarine habitat; and any swamp, marsh, bog, beach, flat, or other contiguous lowland which is subject to tidal action during the maximum spring tide level...Coastal wetlands may include portions of coastal sand dunes."

The exact acreage of coastal wetlands in Maine is unknown, though it is estimated that as much as 25%, or 5 million acres, of the State is covered by wetlands. Coastal wetlands -- particularly narrow fringing marshes -- are underrepresented by the National Wetlands Inventory maps, the only consistent wetlands inventory for the State of Maine.

Resource Characterization

Status and Trends

Over the past decade, State and Federal regulations -- as well as a heightened awareness and appreciation by the general public about the value of wetlands -- have slowed actual coastal wetlands losses from development and fill. While there are still direct threats to the "footprint" of coastal wetlands (e.g., from culverts and sedimentation), the greatest impacts are from activities that occur elsewhere throughout the watershed. Development near coastal wetlands has increased in Southern Maine, resulting in a corresponding increase in non-point source pollution, the hardening of the upland edge, and habitat fragmentation.

Over the last several decades, inventories, regulations and acquisitions have been aimed at individual units (i.e., a particular cattail wetland or a salt marsh). Today, resource managers view individual wetlands as interconnected units, and acknowledge that it is important to protect and manage natural resources from a landscape or watershed level. Since the last 309 assessment, watershed or landscape-wide assessments, planning, and management efforts have increased substantially.

Description of Threats

Pollution and Development of Associated Uplands — State and federal regulations have slowed the actual loss of coastal wetlands to development and fill over the last decade. However, development in proximity to coastal wetlands has increased in Southern Maine, resulting to the increased effects of non-point source pollution, stormwater run-off, hardening of the upland edge, and habitat fragmentation.

There is little indication that the rate of population growth and development will slow substantially in the near future; therefore, pollution sources will likely continue to affect the health of our coastal wetlands and nearshore environments. Although the state has a shoreland zoning law that regulates activities within 250 feet of coastal wetlands, implementation varies among municipalities. Town boundaries rarely correspond with watershed boundaries, which makes planning and management at the watershed level difficult.

Direct and Indirect Threats to Coastal Wetlands

Threat	Significance
pollution	high
other: development on associated uplands	high
erosion	medium
channelization (hydrologic alteration)	medium
nuisance or exotic species	medium
freshwater input	medium
development/fill of wetlands	low

Erosion, Channelization (hydrologic alteration), Freshwater Input, Nuisance or Exotic Species — These four threats can be best characterized in the context of hydrologic alteration. Very few of Maine's coastal wetlands have escaped hydrologic alteration from ditching of salt marshes for salt hay production, tidal restriction caused by undersized or poorly placed culverts, or dredging.

Grid ditching, a historic remnant, is not a natural part of the coastal wetlands landscape; the ditches drain water away from what would otherwise have been pools in the high marsh. How to address these ditch systems is still in question and further study is required to determine what restoration steps will be most effective. Erosion and sedimentation cause problems for wetlands. Excess sediments are channeled into coastal wetlands by increased development and impervious surface in upland areas of the watershed. At the same time, too little erosion for nourishment of particular habitats occurs when the upland edge of those habitats has been hardened, thus reducing the source of the replenishing sediments. Any hydrologically altered marsh is at risk from invasive species, and Maine is experiencing an increased occurrence of *phragmites* in our coastal marshes.

Maine is restricted in its ability to adequately address all of these threats. There is a lack of knowledge regarding the interrelationships of the coastal wetlands and their related uplands, and there is no accurate assessment of both historic and current coastal wetlands, particularly the narrow fringing marshes.

Management Characterization

Wetlands Management Efforts

Changes in Wetlands Management since 1997

Management Category	Degree of Change
regulatory programs	moderate
wetlands protection standards	none
assessment methodologies	significant
impact analysis	none
restoration/enhancement programs	significant
SAMP	none
education/outreach	moderate
wetlands creation programs	none
acquisition programs	significant

Regulatory programs — The State adopted new storm water, erosion control and sedimentation laws which address new development of specific sizes. These regulatory changes were accomplished with CZMA Section 309 funds. Additionally, there have been improvements to the wetlands permit tracking programs at the Department of Environmental Protection. The new GIS tracking system will assist in permit analysis and wetland compensation efforts. This effort was funded with US Environmental Protection Agency resources.

Assessment methodologies — The Global Programme of Action Coalition for the Gulf of Maine (GPAC) funded the development of protocols for tidal restoration monitoring in the Gulf of Maine. These protocols were designed for the tracking of existing and potential salt-marsh restoration and reference sites, and for the evaluation of salt marsh restoration success. The US Fish and Wildlife Service Gulf of Maine Program will maintain the database that results from the use of this protocol. The Gulf of Maine Council on the Marine Environment has supported a proposal to fund a person to promote the use of these protocols throughout the Gulf of Maine.

The Maine Outdoor Heritage Fund Board and Gulf of Maine Council funded a project to inventory tidal restrictions in the Casco Bay Watershed and to organize and train volunteer monitors to assess the level of restriction at selected sites.

In collaboration with other state and federal agencies, the State Planning Office (using CZMA Section 309 and USEPA funds) designed a wetlands characterization method and applied it on a watershed scale in the Casco Bay region. This is a GIS-based assessment of likely wetland system attributes, functions, and values. The characterization results are assisting in the development of wetland protection strategies, both in regulatory and non-regulatory approaches. One of the most productive areas in which Maine expects the use of the characterization to improve wetland protection is in increased local efforts. The Greater Portland Council of Governments has helped to develop maps and materials for use by municipalities that explain and illustrate the results of the characterization. They have also provided technical assistance to towns that are interested in using the results of the characterization in their local planning efforts.

Maine Department of Inland Fish and Wildlife (MDIFW) and the Maine Natural Areas Program (MNAP) have initiated a new pilot program for coastal towns in southern Maine that focuses on open space and habitat planning. The agencies are working in collaboration with US Fish and Wildlife Service Gulf of Maine Program, Wells National Estuarine Research Reserve, Maine Audubon, Southern Maine Regional Planning Commission, and the Maine State Planning Office, which is coordinating the project. This initiative, which MDIFW has been researching for several years, represents a shift toward proactive planning and support for towns. Funds for this effort come from the Maine Outdoor Heritage Fund and from the USEPA.

As part of the development of the State Wetlands Conservation Plan, the Wetlands Conservation Task Force Assessment Work Group developed a wetlands management matrix to help identify the appropriate levels (local, regional, state) at which to address wetlands management. The Wetlands Conservation Plan focuses on non-regulatory initiatives to improve wetlands conservation and management.

Restoration and enhancement — Significant efforts have been made since the last 309 assessment to restore coastal wetlands. It is important to note, however, that these efforts have been largely opportunistic, and did not result from an overall assessment and prioritization of restoration needs. Through the Coastal America Program, a new funding source for coastal restoration projects -- the Maine Corporate Wetlands Restoration Partnership -- was launched in July, 2000. Through this program, corporate donations will be used as match for federal funds in coastal restoration projects. The State Planning Office/Maine Coastal Program serves as the state coordinator for this program and will advise the Partnership's executive committee, which will review projects and determine priorities and funding levels for projects.

Coastal America completed several dam removal projects, including dams on the Sebasticook and Machias rivers. They have also begun restoration work in the Weskeag Marsh. Restoration efforts are also under way in Scarborough Marsh by a coalition of grassroots organizations, which have received support from the Natural Resources Conservation Service and the US Fish and Wildlife Service Gulf of Maine Program. Funds from the settlement of the Julie N oil spill in Casco Bay will also help fund the Scarborough Marsh restoration.

Education/outreach — There has been an effort on the part of several organizations to increase the public's knowledge and appreciation of coastal wetlands. Work undertaken in Scarborough Marsh, and funded through 306 CZMA funds, to encourage assessment and monitoring of coastal wetlands by citizens has resulted in increased local stewardship of these wetland resources. Awareness and understanding of coastal wetlands by government agencies has also improved substantially over the last several years, although their actual programs do not always reflect this shift.

Acquisition programs — The State of Maine passed a $50 million bond to fund the acquisition of public land for conservation and recreation through the Land for Maine's Future Program. The program's focus has traditionally been on the acquisition of parcels characterized as state significant.

With the new funding, the LMF Program can now acquire parcels of land of regional and local significance.

Significant Barriers to Coastal Wetland Protection

- ✍ Lack of a thorough spatial and ecological assessment of coastal wetland habitats and conditions.
- ✍ Lack of a method to determine the value of individual restoration projects at a site-specific level and within the entire ecosystem.
- ✍ Lack of a coordinated effort and method to identify and prioritize coastal wetlands, rivers, and salt marsh restoration opportunities.
- ✍ Lack of pre- and post-restoration monitoring research on changes to biological productivity, vegetation, waterbirds, and fish.
- ✍ Significant national economic expansion has resulted in a substantial increase in development pressure and prices for property along Maine's coast. Development pressure in uplands near coastal wetlands has increased, and the cost of acquiring land for restoration or preservation has increased as well.
- ✍ The State lacks a method of tracking cumulative impacts to coastal wetland functions and values, given that many actions which affect these functions occur in uplands.
- ✍ Lack of information of the protective effectiveness in wetlands settings of the state's 250-foot shoreland zoning buffer.
- ✍ Lack of funding for preliminary assessments of potential restoration opportunities including hydrologic and engineering studies and projected cost estimates.

Strategies

✍ *Wetland Protection Strategies*

1. Develop a Management Strategy for Coastal Wetlands Restoration/Protection

a. Proposed program change --

Development of a coordinated management plan and strategy for coastal wetlands restoration. The plan will include an inventory/assessment, identification and prioritization of restoration, enhancement, and acquisition opportunities, development of watershed restoration plans, and development of coordinated funding strategies. The Plan may lead to the development of a CZMA Section 306A Program for wetland restoration.

b. Describe why the proposed change is the most appropriate means --

There is currently a lack of information regarding the historic and current location and condition of coastal wetland systems, and there is no consensus on how to identify and prioritize conservation

strategies for this resource. There has been an increasing level of interest in coastal wetlands restoration, with many organizations and individuals involved, but there is no focused direction to this loosely organized group of stakeholders. This strategy is the most effective means to address this issue because it will bring the efforts and resources of many groups together into a more targeted efficient process to identify, prioritize, and develop management and conservation plans for coastal wetlands systems.

c. General work plan --

Task	Date
Inventory and assess location, extent, historic and current condition of coastal wetlands	July 2001 - June 2003
Establish classification protocols and format	September 2001
Determine loss and/or impacts of coastal wetlands through change detection analysis	February 2002
Conduct field-based inventory of selected sites	Summer 2002
Incorporate field-based results in a widely accessible GIS based instrument including data files and coverages	December 2002
Use inventory results to develop conservation priorities and strategies for coastal wetlands systems	June 2003
Develop coordinated funding schemes	June 2003
Establish priority research objectives through a stakeholder process	June 2002

d. Summary of costs --

	FY2001	FY2002	FY2003	FY2004	FY2005
Staff	$89,579	$93,162	?	?	?
Contracts	20,000	15,000			

COASTAL HAZARDS

Assessment of Coastal Hazard Risks

Background

Coastal hazards include natural events and processes such as storms, shoreline erosion, landslides and sea-level rise that cause the loss of property, threaten public safety and destroy natural resources on the coast. In Maine, the risks from coastal hazards are mostly the loss of public and private property near the shore caused by a combination of shoreline erosion, storms and sea-level rise. Environmental contamination can occur as well from fuel tanks, septic systems and other debris damaged by flooding and storm events. We are also losing some natural resources as sea level rises to cover marshes that cannot extend landward because they are constricted by development. These risks are greatest when development is located near beaches, marshes, and soft bluffs.

Storm and Flood Risk

Coastal hazards in Maine will likely continue at a rate comparable to the rate they have occurred in past years, although some projections suggest that greater frequency and intensity of storm events may accompany anticipated global temperature rise. On average, the Maine coast experiences five to six major coastal storms and dozens of coastal gales per year, continuous erosion of southern Maine beaches, and occasional landslides. Tropical storms and hurricanes occur less frequently. On average, the Maine coast experiences a tropical storm (with sustained winds of 39-73 MPH) once within a five year period, and a hurricane (with winds of 75 MPH or greater) once during a 15-20 year time frame. More importantly, sea level will continue to rise at the rate equal to or greater than the one foot per century documented over the last 100 years. This will further increase the risks from erosion, flooding and wave action.

Recently, the State of Maine received the results of FEMA's application of the SLOSH model to the Gulf of Maine basin. SLOSH predicts storm surge elevations along the coast and in tidal portions of rivers that would be caused by ocean waters driven upstream. Due to bathymetry, topography and building density, coastal York and Cumberland counties are highly vulnerable to the effects of hurricanes. Bangor and Portland are the most vulnerable urban areas. SLOSH maps are another tool that county emergency management directors can use to support efforts for better hurricane planning. The Maine Emergency Management Agency has introduced the maps to county staff and to some local officials. In 2002, the US Army Corps of Engineers is expected to complete an analysis of the carrying capacity of roads and an analysis of the location of emergency shelter locations to assist in storm evacuation planning and preparedness.

There have been two federal disaster declarations caused by coastal storms since 1991. A storm in April 1996 caused over $500,000 in public property damage in coastal towns, and coincided with a

landslide that destroyed two private residences in Rockland. In October 1996, a coastal storm, that is estimated as greater than a 500 year rain event, set a new record for rainfall and caused extensive flooding in southern Maine. The total public and private property damage caused by this event was over $26,000,000.

Level of Risk from Coastal Hazards in Maine

Coastal Hazard	Level of Risk
extratropical storms	high
storm surge	high
flooding	high
chronic erosion	high
hurricanes	medium
episodic erosion	medium
landslides	medium
sea-level rise	medium in near term; high over next century
subsidence	low
earthquakes	low
tsunamis	low

Sea-Level Rise

Studies of shoreline change and coastal erosion project that Maine's coastal sand dune systems, coastal wetlands, and coastal eroding bluffs face the prospect of significant coastal erosion and inundation based on historic rates of change, i.e. without accounting for accelerated rates of sea-level rise (Kelley). The 1995 report, *Anticipatory Planning for Sea-Level Rise along the Coast of Maine* (Maine State Planning Office) included projected changes in shoreline position for different scenarios of accelerated sea-level rise associated with global climate change. As the table below shows, erosion and inundation would be exacerbated in beach and coastal wetlands settings by an accelerated rate of sea-level rise.

Projected Shoreline Change Assuming Accelerated Sea-Level Rise

Environmental Setting	Sea-Level Rise Scenarios Projected Shoreline Change, Retreat in Meters		
Sea-Level Rise	**0.5m**	**1.0m**	**2.0m**
salt marsh	3-35	8-50	17-100
bluff	15-45	15-45	15-45
beach	50-150	100-300	200-600

Source: Anticipatory Planning for Sea-Level Rise Along the Coast of Maine (SPO, 1995)

Using projections from national studies, researchers associated with the sea-level rise project concluded that of the 5,000 acres of salt marsh in the Saco Bay and Casco Bay areas alone, up to 10% of this acreage could be lost where wetland shorelines are already armored and almost 20% of the total could be lost to rising sea level if all coastal wetland shorelines were protected by bulkheads or similar armoring.

Despite the difficulties in evaluating shoreline change due to rising sea-level along Maine's beaches, researchers concluded that a shoreline retreat of hundreds of meters seems likely. Uplands with associated development (roads, utilities, municipal service facilities, businesses and residences), and

heavily-used municipal and state recreational beaches are at risk under these scenarios of accelerated sea-level rise.

Bluff Hazards

Since 1996, the Maine Geological Survey has been conducting field studies that identify and rate coastal hazards along shorelines with sediment bluffs. Bluff erosion contributes to coastal land loss and threatens development.

Efforts to stop bluff erosion, through coastal engineering at the bluff toe, often alter intertidal beaches and mud flats. Furthermore, high clay bluffs along the shores of inner bays and estuaries are also susceptible to coastal landslides. Landslides have destroyed property and threatened lives of Maine residents.

Eroding bluffs have been found along all of the Maine coast, with most concentrated along the developed waterfront of inner coastal bays and estuaries. Casco Bay shorelines and islands with bluffs include towns of Falmouth, Yarmouth, Freeport, Brunswick, and Harpswell. Peninsular mid-coast towns with numerous bluffs include Phippsburg, Georgetown, Westport, Friendship, and Thomaston. The Penobscot Bay and River region also has extensive bluffs in Castine and Bucksport. Bluff erosion affects about 10 times more shoreline length than beach erosion.

Statistics compiled for the mapped region show 53% (1080 miles) of the Maine coast has sediment bluffs. Of this distance, 760 miles (37.5%) of bluff shorelines are in the low-risk *stable* category. *Unstable* bluffs occur along 280 miles (13.7%) and *highly unstable* bluffs are along 40 miles (1.9%). The majority of these 320 miles of unstable bluffs include highly valuable real estate.

Researchers involved in the 1995 study, *Anticipatory Planning for Sea-Level Rise Along the Coast of Maine* found that the rate of erosion in bluff areas is driven more by coastal storms than by a rise in sea-level.

Beach Hazards

Sand beaches comprise only about 1% of Maine's coastline, or less than 35 miles, mostly located along the southern Maine coast, south of Cape Elizabeth. There are very few natural beach and dune systems in southern Maine, and even these show some signs of slow erosion and landward migration driven by sea-level rise. With the exception of a few locations were sand is accumulating because of the influence of jetties, all beaches are experiencing erosion. The severity of beach erosion in southern Maine has been qualitatively estimated by the Maine Geological Survey and separated into three categories (see table below). *Highly erosional* shorelines have high erosion rates (over two feet per year if known), have high reinforced seawalls along the frontal dune, are in need of beach replenishment to replace eroded sand, and have no recreation opportunities for about half the tidal cycle. About 10% of Maine's beaches are highly erosional. *Moderately erosional* beaches have chronic erosional problems, characteristically have seawalls that are impacted by storm waves annually, or, if natural, have chronic dune scarps and frontal dune erosion. Many beaches in this category have gravel berms and most have

limited recreation opportunities at high tide. About 50% of beaches are moderately erosional. *Slightly erosional* beaches have slow erosion rates or variable erosion and accretion rates, often have a sandy summer berm and seasonal exchanges of sand with the offshore, have a fairly large frontal dune, usually have no seawalls and offer recreation opportunities at all tide levels. About 40% of southern Maine beaches fit the *slightly erosional* category.

Status of Southern Maine's Sand Beaches

Beach Name	Development Status [1]	Replenishment History	Erosional Status [2]
Higgins	high	none	moderate
Scarborough	low	none	slight
Western	low	none	moderate
Pine Point	high	dune construction, 1956	slight
East Grand	high	none	slight
Old Orchard Beach	high	none	slight
Ocean Park	medium	none	slight
Kinney Shores	medium	none	slight
Ferry Beach, Saco	medium	none	moderate
Camp Ellis	medium	1919, 1969, 1970, 1978, 1982, 1992, 1996	high
Hills	medium	1989	moderate
Fortune's Rocks	medium	none	moderate
Goochs	high	1985	high
Parsons	low	none	moderate
Crescent Surf	low	none	moderate
Laudholm	low	none	moderate
Drakes Island	high	2000-01	moderate
Wells	high	1990, 1991, 2000-01	moderate
Ogunquit	low	dune restoration 1974-75	moderate
Short Sands	medium	none	moderate
Long Sands	high	none	high

[1] Development status represents an average of both the front and back dunes.
[2] Categories of slight, moderate and high are as defined in the paragraph preceding the table.

Source: Maine Geological Survey

Changes in Management of Coastal Hazards since 1997

Mechanism	Changes since 1997
building restriction	none
repair/rebuilding restrictions	moderate
restrict "hard" shoreline protection structures	none
restrict renovation of shoreline protection structures	none
beach/dune protection	significant
permit compliance program	none
inlet management plans	none
special area management plans	significant
local hazards mitigation planning	moderate
innovative procedures for dealing with "takings"	none
methodologies for determining setbacks	none
disclosure requirements	none
publicly funded infrastructure restrictions	none

In order to provide new quantitative information to decisionmakers, homeowners and volunteers about Maine's changing coastline, Maine Sea Grant, the University of Maine and the Maine Geological Survey launched a volunteer beach profiling project in 1999. Fifteen beaches are currently being profiled year-round on a monthly basis by more than 100 volunteers.

Management of Risks from Coastal Hazards

Maine has taken a number of actions since the last assessment in 1997 to prevent or reduce the risks from coastal hazards and to provide some regulatory flexibility to shorefront property owners. These actions are listed in the table below and described further in the following discussion.

Natural Resources Protection Act (NRPA)

- *Beach/dune protection* — In 1998, NRPA Section 480-B, 1 was amended to change the definition of "coastal sand dune systems" to include to include gravel beaches and gravel deposits. At least 5% of dune systems shown on Maine's sand dune maps are mostly gravel and another 25% are mixed sand and gravel. The change closed a loophole in state law and reflects the original intent of the Natural Resources Protection Act.
- *Repair/rebuilding provisions* — In 1999, the Legislature modified the Natural Resources Protection Act, Section 480-E, 9 to prohibit the Department of Environmental Protection from denying a NRPA permit for reconstruction of a structure, including a structure destroyed by an ocean storm, solely because the structure is located in an area designated a V-zone after January 1, 1999. The law does not change the department's standards for reconstruction activities in a V-zone that was designated as such prior to January 1, 1999. The bill was enacted in response to FEMA's remapping in the Town of Wells that substantially increased the size of the high velocity zone. It offers property owners the ability to apply for a permit to reconstruct storm damaged buildings but does not affect the stringent standards of review for construction of dwellings in sand dune areas.
- *Takings* - Wyer vs. the Board of Environmental Protection and the State of Maine — A decision by the Maine Supreme Court in March of 2000 ruled in favor of the State's frontal dune restriction and determined that no taking had occurred.

Special Area Management Planning

- *Beach Erosion Task Force* (CZMA Section 306 funded) — In late 1997 through 1998, Southern Maine property owners, shoreline business owners, municipal staff, and environmental groups joined SPO, DEP, MIF&W and the Maine Geological Survey in a multi-stakeholder process to identify common ground, avoid future conflicts, and establish increased protection for Maine's sand beaches. Ongoing concerns regarding beach erosion, property at risk, endangered and threatened species habitat, public access and regulation of shoreline development prompted the formation of the stakeholder group. The group's product, *Improving Maine's Beaches* was published in 1998. Recommendations included both continued planning and implementation activities in the following

categories: erosion, environmental monitoring, economic analysis, flood insurance claims data, hazard disclosure requirements, and regional beach management planning. The state's Land and Water Resources Council oversees progress on the reports' recommendations.

- ✍ *Regional Beach Management Plans* (CZMA Section 309 funded) — The *Improving* report (discussed above) recommended that regional groups be formed to create management plans for shared sand beach systems. An MOA between the Maine Coastal Program, the Southern Maine Regional Planning Commission and the towns of Scarborough, Old Orchard Beach, Saco, Wells, and Kennebunk was developed to create a framework for a three year regional beach management planning process. Beach plans were intended to create a common agenda for management of shared sand beach systems. The Saco Bay Plan was completed and adopted by participating towns. The Wells Bay plan is nearing completion (Winter 2001) and the Scarborough plan will be completed by the end of June, 2001. The plans include the following types of recommendations: changes to state regulations, creation of new regional advisory boards, creation of new funding mechanisms, creation of new monitoring programs and public education programs, modification of jetties, and creation of state beach nourishment policies. Surveys of public access needs were conducted as part of the planning process. The state's Land and Water Resources Council oversees the planning process and implementation of the plans after adoption by participating local governments.

Hazards Mitigation Planning (CZMA Section 309 funds)

The Maine Coastal Program and the University of Maine School of Marine Sciences entered into a MOA for a pilot fellowship program for 2000-2002. This arrangement creates a new funding source (University cost-sharing, tuition waiver, project costs) for management-oriented research on coastal priorities. The fellow will conduct an effectiveness study on Maine's coastal hazards policies, including an identification of properties that remain at high risk, and a prioritization of potential buyouts for a future coastal hazard mitigation plan.

Local Hazard Mitigation Planning (FEMA funds)

Saco and Portland were designated Project Impact communities by FEMA. The Project Impact program offers significant funding to communities that design and implement hazard mitigation programs. Both communities have done excellent work in becoming disaster resistant communities and Saco has received national honors for its endeavors. York County has also been awarded status as a Project Impact Community. Saco was Maine's first community to receive a Hazard Mitigation Planning Grant and Wells is the current recipient of funding to develop a hazard mitigation plan.

Mapping and Public Education (CZMA Section 309 funding and FEMA funding)

Funding over the last several years has resulted in new data and maps for the southern half of the Maine coast. Over 2000 miles have been mapped from the shore of the Piscataqua River at the

New Hampshire border to Castine in Penobscot Bay. A full suite of 50 color maps of Coastal Bluffs (depicting bluff stability and shoreline type) is available from MGS through the DOC/MGS publications catalog and online. The maps show two characteristics: *bluff stability* and *shoreline type* along the base of the bluff. In combination, there are 16 map units with varying levels of associated hazard. Using photographs and a colored "stoplight" (red, yellow, green) theme, the maps show the condition of the bluff shoreline in segments of 150 feet or longer. The maps include text and photographs to describe the origin of bluffs, the chronic nature of bluff erosion, and to illustrate the variety in shoreline types in a way that can be understood by the general public.

There is a companion map series to Coastal Bluffs that identifies the landslide hazard. Fifty maps of Coastal Landslide Hazards have been made and distributed to the Maine Emergency Management Agency (MEMA). An extended legend for municipal and public use has been developed and the new landslide map series is being distributed through the MGS catalog and web site. This map series shows six categories of landslide risk and areas where there is no risk. These units can be grouped into four main types of shoreline: (1) where there have been landslides, (2) where there are potential landslide areas (bluffs with features that might be conducive to a landslide), (3) where there are bluffs that are not landslide-prone, and (4) other shorelines that are not at risk of a landslide. Characteristics and recommendations accompany each map unit.

Volunteer Beach Profiling Project and State of Maine's Beaches Conference (funding source - Maine Sea Grant)

The University of Maine and the Maine Geological Survey launched a volunteer beach profiling program in 2000. Volunteers measure changes in beach slope monthly throughout the year, and current meters placed in two embayments measure current direction and wave height. Cross-correlating these measurements with meteorological data allows researchers to observe how beach-profile changes correspond to specific weather events. Besides gathering needed information, the project is building an important new constituency of beach-goers. Planned as a forum to review the volunteer-generated data, the first annual State of Maine's Beaches conference was held in July 2000 and cosponsored by the Maine Coastal Program. Participants in the conference noted that their understanding of natural beach processes and planning efforts had improved as a result of the conference. MCP staff is part of the planning group for creating a sustainable volunteer program after Sea Grant pilot funds are depleted and we will partner to expand the annual Beaches conference as well. See http://www.geology.um.maine.edu/beach/beach for more information.

Floodplain Management (FEMA funds)

✍ *Community Rating System (CRS).* FEMA's community rating system allows residents to reduce rates on flood insurance if the community's flood ordinance meets certain standards. The following Maine coastal towns participate in the CRS: Arrowsic, Cape Elizabeth, Hallowell, Ogunquit, Old Orchard Beach, Phippsburg, Portland, Saco, Southwest Harbor, Wells and York. Saco improved

its classification with the system and Georgetown was a new participant. Brewer is seriously considering CRS.

- *Maine Model Floodplain Management Ordinance*. Changes in the model ordinance included: Changes to definition of terms, such that all development in the floodplain (including minor additions and renovations) must meet minimum standards for flood damage resistant materials, anchoring, construction methods and equipment/services design and location. Standards were added for accessory structures, bridges and containment walls, and a conditional use process was added to allow communities to permit lobster shed and fishing sheds over water. Additional changes to the model ordinance clarified the elevation standard to be used in unnumbered A zones and made the ordinance easier to interpret and administer.
- *Training and Education*. Floodplain management training is routinely offered to local officials through SPO's Code Enforcement Officer training and certification program. The Maine Floodplain Management Handbook (which includes the latest information in sound floodplain management) is updated annually. A two-day workshop for local officials on the new Coastal Construction Manual is in the planning stages for Spring 2001.

Protection/Restoration of Endangered Species

The Maine Audubon Society has expanded their efforts to monitor and restore populations of piping plovers and least terns, both of which are listed on federal and state endangered lists. They have worked with the Town of Wells, Wells property owners and the Wells National Estuarine Research Reserve (WNERR) to create a cooperative agreement for protection of bird habitats. This agreement is viewed as a model to be replicated in the others areas covered by the regional beach planning process. The WNERR produced an excellent set of educational materials on habitats that is widely available in the Wells area, including hotels and motels.

New Partnerships and Resources

- Maine Sea Grant created a new outreach position in Southern Maine, based at the Wells Reserve. This staffer has been involved in the regional beach planning process by assisting with outreach and public access components of the project. Additionally, she has substantial responsibilities for the volunteer beach profiling project, discussed above.
- The Maine Coastal Program, in partnership with the Maine Geological Survey, has been awarded a Coastal Services Center fellowship, beginning in Summer, 2001. The fellow will assist with creation of a beach nourishment policy for the state and will assist with current efforts to implement the Saco Bay Beach Management Plan.

Significant Impediments to Reducing Risks from Coastal Hazards

- ✍ There continues to be considerable debate about Maine's existing retreat policy, which prohibits the reconstruction of buildings in frontal dunes that are damaged by more than 50% of their value. Residents and business owners, supported by municipal officials and local legislators, continue to seek relief through legislative initiatives. The infrequency of property damage from storms in the last decade in Maine has helped to foster a lack of understanding and support for restrictive public policies that formed the basis for regulatory approaches developed in the early 1980's.
- ✍ Despite numerous programs to educate and inform residents about coastal hazards, there is distrust and misunderstanding about coastal processes and the science behind projections of shoreline position and sea-level change. The ability of the regional planning groups to reach consensus and to tackle points of controversy has been hampered by two distinct factions within the groups -- those whose driving interest is protection of private property rights and those whose interests are in environmental protection and risk management.
- ✍ Maine's approach to coastal hazards reduction has not included funding mechanisms to compensate willing sellers for relocation or buyout of properties that remain at risk. The lack of available funding for hazard mitigation and beach nourishment (see below), combined with a strong regulatory approach leaves property owners with little to no reasonable alternative for protection of private properties.
- ✍ Maine's lacks the financial resources to fund expensive remedies to coastal erosion problems, including modification to engineered structures, beach nourishment and dune restoration. Private ownership of much of Maine's sandy beach coastline prohibits public expenditures that would benefit private property owners. Until recently, the state has not placed a priority on partnering with municipalities on effective solutions.
- ✍ Since amendments were made to the Sand Dune Rules in 1993, reconstruction and limited expansions of buildings (that have never been damaged by an ocean storm), are permitted, provided that the reconstruction meets certain standards. Due to a variety of circumstances (lot size and configuration, outdated or inaccurate flood maps), rebuilding of structures in sand dune systems does not always occur in a manner and location that is safe and sustainable given accelerated sea-level rise and anticipated increased flood risk.
- ✍ Legislative attempts to create floodplain and hazard disclosure requirements have not been successful. Education programs aimed at informing consumers are expensive and widespread coverage cannot be assured.
- ✍ Rip rap is still commonly used to "stabilize" eroding bluffs. Maine's experience with vegetated "soft solutions" that offer longer term protection and create wildlife habitat is limited.
- ✍ Lack of meta-data and lack of state agency policies about digital delivery of mapped information results in less than optimum distribution of information about coastal hazards.

Strategies

Coastal Hazards Strategies

✍ *Education/Outreach Strategies*

1. Collaborate with Sea Grant Marine Extension, the Wells Reserve, and the Humboldt Field Research Institute on new public education initiatives for municipal officials, homeowners and visitors on coastal hazards. Design an outreach program that uses a variety of media including, TV, radio and print, in addition to events (annual State of Maine's Beaches conference) and occasional lectures. In addition to information about coastal hazards and emergency preparedness, include information on positive solutions such as dune management, beach profiling, sound construction, compatible landscaping, etc.

2. Provide funding to SPO's Code Enforcement Officer Training and Certification Program and the Floodplain Management Program to hold workshops on FEMA's new Coastal Construction Manual. Continue to support CEO training and certification including modules on shoreland zoning, floodplain management and NRPA overview. Encourage a collaboration with the Maine Emergency Management Agency on their concept of training vocational technical students and technical college students about sound construction techniques.

3. Assist MGS in offering regular training sessions for DEP staff in sand dune permitting review and inspection, including a field component.

✍ *Research Strategies*

1. Help match researchers and funding opportunities for research projects of importance to Maine's beach and bluff environments including dune restoration, economic valuation and demonstration projects for soft solutions for bluff stabilization. Help disseminate results.

✍ *Water Quality and Habitat Restoration Strategies*

1. Develop new Shore Stewards volunteer monitoring programs for swimming beaches and offer small grants to launch shellfish restoration monitoring and restoration programs.

✍ *Beach Management Strategies*

1. Creating Mechanisms for Regional Beach Management. As discussed in the previous section, the Saco Bay and Wells Bay Regional Beach Management Plans created MOA's between participating municipalities and state agencies and created recommendations for improved management of sand beach resources. This strategy will create the necessary program changes for full implementation of the plans' recommendations.

a. Proposed program changes --

Program changes anticipated from this work include 1) amendment of the Natural Resources Protection Act and the model Shoreland Zoning Ordinance (or local shoreland zoning ordinances) to eliminate duplication and confusion about standards in overlapping districts; 2) amendment of the NRPA to improve standards for floodproofing during reconstruction and renovation; 3) development of hazard mitigation plans including willing seller buyout programs and community redevelopment plans; 4) development of new funding sources for hazard mitigation activities; 5) development of a state policy and guidelines for beach nourishment; 6) development of new funding sources for beach nourishment; and 7) development of easements or other mechanisms for public use of beaches nourished with public funds.

b. Why the proposed change is the most appropriate means --

Without additional program changes as described above, Maine's sand dune regulations will continue to be challenged through legislative initiatives and court challenges. The suite of program changes described above represents a shift from a reactionary defense of the existing regulatory framework to a more proactive approach that includes new approaches to erosion control.

c. General work program --

Task	Date
Create implementation teams in Saco and Wells via MOA's	Winter 2001
Create implementation team in Scarborough	July 2001
Clarify sand ownership, property ownership and public trust rights	2001
Address NRPA/SZ overlapping jurisdiction	2001, 2002
Enter into rulemaking process for changes to sand dune rules	2001, 2002
Develop new funding programs for beach restoration	2002, 2003
Create coastal hazard mitigation plan, including willing seller buyout plan	2002
Create beach nourishment policy	2001, 2002
Establish public easement requirement for beaches nourished w/public $	2001, 2002
Monitor results of nourishment projects	2004, 2005

d. Estimated costs --

	FY2001	FY2002	FY2003	FY2004	FY2005
Staff SMRPC	$40,000	$40,000	$40,000		
Staff DEP	55,000	55,000	55,000		
Contracts		30,000	30,000	30,000	30,000
CSC fellow	MGS	MGS			
UM Fellow	15,500				

e. Likelihood of success --

The regional beach management planning process has created momentum for improved management of sand dune systems. There is a high likelihood of success for program changes involving state/local regulations. Less certain is our ability to create new funding sources for creative

approaches. A strong constituency has developed among southern Maine residents to help build support for these strategies.

2. Create New Setbacks for Development Adjacent to Eroding Bluffs.

a. Proposed program change --

The multi-year mapping project conducted by the Maine Geological Survey has identified locations of hazardous bluff conditions throughout the coast. Efforts to date have focused on educating municipal officials and the public about bluff hazards. A new setback requirement would be added to the Natural Resources Protection Act and/or the Model Shoreland Zoning Act to ensure that proper setbacks are maintained.

b. Why the proposed program change is the most appropriate means --

Educational approaches are not effective in ensuring sound sitings of new development in bluff areas. The NRPA and Shoreland Zoning are effective ways to address this issue. New setback requirements would expand regulatory jurisdiction over projects adjacent to bluffs. All new construction projects adjacent to bluff areas would be subject to new requirements.

c. General work plan --

Task	Date
Convene small interagency work group	July 2002
Create setback standards	October 2002
Submit NRPA amendment to Legislature	January 2003
Adopt new standards	April 2003
Outreach on new standards to municipalities and development communities	ongoing

d. Estimated costs --

	FY2001	FY2002	FY2003	FY2004	FY2005
DEP Staff		$15,000			
Contracts			$10,000		

e. Likelihood of success --

Mapping efforts have provided thorough documentation of bluff hazard risks along half of the Maine coast. There is a high likelihood of success for this effort which will protect private property and reduce emergency management costs to municipalities.

3. Create Hazard Disclosure Requirement.

a. Proposed program change --

A hazard disclosure requirement would help potential buyers make informed decisions about risks, including erosion, flooding and landslides.

b. Why the proposed change is the most appropriate means --

Public education programs are expensive and it is impossible to ensure that materials reach the right audience on a consistent basis. A required disclosure statement is the only method available to ensure that potential buyers are aware of risks associated with coastal development.

c. General work plan --

Task	Date
Create work group	July 2004
Design disclosure requirements	October 2004
Submit legislation	January 2005
Outreach	ongoing

d. Anticipated costs --

	FY2001	FY2002	FY2003	FY2004	FY2005
SPO staff				$15,000	
Contracts					$15,000

e. Likelihood of Success --

Success of this approach depends largely on the political environment at the time the proposal is introduced. A hazard disclosure effort in 1999 was unsuccessful. A constituency of individuals needs to be developed to support this approach. Outreach efforts already underway should assist in creating this supportive constituency.

OTHER HIGH PRIORITY ISSUES

IMPACTS OF DEVELOPMENT

Maine lacks the financial and technical ability to accurately characterize the primary and secondary impacts of development on a coastwide basis. This section attempts to generally describe the impacts of development along the Maine coast by briefly describing population growth trends and by describing known coastal impacts such as degraded water quality and habitat. Summaries of permit trends and permit compliance rates are also offered. This section does identify geographic locations that are known to be affected by point and non-point sources of pollution and mentions other geographic areas of concern. Other sections of this plan explore the impacts of development on coastal resources in a more specific fashion -- see separate sections on coastal hazards, coastal wetlands and public access for more detailed information.

Resource Characterization

Growth in the Coastal Area

Although Maine's coastal zone (defined as the municipalities and unincorporated areas that border tidal waters) comprises only 15% of the land area in Maine, the coast is home to about 44% of Maine's population. Close to 534,000 people live and work year-round along the Maine coast and the summer season brings an additional 100,000 residents. Maine's island communities have also experienced increased summer populations and numbers of day-trippers in recent years as evidenced by seasonal home construction, ferry ridership and recreational use of islands by kayakers and boaters. Coastal municipalities have an average density five times greater than the balance of the state (124 persons per square mile compared with 21 persons per square mile inland). Population in the coastal region grew almost twice as fast as in inland regions over the 1980's and 1990's.

As a whole, Maine's population is growing slowly (2.05 % from 1990 to 1999), especially when compared to other coastal regions of the country. Some coastal towns, however, have experienced population growth rates of 13% to 18% during the 1990's. Large percentage increases, although they represent meager increases in terms of actual new residents, have large impacts on Maine's small towns.

Patterns of Development

The Maine Environmental Priorities Project in 1996 identified Maine's "patterns of land development" as an issue with wide-ranging ramifications for a range of high priority environmental quality concerns, ranging from groundwater degradation to loss of agricultural resources to the health of freshwater and

marine ecosystems. Maine's population is by and large spreading out, with formerly vibrant service center communities losing population while surrounding growth in adjacent suburbs and rural areas is increasing. Development sprawl has major fiscal ramifications for the state and for municipalities, but also carries environmental costs such as increased levels of non point source pollution and fragmentation of important wildlife habitats. Increased development in more rural areas negatively affects traditional natural resource-related activities such as farming, forestry, and fishing that are the critical to the economic and cultural fabric of coastal Maine. High demand for residential housing and commercial tourist related businesses has especially impacted Maine's working waterfront communities where user-conflicts and rising taxes are causing displacement of marine-related businesses, and causing concerns about affordable housing.

Trends in State Permitting of Development

With a strong economy in the latter part of the 1990's, commercial and residential development pressures along the coast of Maine have increased. Poorly sited and designed development can alter water quality, displace and/or shade habitats, increase erosion and stormwater runoff and change circulation patterns. State environmental laws have been developed to reduce impacts to coastal and marine habitats while allowing for growth and development. The following is a summary of issues and trends related to state permitting of development in the coastal zone.

Natural Resources Protection Act — Permitting activity continues to be focused in the southern portions of the State with a gradual increase in recent years into the midcoast region under both the Site Location of Development Law and the Natural Resources Protection Act. Under the NRPA, recent development pressure is primarily focused on coastal wetlands and sand dunes, reflecting the increased pressure to provide building sites, dredge for boat access and rehabilitate and build new docks and piers for water access. Smaller projects for routine activities that should not cause significant harm to the environment (provided that the standards are followed) are covered by the streamlined Permit-by Rule (PBR) process. The permit by rule program continues to be an increasing component of DEP's licensing program, increasing by almost 25% over the five year period from 1994 to 1998. The PBR program was analyzed at the request of the Legislature in 1997 and overall compliance with the standards was determined to be 82%.

In 1998/1999, an assessment of development activity potentially affecting Maine's intertidal and subtidal habitats under the NRPA was conducted. An analysis of permit activity between the years 1994 and 1998 showed the following results:

- Full NRPA permits for piers and shoreline stabilization increased, while dredging and fill permits remained about the same.
- Permit by rule activities increased significantly for projects such as soil disturbance, riprap, piers, wharves and pilings.
- Five hundred and ten new piers, wharves, and pilings were approved coastwide, most under the Permit-by-Rule process, with an approximate 20% increase in pier activity in Southern Maine. The midcoast region from Wiscasset to Vinalhaven had the highest permit by rule activity of all the coastal regions for piers, wharves and pilings.

- ✍ From 1994 - 1998, 23 acres of intertidal habitat have been impounded or filled for lobster pounds in Washington County.
- ✍ In the Eastern Maine region from Isle au Haut to Calais, over 40% more applications were received and approved in 1998 than in 1994.

Shoreland Zoning — Maine's *Mandatory Shoreland Zoning Act* requires all of Maine's organized municipalities to adopt locally administered ordinances that regulate land use activities in the shoreland zone. The shoreland zone consists of land areas within 250 feet, horizontal distance, of great ponds, rivers, tidal waters, and freshwater and coastal wetlands, as well as areas within 75 feet of certain streams. If a municipality does not enact a suitable ordinance the Board of Environmental Protection is required to adopt a suitable ordinance for the municipality through a rulemaking process. Of Maine's 144 coastal municipalities, only seven have fully "state-imposed" ordinances, and three have parts of the state-imposed ordinance as a supplement to their locally adopted ordinance.

In recent years, Department of Environmental Protection staff reviewed numerous newly developed subdivisions at both inland and coastal locations for compliance with setback and vegetative buffer standards. Setback requirements were generally met and, as required by law, new cleared openings to the water were not being created. Vegetative buffer widths were sometimes less than required and the percentage of vegetation growth removed was sometimes more than allowed. Compliance in coastal areas was greater than on inland lakes.

In 1999 the Department conducted audits of several coastal communities to determine the effectiveness of shoreland zoning in those towns. A significant variation in the levels of effort was found although most towns were doing a reasonably good job in the administration of the ordinances. Problems identified included variability in measuring setback distances, failure to seek DEP approval for amendments to municipal shoreland zoning ordinances, and lack of methods to track limits on expansion of nonconforming uses.

Technical Assistance Needs of Coastal Communities — Technical assistance to local governments within the coastal zone is coordinated by the State Planning Office. Staff works with the Maine Municipal Association, regional planning councils, the DEP, professional organizations and other partners to coordinate direct technical assistance to towns. Technical assistance includes training, access to information on the Internet, printed technical assistance documents, and direct contact with local officials regarding local planning issues and coastal concerns. Annual training is offered on subdivision and site plan review, legal issues and other topics that help Planning Boards review development proposals.

In March 2000, SPO surveyed municipal staff and local officials about technical assistance needs. Specific questions were aimed at coastal planning needs. Top responses for technical assistance needs were for coastal materials related to: public access, harbor and waterfront improvements, municipal input into aquaculture leasing, and assistance with various ordinances. Top responses for the desired types of coastal grants to municipalities were related again to coastal access and harbor planning grants, coastal access acquisition and harbor infrastructure grants.

Water Quality Impacts *(Source ME DEP's Draft 2000 305(b) Report)*

Coastal Nonpoint Source Pollution — The State of Maine designated nonpoint source priority watersheds in 1998 and will update the list as needed. Listed waterbodies have both significant value from a regional or statewide resource and habitat perspective, and water quality that is either impaired, or threatened to some degree due to nonpoint source water pollution from land use activities in the watershed. The following table identifies coastal priority watersheds as determined by Maine Watershed Management Committee. Volunteer monitoring groups monitor and assess the condition of many of these estuaries.

The Medomak River, the Royal River estuary, the Mousam River estuary, the Piscataqua River estuary, the St. George River estuary, Goosefare Brook and the Ogunquit River estuary are on DEP's 2000 Nonattainment List because portions of these estuaries do not meet state standards for dissolved oxygen. The reasons for nonattainment are varied and include natural factors such as benthic respiration and physical circulation factors. Generally, data from various studies and volunteer monitoring groups show oxygen levels along the Maine coast are adequate for the protection of aquatic life. Although some estuaries contain oxygen levels that do not meet the dissolved oxygen standards of their assigned classification, it was concluded that many of the levels measured were a result of natural processes. DEP will review the appropriateness of statutory dissolved oxygen standards for estuarine and marine waters. Additionally, the Wells Reserve is conducting a study, funded by the Maine Coastal Program, that will attempt to explain low dissolved oxygen levels in marsh-dominated estuaries.

Priority Coastal Waters with Threatened or Impaired Water Quality from Nonpoint Source Pollution*

	Water Quality Problem or Threat		
Coastal Waters	**Bacteria**	**Dissolved Oxygen**	**Toxic Contamination**
Piscataqua River estuary*			x
Spruce Creek	x	x	x
York River estuary		x	
Ogunquit River estuary*	x	x	
Webhannet River estuary	x	x	
Scarborough River estuary	x		x
Royal River estuary*	x		
Cousins River estuary	x		
Harraseeket River estuary	x		
Maquoit Bay	x		
New Meadows River estuary	x	x	x
Medomak River estuary*	x	x	
St. George River estuary*	x	x	
Weskeag River	x	x	
Rockland Harbor	x		x
Union River estuary	x		
Machias River estuary	x		

*These estuaries are also on the DEP 2000 303 (d) Nonattainment List (i.e. waters that currently do not meet the standards for their classification.)

Eutrophication — Although there are estuaries that do not meet state water quality dissolved oxygen standards as described above, incidences of hypoxia (>0-≤2 mg/l

dissolved oxygen) or anoxia appear to be episodic in Maine. Some events have been caused by influxes of large schools of fish and some are explained by algae blooms being blown into small embayments. Some occurrences have not been explained. While toxic algae blooms occur periodically in the spring and summer, the blooms are showing no trends and are not considered to be related to nutrient enrichment from human sources. No nuisance blooms (e.g. Phaeocystis) have been reported recently. Trends in marcoalgal abundance of green algae (e.g. Enteromorpha) are unknown but the abundance appears to be increasing in some areas. In a statistical analysis conducted for the 1996 dissolved oxygen study for 16 estuaries along the coast of Maine (Dissolved Oxygen in Maine Estuaries and Embayments: 1996 Results and Analyses by John Kelly; Aug. 30, 1997; DEPW97-23), the results suggested land-derived nitrogen loading. In many areas, particularly those from eastern Maine to offshore Penobscot Bay, a major nutrient source appears to be from offshore waters. Overall, the high tidal range, the relatively low river flows (except the Penobscot and the Kennebec), the relatively low population densities in most areas and limited agricultural nutrient runoff results in limited anthropogenic impacts at this time. Small, poorly flushed bays that have watersheds with growing populations are where signs of eutrophication such as nuisance macroalgae, occasional phytoplankton blooms in the summer and lowered dissolved oxygen levels have started to emerge. At this time the impaired use is principally from the toxic algae blooms. The Department of Marine Resources with the help of volunteers closes shellfish harvesting areas to protect the public health when toxic algae blooms ("red tide") occur.

Bacterial Pollution - Shellfish Harvest Area Closures — Shellfish harvesting areas are closed by the Department of Marine Resources when elevated levels of bacteria are present. Water samples are collected for fecal coliform bacteria testing at more than 2000 established sites along the Maine coast. DMR also classifies a growing area as closed if the visual inspection of the shoreline (shoreline survey) indicates the potential for sewage pollution problems. Shellfish areas are classified as "approved for harvesting", "conditional or restricted under a designated set of environmental conditions" or "prohibited". As of December 31, 1999, 89% of Maine's 1,825,000 acres (as measured from high tide to the 3-mile limit) were classified as approved, 2% were conditionally approved and 9% were prohibited. Increased water testing, aggressive removal of pollution sources, participation of volunteers and excellent collaboration between the Department of Environmental Protection and the Department of Marine Resources have resulted in upward reclassifications. From 1998 to 1999, 43,950 acres were reclassified as approved. Of the shellfish areas reported as closed in the Maine's 1998 305b report to EPA, 41 have been opened and five closed. As of December 31, 1999, the total number of closed shellfish areas was 201, down from the 237 closed as of April 1998.

Swimming Beach Closures — There is growing public interest in monitoring ocean beaches for protection of swimmer health although in the past it has not been a priority due to predominantly good water quality and low bather density. Towns that have combined sewer overflows that may impact swimming areas are required to monitor the swimming area and report the data and number of closures to DEP annually. Of the sixteen swimming beaches monitored along the coast, there were only six warnings posted in 1999, two in South Portland at Willard Beach and four in Portland at East End Beach.

Toxic Contamination — Several programs have monitored toxic contaminants along Maine's coast including: the Surface Water Ambient Toxics Monitoring Program, Gulfwatch of the Gulf of Maine Council, Casco Bay Estuary Project and the Dioxin Monitoring Program. Toxic contaminants have been monitored in surficial sediments, blue mussel tissue, lobster tissues and tomalley and cormorant feathers and blood.

A human health consumption advisory has existed since 1992 coastwide against the consumption of lobster tomalley due to elevated levels of PCBs and dioxins. No evidence of elevated levels of toxic contaminants was found in lobster meat. Mercury and PCBs have been detected in striped bass and bluefish caught in coastal and intertidal waters of Maine. Because these two fish are becoming popular recreational fisheries, advisories for sport caught striped bass and bluefish have been in existence since 1996.

Elevated levels of toxic contaminants tend to be present in harbors, commercial ports, the mouths of river watersheds and areas adjacent to population centers. Areas that have a "dirty history" (i.e., manufacturing or some other past activity) may still be a source of toxics. The geographic extent of toxic contamination tends to be localized. Most areas that are away from human activity, past and present, contain natural background concentrations. Based on sediment and tissue analyses, areas of concern include six areas of Maine's coast as listed in the table.

Marine and Estuarine Areas of Concern for Toxic Contamination[1]

Location	Area
Piscataqua River estuary	2,560 acres
Fore River	1,230 acres
Back Cove	460 acres
Presumpscot River estuary	620 acres
Boothbay Harbor	410 acres
Cape Rosier	80 acres

[1] Based on professional judgment of MDEP staff. Empirical evidence to conclude non-attainment or adverse impact is lacking. Biological standards must be developed to assess attainment and monitoring must be conducted to assess impact.

Coastal Wildlife — Maine's coast supports a wide diversity of wildlife, some of which are considered endangered, threatened or of special concern. One indication of the cumulative impacts of development on wildlife habitat is the fact that many of the more than 1,900 known occurrences of endangered, threatened and species of special concern in Maine occur on or near the coast. The roseate tern, least tern, and piping plover are endangered species; the bald eagle, harlequin duck, Atlantic puffin, razorbill auk, and Arctic tern are threatened species. The status of many species has improved with protection and habitat conservation, although certain species are under more intensive management because of their rarity. Management responsibility for wildlife rests primarily with Maine's Department of Inland Fisheries and Wildlife (MDIFW) or federal agencies.

Endangered, Threatened, and Special Concern Species — Essential Habitat designation under the Maine Endangered Species Act continues to be a valuable tool in protecting sites for Endangered and Threatened Species. Currently, 320 bald eagle nest sites, nine piping plover and least tern nesting, feeding, and brood-rearing areas, and 21 roseate tern nesting areas have been identified as Essential

Habitat. The success of this program continues to be demonstrated not only in the species' response to Essential Habitat protection, but also in the cooperative partnerships that have developed among state agencies, municipalities, and private landowners, thus avoiding land-use conflicts where Endangered Species are of concern.

Birds and Mammals — Many other species of birds (shorebirds, waterfowl, wading birds, seabirds) and mammals occupy coastal areas of Maine for all or a portion of the year and efforts are being taken to conserve their habitats.

Populations of migratory waterfowl and wading birds in tidal habitats are surveyed annually by MDIFW biologists for various purposes. Nesting colonies are visited to determine presence or absence of birds, estimate numbers of breeding pairs, and evaluate the condition of habitats. Populations for most species are either increasing or within the range of recently observed estimates.

The Maine coast is recognized as a critical staging area for migratory shorebirds, a stopover on their long migration route. The shorebirds rely on mudflats rich in invertebrates for feeding and gravel bars or sand spits for roosting, both of which are susceptible to disturbance and environmental contaminants. Twenty-eight species of migratory shorebirds have been surveyed along the coast, several of which are of special concern in Maine. MDIFW has identified and mapped almost 500 shorebird sites on the coast. More than 200 of these sites considered areas of management concern as defined by criteria in the Shorebird Management System.

Seabird populations are increasing in response to management or as species naturally recover from over utilization in the late 1800s and early 1900s. Twenty-one species of nesting seabirds and wading birds nest on 300 to 400 (roughly 10 percent) of Maine's islands. In 1998, 234 seabird nesting islands were designated Significant Habitat and are protected under the Maine Natural Resource Protection Act.

Marine mammals included on the federal endangered or threatened species list are protected within Maine. Although responsibility for marine mammals falls to the Department of Marine Resources and National Marine Fisheries Service (NMFS), MDIFW staff track seal haulouts based on data collected by the University of Maine. Recent surveys indicate the harbor seal population is doing well and has been increasing. Gray seals have also been increasing along the Maine coast and recently established a pupping colony. Harp seals and hooded seals have been seen more frequently.

Coastal Plant Habitats and Natural Communities — Twenty-two plant species listed or proposed by the Maine Natural Areas Program as Endangered or Threatened are strictly coastal plants. Examples include Inkberry (*Ilex glabra*), whose only location in Maine is in one coastal bog, and the Nova Scotia False Foxglove (*Agalinis neoscotica*), a small wildflower known from a few peninsulas in Washington and Hancock counties. Many of these plants are common elsewhere but reach their range limit and are rare in Maine: an example is beach plum (*Prunus maritima*), so characteristic of beaches farther south. Some characteristically coastal plants are considered unusual but not Threatened or Endangered. These include plants like the Beach-head Iris (*Iris setosa*), Oysterleaf (*Mertensia maritime*) and Roseroot

Stonecrop (*Rhodalia rosea*) typical of exposed locations downeast. Attention to these unusual plants can prevent them from becoming rarer.

Another eleven species of strictly coastal plants, including the Coast Violet (*Viola brittoniana*) and Schreber's Aster (*Aster schreberi*), are considered Historic in the state as they have not been seen in at least twenty-five years. Important habitats for rare coastal plants include beach dune systems, rock outcrops with scattered pitch pines, the intertidal zone of estuaries, coastal bogs, and barren rocky areas near or above the high tide line.

Management Activities to Address the Impacts of Development

State Regulation

Watershed Management Framework (CZMA Section 309 funds) — The Legislature authorized the creation of a "Comprehensive Watershed Management Protection Program" (5 MRSA§3331(7)), directing the Land and Water Resources Council to coordinate the activities of state agencies involved in watershed management. An interagency Maine Watershed Management Committee (MWMC) was created and provides a forum for joint activities, communication, funding and policy direction for the watershed program. Based on criteria established in the law, the MWMC (in 1998) developed a list of priority watersheds for targeted funding and technical assistance. The Land and Water Resource Council approved the list after an extensive public comment period. The watershed management framework is also now an integral approach to reduction of nonpoint source pollution documented in the state's 6217 coastal NPS program. Implementation activities for the coastal priority watershed program and the priority salmon rivers are discussed in the section below on "technical and financial assistance".

Implementation of the Stormwater and Erosion Control Laws (CZMA Section 309 funds) — Administrative procedures and guidance were developed to implement two new laws designed to address the most significant sources of non point source pollution in coastal waters -- the erosion and sedimentation control law (38 MRSA §420-C) and the stormwater management law (38 MRSA §420-D.) Rules, application forms, permit procedures, site permit and enforcement protocols and outreach materials were developed. Department of Environmental Protection staff were trained to perform permit reviews and site inspections.

Monitoring of Best Management Practices (CZMA Section 309 funds), Analysis of Best Management Practices (BMPs) — A research project analyzing two BMP treatments provided important information about the use and effectiveness of the treatments in Maine's cold climate and soil conditions. The state's stormwater BMP guidance is now based on more informed experience with previously untested techniques.

Model Shoreland Zoning Ordinance — The law now allows towns to enact an alternative method of limiting expansions of nonconforming structures. It also contains incentives for addressing nonpoint source pollution and for moving structures away from the water. Another significant legislative amendment clarifies that recreational boat storage buildings are not considered water-dependent uses. Previously these structures were being built directly on the shoreline and were designed for recreational activities as the primary use. As a result of a Supreme Court decision, the DEP currently has a bill before the legislature to require municipalities to submit copies of variance requests at least 20 days before the variance request is acted upon. This will improve DEP's ability to intervene and assist towns with correctly administering shoreland zoning variance requests.

To provide for more accurate shoreland zoning for wetlands, the Department of Environmental Protection (with the help of an EPA wetlands grant), produced approximately 225 municipal shoreland zoning maps. Zoning districts in other shoreland areas within the towns were also updated and nearly 75% of the maps were incorporated into town ordinances.

Site Law — There were major substantive changes to the Site Location of Development Law in 1997. The most significant of these changes is the transfer of responsibility for review of medium-sized developments from DEP to municipalities who are deemed to have the capacity to do so. All municipalities of over 5,000 population will be deemed to have capacity by 2003. SPO and DEP worked with a municipal advisory committee to identify technical assistance needs associated with these new tasks. An initial set of technical assistance bulletins was produced and distributed and a second set is in production. Published materials have been supplemented with workshops.

Natural Resources Protection Act (NRPA), Permit by Rule Chapter 305 — The Permit by Rule Standards were strengthened by incorporating a requirement that all activities eligible for PBR must comply with municipal shoreland zoning ordinances. Additionally, a provision for discretionary authority was added to the rule allowing the DEP to require an individual NRPA permit for projects otherwise meeting the PBR provisions where significant cumulative impact may occur or a special concern for a natural resource exists. In a number of areas, standards were reworded or expanded to strengthen them. For a number of activities (e.g. stream and utility crossings), a construction window of July 15 to October 1 was added. Crossings conducted outside of that window must first notify and receive approval for the timing of the activity from other state natural resource agencies (Department of Inland Fisheries and Wildlife, the Department of Marine Resources and the Atlantic Salmon Commission) before filing their PBR notification with the department.

Improvement of NRPA Permit Reviews — Through the efforts of a Coastal Services Center Fellow, materials were developed to assist in permit reviews of projects in coastal wetland areas. *Maine's Coastal Wetlands: Vol. I - Types, Distribution, Rankings, Functions and Values, and Vol. II - Recommended Functional Assessment Guidelines*, Alison Ward, 1999, is a two volume report that addresses the need for reference material on coastal wetlands of Maine and the need for a standard wetland assessment method for intertidal wetlands used in the permitting process statewide. Volume I, designed for reference by DEP project managers, review agencies and consultants, provides biological and geological information on Maine's coastal habitats (wetlands) and summarizes current development

over the past five years within coastal wetlands in Maine. Volume II, written for professional consultants, provides recommended functional assessment guidelines that can satisfy the functional wetland assessment requirement in intertidal habitats for Natural Resources Protection Act (NRPA) applications.

Permit Tracking — Effective in October 1999, the Division of Land Resource Regulation at DEP now has the capability to track condition compliance data on an Application Tracking System. Previously all such data (as well as on-site inspection reports) were manually collected. It is anticipated that the new computer capability will greatly increase the ability to monitor permitted facilities and to address deficiencies and other noncompliance issues.

Code Enforcement Officer Certification — The SPO Code Enforcement Training and Certification Program maintains an aggressive training and support program for local code enforcement officials, coupled with mandatory testing and certification requirements. Approximately 94 percent of all coastal communities now have a certified CEO, compared to 91 percent in 1996. Currently, of those CEOs who are municipally employed, 29% are advanced certified, a 3% increase from 1996. There has been a 9% increase from 1996 in the number of CEO's trained to represent their municipalities in court under the Rule 80K program, allowing for more efficient processing of violations.

Technical and Financial Assistance

Coastal Watershed Planning (CZMA Section 309 funded) — Building on the designation of priority coastal watersheds as described under "state regulations" in the previous section, the Coastal Program has worked on a variety of watershed planning and implementation activities in support of this new framework. Also considered to be priority waterbodies are the seven designated salmon rivers in Midcoast and Downeast Maine. Activities have included:

- development of interagency technical assistance teams;
- formation, strategic planning and ongoing support for regional watershed councils;
- grants to support local/regional activities that will lead to creation of watershed management plans and interlocal agreements;
- watershed surveys and monitoring to identify pollution sources
- assistance with grant writing so that coastal watershed projects are better represented among CWA Section 319-funded projects;
- amendments to eligibility criteria for Maine Department of Transportation's surface water improvement program to allow coastal projects to compete for funds.

Smart Growth — Over the last four years, the Coastal Program (through CZMA Section 306 funds) has supported many aspects of Maine's Smart Growth initiative. Growing smart involves identifying and eliminating the State's hidden subsidies of sprawl, targeting State growth-related capital investments to growth areas designated in local comprehensive plans, supporting the economic viability of traditional natural resource-based industries, developing new intermunicipal and regional models of land use management, and integrating policies and programs of the various State agencies. Products have included:

- research to characterize the issue (*Cost of Sprawl, Markets for Traditional Neighborhoods)*;
- public discourse through statewide forums, workshops and presentations;
- pilot grant programs (mentioned in the next section);
- training and tool development including the Smart Growth Institute and Smart Growth Toolbox;
- staff support for the Legislature's Smart Growth Task Force;
- technical assistance materials for towns (*Guide to Livable Design* and *Municipal Smart Growth Handbook)*;
- development of an Educational Campaign about smart growth alternatives for homebuyers;
- collaborative projects with towns to help site "Great American Neighborhoods" that offer an alternative to sprawl; and
- technical assistance related to siting of new schools.

Pilot Smart Growth Grant Programs — SPO's Smart Growth Program places an emphasis on directing new growth and development into identified service areas and away from rural areas and areas containing sensitive natural resources. The program also places an emphasis on supporting fishing, farming and forestry businesses in rural areas. Seven coastal towns received Regional Centers Infrastructure Grants (1997 and 1998) to assist with programs that make coastal centers desirable places to live. In 1999, the Rural Initiatives Grant program supported four projects to support the viability of traditional coastal activities -- clam harvesting, farming, lobstering and aquaculture. In January 2001, SPO offered four coastal towns grants to undertake a community visioning process as part of their comprehensive plan updates. Three coastal towns were offered smart growth challenge grants in January 2001 to develop smart growth strategies.

Municipal Comprehensive Planning — As of January 2001, 115 out of Maine's 144 coastal towns have received a grant from the State to prepare a comprehensive plan. Sixty-seven of these communities have completed comprehensive plans that were approved by the state as consistent with the goals of the Growth Management Act. Sixty-one coastal communities were offered implementation grants to develop ordinances. Four coastal communities have adopted ordinances that have been determined to be consistent by the state with comprehensive planning goals. These numbers represent modest improvements in coastal community planning despite weakening of the Growth Management Act, limits in state funding, and the lack of any coastal zone management grants for planning over the last few years. Four coastal towns were awarded implementation grants in January 2001.

Coastal Change Analysis Project — Maine was the fifth state to work collaboratively with NOAA's Coastal Services Center's Coastal Change Analysis Program. Upon completion of the project in Winter 2001, Maine's regional councils and coastal towns will be provided with land use/land cover data and change analysis comparing scenes from the mid-80s and the mid-90s. The data is useful for large scale comprehensive planning. The project CD contains case studies that illustrate the use of GIS and remote sensing data for coastal management including restoring salmon habitat, improving oil spill response, ecological characterization, and habitat planning.

Southern Maine Initiative — The State Planning Office is facilitating a new collaboration among the Maine Department of Inland Fisheries and Wildlife, the Natural Areas Program, the Wells Reserve, USFWS and the Southern Maine Regional Planning Commission to provide new information and technical assistance to Southern Maine towns for regional open space and habitat planning and protection.

Nonpoint Education for Municipal Officials (NEMO) — CZMA Section 306 funds helped support the startup of the NEMO program in Maine, with the coastal town of Freeport as the pilot site. NEMO provides local officials with a visual tutorial about how land use ordinances contribute to nonpoint source pollution. After several work sessions with Freeport, the NEMO team is providing technical assistance for revisions of the town's subdivision regulations, focusing on improving stormwater management provisions. The NEMO steering committee is forming partnerships to bring NEMO to other parts of the state.

Publications and On-line Materials — SPO has published a *Model Site Plan Ordinance*, a *Wireless Telecommunication Siting Ordinance*, the *Cost of Sprawl* report, the *Eco-Eco Summary Report*, *Reviving Service Centers*, the *ABCs of School Selection*, and various speeches about smart growth, both in hard copy and on the web.

Shoreland Homeowners Guide — A new guide, *Maine Shoreland Zoning, A Handbook for Shoreland Owners*, a highly effective and widely distributed educational tool, was produced by DEP in 1999.

Removal of Overboard Discharges — Maine voters continue to approve bond issues directed towards remediation of water quality problems, financing the Overboard Discharge Removal Program and the Small Community Grants Program. One hundred and sixty-three OBDs have been removed since 1998. Through an innovative approach, the Maine DEP makes funds available to Regional Planning Commissions to assist towns with paperwork, landowner relations, bidding, contract management and oversight of site evaluations and system designs associated with removal of OBDs. This addresses staffing limitations at DEP and acknowledges the reluctance of towns to participate in grant programs due to the work involved. Similarly, the Casco Bay Estuary Project, through an Environmental Protection Agency (EPA) Sustainable Challenge grant, has used the same approach to target and remove 33 overboard discharges in three towns in the Casco Bay watershed.

Significant Barriers to Addressing the Impacts of Development

✍ Although watershed management programs are key to addressing water quality and other environmental impacts on a regional scale; starting, supporting and maintaining these programs requires a significant staff commitment, and a multi-year financial commitment. The strict limitations

for Section 309 program enhancements do not allow for the ongoing support needed to produce ordinance changes at the local level.

- ✍ Maine is lagging behind other states with respect to our use of Geographic Information Systems for planning and coastal management. The state Office of GIS is funded primarily through project fees, so completion of important data layers and infrastructure development for the efficient delivery of data to regional councils and municipalities is limited.
- ✍ The local ordinances of many Maine towns prevent smart growth approaches by requiring large lot sizes and road frontages and wide roads. In addition to regulatory approaches, Maine needs strong incentives and disincentives to encourage Smart Growth.
- ✍ Turnover among CEO's is currently fairly high, particularly as an aging cohort is reaching retirement age. Likewise, turnover among Planning Boards is high, presenting challenges for training programs.
- ✍ Maine's municipalities include many small to mid-sized towns that lack professional planning capacity. It remains a challenge to provide effective planning services to these towns given state and local budgetary constraints. These towns still face a 2003 deadline for assuming responsibility for reviewing development proposals previously reviewed by DEP.
- ✍ The capacity of Maine's regional councils is quite variable. Financial support, professional ability and organizational stability vary widely.
- ✍ Shoreland zoning remains a primary regulatory tool for many communities in Maine. The law is more than 25 years old, and its effectiveness in achieving environmental goals is uncertain.
- ✍ While the provision of mapped information about wildlife habitats for municipal planning has improved, technical guidance for towns has been lacking.
- ✍ With the exception a few places, including the City of Portland, Maine's working waterfront communities have not enacted regulatory and other methods to protect waterfront areas for marine-dependent uses. Under current, good economic conditions, waterfronts are under pressure for redevelopment.

Strategies for Addressing the Impacts of Development

✍ *Administer and Enforce Land Use and Water Quality Laws*

The Maine Department of Environmental Protection and the State Planning Office will continue to implement the state land use laws that control the environmental impacts of development and other land uses in the coastal zone. This strategy includes: public education about the laws; training of local code officers; state permit review; site inspections; and enforcement actions.

SPO and DEP will also work with other state agencies to meet the conditions set by EPA and NOAA to fully approve Maine's Coastal Nonpoint Source Pollution Program. When the program gains full approval, we will work jointly on implementation activities that reduce and prevent nonpoint source loadings into coastal waters.

✍ *Shoreland Zoning Evaluation*

The Shoreland Zoning law has been in existence for more than 25 years. Concerns remain about the effectiveness of the law (e.g. water quality protection, aesthetics, etc.) and the adequacy of municipal administration of the program. An independent evaluation of the law and its implementation will be completed by December 2002. The geographic scope of the study will be statewide, including the coastal zone and including coastal wetlands. Recommendations may pertain to the law's requirements and standards, as well as program administration and enforcement.

✍ *Smart Growth*

Many of the activities mentioned in the preceding management characterization of smart growth are ongoing. Smart Growth is a major initiative embraced by Governor Angus King and the State Planning Office is the lead policy development and implementing agency. Managing a new appropriation of $1.7 million for smart growth programs, passage of new legislative directives, continued pursuit of Maine's innovative market strategy, and implementation of the Smart Growth Task Force recommendations will comprise a huge amount of SPO's workload over the next two years. Among other provisions in the 2000 legislative package dealing with state capital investment, school siting, and related matters, the law calls for:

- ✍ the Land and Water Resources Council to develop recommendations and incentives to keep rural land productive and suitable for traditional uses;
- ✍ development of recommendations to expand brownfield redevelopment efforts; and
- ✍ development of a set of model land use ordinances, a "Smart Growth Tool Box", that will assist municipalities in promotion of "smart growth", siting of development in a manner designed to prevent or minimize the adverse consequences of sprawl.

The Smart Growth Task Force is currently examining the State's growth management and land use laws to identify ways to make them more responsive to issues of smart growth. The task force conducting

this study has authority to introduce legislation to implement its recommendations. New approaches to growth management may be an outcome of this work.

Additionally, new funding sources for the State's Office of Geographic Information Systems may be an outcome of the 120th Legislature, now in session.

✍ *Provide Targeted Technical Assistance to Coastal Towns*

SPO remains committed to an ongoing, annual program of technical assistance to towns. A variety of outreach methods will be employed to cover the following core needs:

- ✍ ongoing training and development of capacity of local planning boards;
- ✍ ongoing training and certification of code officers, including development of new, advanced training modules;
- ✍ development and improvement of local ordinances and standards;
- ✍ improvement of local capacity to enforce certain ordinance standards;
- ✍ timely responses to requests for information in selected policy and ordinance areas;
- ✍ support and professional development for municipal and regional planners.

Additionally, the municipal technical assistance survey conducted in 2000 (discussed in the assessment section) provided detailed information about the planning and information needs of towns. In addition to the coastal-related topics mentioned (predominately access and waterfront planning), high priority needs identified included assistance in impact fee development, capital planning and development of fiscal management tools, assistance with comprehensive planning and ordinance development, visioning and assistance in developing smart growth tools. Municipalities also provided preferences for the second set of technical assistance bulletins to assist them in reviewing mid-sized developments formerly in the jurisdiction of the DEP -- top preferences were stormwater quality, transportation management, good neighbor standards, wildlife and natural areas, easements and development infill strategies. These priorities will be incorporated into plans for publications, workshops, and website materials.

✍ *Coastal Watershed Management Program*

SPO, DEP, DMR and the University of Maine Cooperative Extension have formed an effective team to continue the support of both fledgling and more advanced coastal watershed efforts. To date, there is some combination of pollution source identification, remediation and/or watershed planning occurring in sixteen out of the seventeen designated priority estuaries. Building on this momentum, continued activities will include organizational development and strategic planning for watershed councils, organization of watershed surveys and volunteer monitoring initiatives, assistance with grant writing, education and outreach, and assistance with creating watershed management plans. SPO will also remain active in assisting watershed councils in the designated salmon rivers through activities such as land acquisition (Land for Maine's Future Program), participating in grants selection committees (the 119th Legislature approved a funding package for salmon watershed councils), and providing advice for design of volunteer monitoring programs.

✍ *Working Waterfronts*

As mentioned in the previous section on technical assistance needs, Maine's coastal towns are seeking assistance for waterfront planning and grants for infrastructure development. Preservation of the working waterfront and provision of additional water access for commercial harvesters are important concerns. SPO anticipates the possible creation of a Fisheries and Waterfronts Task Force during the 120th Legislature. In addition to looking at new funding sources for waterfront access and preservation, a "Right to Fish" law and another attempt at a Constitutional Amendment to provide for current use taxation for commercial fishing properties may be possible outcomes of this effort. SPO will provide assistance by:

- ✍ Characterizing land use changes along Maine's working waterfront to bolster anecdotal information
- ✍ Examine previous technical assistance documents on working waterfronts completed in the 1980's. Update and redistribute this information, e.g. model ordinances, harbor planning guidance, pier and dock ordinances and BMPs, etc.
- ✍ Assist Maine DOT with executing another round of Small Harbor Improvement Grants upon passage of a bond issue in November 2001.
- ✍ Proactively assist coastal towns with access planning needs.
- ✍ Explore the creation of new programming and initiatives for working waterfronts, including new funding sources.

✍ *Open Space and Habitat Planning*

Current efforts of MDIFW, the Natural Areas Program, SPO, the Wells Reserve and other partners to bring new information to municipalities about wildlife and bird habitats will continue. Regional wildlife corridors and unfragmented lands, if protected, could provide for significant habitat, provide open space for recreation, and reinforce smart growth patterns by providing "urban containers" around service center communities, imposing a physical limit to sprawl. Current efforts will continue to:

- ✍ pilot a regional habitat protection approach in Southern Maine;
- ✍ assemble maps for other areas;
- ✍ produce technical guidance materials;
- ✍ develop incentives;
- ✍ prioritize public lands acquisition; and
- ✍ introduce the materials to towns, land trusts and other audiences.

PUBLIC ACCESS

Resource Characterization

Extent of Public Access

Maine has a long coast that stretches some 4,568 miles when all of its bays and tidal rivers are factored, with 4,613 islands one acre or more in size. While most of the Maine coast is privately owned, for generations residents and visitors have enjoyed a tradition of free passage over private lands to access tidal waters. This tradition began to unravel three decades ago as coastal land became increasingly attractive for home and business development. With a diminishing amount of coastal access for a range of activities – such as commercial and recreational fishing, hunting, clamming, hiking, wildlife-watching, and boating – the value residents placed on publicly owned lands began to rise substantially in the early 1970s.

Since that time, the state has put in place effective programs to acquire land for public access, and Maine has made significant progress in recent years to protect land along the coast. To date, about 170,000 acres have been protected in the coastal zone towns of Maine, or about 9.8 % of the total area. (Statewide, about 5% of the land area is publicly owned.)

Many organizations have been active in the state, oftentimes working together to acquire land. Year by year, acreage has been protected by the U.S. Fish and Wildlife Service and added to the state's three national wildlife refuges. The Maine Department of Inland Fisheries and Wildlife (DIFW) and the Maine Department of Conservation (DOC) have acquired lands and added them to their wildlife management areas and state parks and reserve lands. Two statewide nonprofit conservation organizations, The Nature Conservancy (Maine Chapter) and the Maine Coast Heritage Trust, have also worked to acquire spectacular properties on the mainland and on islands (many parcels have been transferred to State ownership). Over the past 10 years, more land trusts have been established in coastal municipalities, so that today there are over 50 protecting land at the local level. In total, there are 159,143 acres of state or federally owned land in coastal zone towns, according to the *Conservation Lands Inventory*, State Planning Office, 1997.

Perhaps the most significant development in coastal land acquisition occurred in 1987, when Maine people voted for a $35 million bond to acquire lands of statewide significance. Since it was founded, the Land for Maine's Future Program has acquired 67,000 acres, 16,046 of which are in the coastal zone. The parcels have ranged from small boat launch sites to long stretches of undeveloped coastal headlands. In 1999, Maine people approved a $50 million Land for Maine's Future bond to acquire additional public land.

While Maine is making progress in protecting land for general recreation, conservation, and wildlife habitat, there are gaps. This is particularly true for boat access for recreational and commercial

fishermen. Along its entire coast, there are 74 State boat access sites – those places where the public has a guaranteed right to launch a boat. This averages out to one State site for every 608 miles of mainland shoreline. A total of 56 of Maine's 139 municipalities have State sites (due to the fact that some municipalities have more than one of these sites). According to the DOC – which is responsible for developing and maintaining most of these sites in cooperation with the towns – there is about $1.5 million available each year for boat access site development and refurbishment, but this is not enough to meet all the needs. Another source of capital dollars that has addressed boat access needs has been a 1995 $2.5 million state bond issue. The bond created the Maine Department of Transportation's (DOT) Small Harbor Improvement Program (SHIP) which gave grants to municipalities for 41 public access and harbor infrastructure improvements from 1996 to 1999. SHIP was very well received by coastal communities. It appears as if SHIP will be part of DOT's transportation bond request in 2001. With these two programs, Maine will continue to make steady progress toward creating more boat launch sites and improving marine infrastructure, but it may not be enough to meet demand.

Access Type	**Extent (# of sites and/or # of miles or acres)**
state/county/local parks	State Parks/Reserve Lands: 45,328 acres Municipal Parks: no statewide data available
public beaches	135 beaches
public boat ramps	74 state, 19 municipal
scenic vistas	20 DOT roadside turnouts
state or local designated rights-of-way	no statewide information available
fishing piers	130 estimated
coastal trails	no statewide accurate data available
disabled access	all 15 State Parks accessible
boardwalks/walkways	seven municipalities
other	National Wildlife Refuges: 33,710 acres National Park: 51,209 acres National Estuarine Reserve: 1,600 acres* State Wildlife Management Areas: 27,082 acres

Source and Date of Data

State/county/local parks – *Conservation Lands Inventory*, State Planning Office, 1997 (State information); Public beaches – *Coastal Public Access in Maine* report, Maine Coastal Program, 1990 (local information); Public boat ramps – State ramps: State Sponsored and Assisted Boat Access Sites database, DOC Boating Facilities Program, 2000. Municipal boat ramps: Maine Saltwater Anglers Guide, Department of Marine Resources, 1999. (Note: Those sites identified as "State" sites are those that are State owned and managed or are those owned by municipalities but developed with State assistance. The 19 municipal ramps cited here are those that are open to the general public but have been developed, and maintained, solely by the municipality.); Scenic vistas – Department of Transportation database, 2000. (Note: There is no comprehensive inventory of scenic vistas. Those mentioned here are turnouts on State roads in coastal communities maintained by the DOT. Over the past two decades, local land trusts have been the entities that have protected scenic areas in coastal communities, but no comprehensive inventory of these exists.); Rights-of-way – No statewide data available; Fishing piers – *Maine Port Facilities Inventory and Analysis*, Developed for the State by Southern Maine Economic Development District and Eastern Maine Development Corporation for DMR and DOT, 1999. (Note: Piers and wharves are often used interchangeably, so this number reflects both types of marine infrastructure.); Coastal trails – *Conservation Lands Inventory*, State Planning Office, 1997; Disabled access – DOC Bureau of Parks and Lands, personal correspondence, Fall

2000; Boardwalks/walkways – Personal correspondence with Coastal Program staff, December 2001; Other – *Conservation Lands Inventory*, State Planning Office, 1997. (*Note: NERR site encompasses 1,100 acres of U.S. Wildlife Refuge land.)

Characterize the Demand for Public Access

The ability of Maine residents to gain access to their coastal waters has been a persistent issue over the past two decades. This is particularly true in periods of strong economic growth (mid- to late 1980s and again from the mid-1990s to the present), when coastal land development and the loss of land for public access occur at a more rapid pace.

A 1986 report – *Public Access to the Maine Coast*, prepared by the Maine State Planning Office – noted . . . "For the past ten years, concern has been growing that not enough avenues to reach Maine's coastal shorelands remain. Maine's recent efforts to purchase and develop accessways have not kept pace with the growth of year-round and summertime populations, and thus greater pressure is placed on existing accessways." The *Strategic Plan for Providing Public Access to Maine Waters for Boating and Fishing*, developed in 1995 by the Departments of Conservation and Inland Fisheries and Wildlife, notes that . . . "Demand for public access appears to be rising as participation in boating and sport fishing grows while traditional access sites and affordable shorefront lands suitable for access diminish."

Clearly, public access to Maine's coastal waters is an issue that will not go away, particularly for the state's coastal waters, which support both recreational *and* commercial users. In fact, the need to address the issue will only become more pressing. Below are indicators of the need for public access:

- Opinion Surveys in Year 2000 – To get an indication of the need for coastal water access along the coast, the Maine Coastal Program conducted two surveys in 2000, both of which indicated strong support for increased water access for a range of users:

  1) A mailed survey in the summer to 400 individuals knowledgeable about coastal water access in their communities (harbormasters, municipal officials, water quality monitors, conservation commissions, shellfish commissions, land trusts). One-hundred and fourteen people representing 81, or 57%, of Maine's 139 coastal municipalities responded to the survey. When asked to give an assessment of the overall need for coastal public access in their community or region, 92 people responded, with 59% indicating a High Need for coastal water access, 28% indicating a Medium Need, 13% indicating a Low Need.

  2) A random telephone survey conducted in the fall by Market Decisions, Inc., marketing/public polling firm based in Maine. 410 people from throughout Maine were asked how they felt about the statement, " Maine citizens need additional public access to coastal waters." 28% of the respondents Strongly Agreed with the statement, 35% Somewhat Agreed, 21% Somewhat Disagreed, 7% Strongly Disagreed, and 9% Didn't Know.

- Population and Tourism Growth – With the exception of Washington County, Maine's coastal counties are the fastest growing counties in Maine. For example, according to the Maine

Census Data Center at the State Planning Office (summer 2000), the population of York County grew by 27% (142,268 to a projected 196,743) from 1980 to 2000, and is projected to grow by another 8% over the next decade. Sagadahoc County grew by 26% (29,316 to a projected 37,000) from 1980 to 2000, and is projected to grow by another 8% by 2010. The Maine coast is also the major draw for visitors. According to the Maine Office of Tourism (personal correspondence, summer 2000), visitors made 9.4 million overnight trips to Maine in 1999, with 46% of these trips made to the southern Maine coast and 37% to Greater Portland/Casco Bay. While tourism growth fluctuates with national economic conditions, the Tourism Office expects visitor numbers to the coast will continue to rise steadily over time.

- Growth in Recreational Activities – The recreational use of coastal waters is growing. According to the Marine Recreational Fisheries Statistics Survey (1999), conducted by the Maine Department of Marine Resources and the National Marine Fisheries Service, the number of saltwater anglers in Maine has risen substantially over the past five years. In 1995, there were 249,201 saltwater anglers in Maine, of which 114,060 were Maine residents. By 1999, the number increased by 45% to 361,778, of which 237,000 were Maine residents. There has also been a boom in coastal kayaking, with Maine's long coastline and many islands a growing attraction for resident and nonresident kayak and canoe paddlers. According to the Maine Island Trail Association (personal correspondence), coastal paddling has boomed in Maine and in other states. In Bar Harbor, for example, there was one kayak outfitter in 1991, today there are eight outfitters. The business of Peaks Island-based Maine Island Kayak Company – which offers customers kayak lessons and guided trips – has grown 25 percent annually during each of the past five years (personal correspondence). According to Maine Island Trail Association, its membership has increased 169% from 1,300 members in 1990 to over 3,400 in 1999.

- Commercial Fishing – Commercial fishing continues to be a mainstay of the coastal economy, with total employment estimated at 26,000 people and an annual economic impact on Maine of $770 million, according to the Department of Marine Resources (summer 2000). While there has been a contraction in the groundfishing sector of the industry, other sectors are growing – such as lobsters – or have the potential for growth, such as mussels, scallops, finfish aquaculture, and seaweed. In 1998, SPO and DMR surveyed commercial fishermen on the issue of access. Of the 249 licensed commercial fishermen who responded, 39 % indicated that public access for fishermen is an important issue to address, with others noting it will likely become one in the future.

- Boat Registrations – While the number of registered boats in Maine fluctuates each year with the economy and the weather, registrations have spiked over the past four years. Consistently, the number of registered boats has ranged from 112,000 and 119,000 between 1976 and 1995, with a spike of 132,039 registered in 1989, according to DIFW (personal correspondence, summer 2000). From 1996 through 1999, the numbers have consistently been above 126,000 registered boats, with a peak in 1997 of 133,529. About 45% of boaters use both inland and coastal waters. (This figure includes both recreational and commercial craft.)

Identify Significant Impediments to Providing Adequate Access, Including Conflicts with other Resource Management Objectives

- Private Ownership – Most of the coast is privately owned, and residents do not have rights to travel over private property to access the shore, and public trust rights in the intertidal zone are restricted to three narrowly defined activities , fishing, fowling, and navigation. In addition, providing public access is not required by state permits for development projects.

- Land Costs – Rising land values along the coast is making it more difficult for the State to acquire land for the public. State acquisition programs sometimes cannot compete with the market because they must pay fair market, or below fair market, value for the property.

- NIMBY Syndrome – Community and/or town opposition to boat or pedestrian access sites can be a problem. While most people support increased water access, sometimes they oppose it if it is in proximity to their property.

Management Characterization

Within each of the management categories below, identify changes since the last assessment (this applies to both positive and negative changes)

Management Category	Changes Since Last Assessment
statutory, regulatory, legal systems	none
acquisition programs	significant
comprehensive access planning (including GIS and databases)	significant
operation and maintenance programs	none
innovative funding techniques	significant
public education and outreach	moderate
other	none

Ac
quisition Programs —

- *Land for Maine's Future Program*. This State program was created in 1987 when Maine voters approved a $35 million bond to acquire lands for conservation and recreation and farmland protection. The LMF Program received additional support in the Fall of 1999 when voters approved a $50 million bond to acquire lands of statewide, regional, and local significance. The fund is managed by an 11-member Board, and the Program is coordinated by the State Planning Office. Two of the Board's high priority areas for acquisition include

undeveloped coastal lands and land that will provide water access for boating and fishing. The Board is authorized to spend up to $10 million a year. The $50 million bond gives a significant boost to increasing public access to the coast for a wide range of activities. Funding comes from a bond, which will be retired using State general fund revenues.

Comprehensive Access Planning —

- *Coastal Water Access Priority Areas for Boating and Fishing*. The Maine Coastal Program and the Maine Department of Marine Resources developed, in the fall of 2000, a study that examines the need for public access, particularly as it relates to recreational boating and fishing. A prioritized list of towns/regions that need this type of access was developed. This is the first time that such a list had been created. The report also contains recommendations on how to improve public access for all users (commercial and recreational). Funding came from 309 funds.
- *Land Acquisition Priorities Advisory Committee*. In 1996, Gov. Angus King issued an executive order creating the Land Acquisition Priorities Advisory Committee. LAPAC developed a much-needed land acquisition priority list, which is helping to guide land acquisitions by the State, particularly the Land for Maine's Future Program. Of the five LAPAC focus areas, two relate to public access to the coast. LAPAC calls for the acquisition of undeveloped coastal land and land to be used for boating and fishing access. Funding came from State general fund.
- *Conservation Lands Inventory*. The Maine State Planning Office developed a comprehensive inventory of conservation lands in Maine in 1997. The inventory catalogs public and private conservation lands and easements by geographic region and identifies principal uses and values of each parcel. The inventory includes boating facilities on the fresh and salt waters of the state. An inventory of this scope had never been done before. Its existence has helped the State assess the types of land that are in need of protecting for public use and enjoyment. Funds came from State general fund.
- *Right-of-Way Discovery Grants (CZMA Section 306 funding)*. The Maine Coastal Program continued to provide small grants (up to $1,200) to coastal towns and land trusts to inventory and clear title to public rights of way to the coast. This effort has led to the reestablishment of public access to the coast in several towns.
- *Gas Tax Equity Funding Commission*. In 2000, the State Legislature created this commission to collect and analyze all data on the amount and type of fuel purchased by people operating motorboats and off-road vehicles. Currently, a portion of the tax on recreational motorboat fuels is earmarked for a boat access development and maintenance program within the Department of Conservation (DOC). Among other tasks, the Commission will determine if DOC's boating facilities program is receiving a fair amount of the funds raised from recreational motorboat tax. The findings in the report of this Commission – which is due in 2001 – could result in an increased allocation for DOC's boating facilities program.

- ✍ *Public and Recreational Access to Water Crossings.* This interagency committee, formed in 1999, looks for opportunities to improve angler and boater access at bridges over waterways that are slated to be rebuilt or refurbished by the DOT. To date, the committee has identified numerous bridge rebuilding projects where angler access can be created or enhanced. At the time of submitting this report, there was a proposal to include, in DOT's 2001 bond request, funds for this access work.

Innovative Funding Techniques —

- ✍ *Shore and Harbor Management Fund.* As part of its expansion on the Kennebec River, Bath Iron Works – a shipbuilding company – purchased submerged lands from the State amounting to $1.5 million. The State is expected to receive the funds in early 2001. The funds will be placed into an account managed by the Submerged Lands Program at DOC. Although plans have not been finalized, the Submerged Lands Program Advisory Board – which is composed of private sector, municipal, and state officials – has recommended that interest generated from the funds be used as part of a competitive grant program to municipalities for harbor improvement and water access projects. Funds will probably be made available in Fiscal Year 2003.
- ✍ *The Maine Outdoor Heritage Fund.* Created in the mid-1990s, MOHF began awarding funds in 1997. Its goal is to conserve Maine's special places and provide opportunities for the public to enjoy them. Funds for the program are derived from special lottery tickets. They help fund fisheries and wildlife conservation projects, natural resource law enforcement, endangered and threatened species management and conservation, and the acquisition of public lands for conservation, public access, and outdoor recreation. Public access is an important part of the mission of MOHF, which will award grants to agencies or organizations working to provide or protect public access to Maine's shoreline. Grants are awarded twice a year on a competitive basis.
- ✍ *Small Harbor Improvement Program.* In November 1995, Maine voters passed the $58.9 million Transportation Bond issue. As part of that bond issue, $2.5 million was set aside for SHIP. From 1996 through 1999, this Program funded 41 waterfront and harbor improvement projects in cities and towns along the coast. These projects have promoted much needed public access along the coast, economic development, and coastal infrastructure, including boat launching facilities, floats and gangways, wharfs and piers, and land acquisition. The last SHIP grant was awarded in 1999. Although there is currently no funding, SHIP will be part of DOT's bond request in 2001.

Public Education and Outreach —

- ✍ *Publish ROW Discovery Brochure.* To better promote the Coastal Program's Right of Way Discovery Grant Program, a brochure was published in 1998. It has been distributed widely to towns, land trusts, and conservation groups along the coast. The brochure increased understanding and awareness of this program, resulting in more applications.

- *Revive and Republish Coastal Public Water Access Series*. This series was first published by the Coastal Program in 1989, and consists of four volumes on topics such as liability for landowners allowing public access, how to conduct inventories of scenic areas, how to plan and implement shoreline access, and how to look for forgotten rights-of-way. In 1998, the Coastal Program revived the series. The availability of the series was promoted, and numerous requests have been fulfilled.
- *Publish Waterfront Construction Handbook*. This popular handbook gives guidance to marine contractors and the general public on how to properly construct waterfront facilities, such as piers, wharves, launches, gangways, and other infrastructure. It was first published in 1997 and reprinted in 1998. It is one of the Coastal Program's most popular publications.

Major Gaps to Improving Public Access

- **Pro-Active Steps to Identify Access Sites –** Because coastal lands are being developed quickly and actively in many areas, the State take a more pro-active role in identifying potential sites and working with towns, realtors, developers and local conservation groups on public access land acquisition proposals. The following steps are recommended: 1) Appoint or hire a state staff person (s), or hire a contractor, to work proactively on public water access sites; 2) identify towns and groups that are interested in creating or improving public access sites; 3) determine the availability of suitable land and the most appropriate type of access (boat launch, carry-in, bank fishing); 4) create and maintain a database of information on current State owned or assisted boat access sites; and 5) seek cooperating entities that will agree to become title holders and managers of public water access sites.

- **Policies that Preserve Working Waterfronts –** The water access needs study completed in fall 2000 by the Coastal Program and DMR found that, while there are several statewide programs that address recreational boater and angler access needs, none exists to identify or acquire public water access sites that are important to commercial fishing. During the past decade a number of wharves, piers, and boat launches where commercial fishing was traditionally allowed have been converted to private residential use or yachting marinas. This has put increasing commercial pressure on existing public water access sites. While this issue is not the responsibility of any one agency or board, the State should develop a strategy to meet the specific needs of commercial fishermen. This could be the development or funding of a program that assists municipalities with marine infrastructure (SHIP), or the establishment of policy that protects working waterfronts.

Strategies

1) Continue, and increase, Maine Coastal Program efforts with state agencies, municipalities, and non profits that work on coastal water access –

- ✍ Provide support to the Land for Maine's Future Program on a wide-range of water access projects, including the acquisition of land for boat access sites and seaside parks, trails, and scenic areas; assist with policy and planning development that facilitates the acquisition of coastal lands for public access.
- ✍ Assist DOT with the SHIP (if funded again in 2001) by helping develop grant guidelines and serving on grant review committee; serve on the Public and Recreational Access to Water Crossings Committee; monitor and assist, when necessary, the Gas Tax Equity Study Commission.
- ✍ Implement the recommendations in the report, *Coastal Water Access Priority Areas for Boating and Fishing* (MCP and DMR, October 2000). Work with LMF, DOC, DMR, municipalities, and land trusts to identify proactively sites suitable for coastal water access.

2) Create products and organize conferences that make the public aware of coastal water access issues and current opportunities, which may lead to a change in recognized public trust rights in the intertidal zone.

- ✍ Create an atlas of conservation and public access lands of the state, with an emphasis on coastal lands. Create an online and hard copy version of the atlas.
- ✍ Produce a public access policy bulletin, to be mailed to municipalities and other interested entities, that discusses recent and past court decisions and what they mean for the public. From this, create an easy-to-read publication for the general public outlining public rights in the intertidal zone.
- ✍ Organize a conference on water access for a range of users. Topics to focus on include public trust rights, current access needs and obstacles to meeting them, and other issues.

LOW PRIORITY ISSUES

MARINE DEBRIS

Assessment of Marine Debris in Maine

Marine debris is human-made material that is thrown, dumped or otherwise deposited into the ocean. Marine debris in Maine has been informally surveyed as part of the annual coastal cleanup since 1985. A Coastal Cleanup is a one-day trash collection by volunteers along the Maine coast each fall. Survey results are approximate since data collection is not rigorously controlled, but they are the best indication to date of the types, sources and volume of debris on Maine's coast.

Coastal Cleanup 1990-2000

Year	Miles	Total Weight (lbs)	Average weight per mile
1990	190	29,850	157.1
1991	219	34,137	155.8
1992	165	22,253	134.6
1993	132	17,570	133.1
1994	172	18,871	110
1995	214	32,574	152.4
1996	242	30,806	126
1997	162	33,702	208
1998	271	15,281	56
1999	242	14,925	61.7
2000	267	38,501	144.2

There have been no significant changes in the sources of marine debris or their impacts since the 1997 assessment. Plastic in various forms of packaging, containers and in the form of cigarette filters is a significant impact both in terms of hazards to wildlife and aesthetic impacts. We are also seeing more debris which is a result of commercial fishing activities. Many items such as lobster bands, light sticks and stray lobster traps are found statewide during the cleanup. In 2000 we identified the Downeast region as being particularly impacted by fishing related debris.

Source and Impacts of Marine Debris in Maine

Source	Impact	Primary Type of Impact
Ocean-based:		
commercial fishing	significant	resource damage
recreational boating	moderate	resource damage
galley	moderate	resource damage
operational	insignificant	aesthetic
Land-based:		
miscellaneous trash	significant	aesthetic
sewer systems	moderate	public health
medical	insignificant	public health

Changes in Management of Marine Debris since 1997

The State took a number of actions to address marine debris in Maine over the past few years. These actions are listed in the table below and summarized in the following discussion.

Management Changes Since 1997

Program	Status	CZMA 309 Funds
state/local program requiring recycling	yes	none
state/local program to reduce littering and wasteful packaging	yes	none
state/local regulations consistent with Marine Plastic Pollution Research and Control Act	no	
marine debris concerns incorporated into harbor, port, marina and coastal solid waste management plans	yes	none
education program	yes	none

The 1989 **Waste Management Act** requires businesses with 15 or more employees to recycle corrugated cardboard and office paper. A number of municipalities have also enacted local ordinances that mandate local residential and/or business recycling. Since 1994, Maine state and local governments are required to divert nickel-cadmium batteries for recycling. SPO continues to administer the recycling program.

The **Reduction of Toxins in Packaging** law became effective in 1992. This law focuses on reducing packaging that uses "heavy metals" such as mercury, cadmium, hexavalent-chromium, and lead. It provides incentives to use packaging manufactured from recycled feed stock and packaging that can be reused. Maine is working to implement this law with 17 other states that have this type of law.

The State Planning Office organizes the **Coastal Cleanup** effort to educate the public about marine debris issues. The 2000 cleanup involved over 2,300 participants.

The State Planning Office developed a **marine debris educational display** which is circulated to libraries and exhibited at local fairs. During Coastweek *My Plastic Free Lunch*, a **slide show and program** on marine debris and ways we can reduce our use of plastics and other hazardous packaging, was presented to participating classes.

A **marina handbook**, published by DEP and SPO in 1996, includes guidance on managing solid waste generated by marinas and boaters. In spring 2001, we will implement the **"Good Mate Program"** with assistance from the Center for Marine Conservation. This will target recreational boaters and marinas using publications and other outreach materials which are being tailored to the New England region.

For Coastweek 2000 we **published a new informational brochure** which proved a very effective tool for getting out the information about marine debris and our statewide effort to reduce it.

Beginning in the spring of 2000 we joined forces with the EPA and Center for Marine Conservation to conduct monthly cleanups at designated beaches to study specific debris items and their sources. The **National marine Debris Monitoring Program** study will be conducted monthly over the next four years at seven Maine coastal locations.

Significant Impediments to Reducing Marine Debris

The largest barrier to reducing marine debris is the increasing amount of plastic packaging and containers, and the lack of awareness within the various coastal communities concerning the prevalence of debris. In addition, as we continually see that the most common item is still cigarette filters, we need to grow the awareness throughout our watersheds that these "travel" from many locations and wind up on our beaches.

Commercial fishing debris is still significant along Maine's coastline. One of the most prevalent items is lobster traps that break loose and wash ashore. Efforts to clean the coast of lobster traps have been made, but this effort is somewhat hampered by a statute that prohibits meddling with lobster equipment. In addition, we are finding lubricant and bleach bottles to be very prevalent in our Downeast region where Coastweek has a lesser presence and impact.

Strategies

- Expand the number of volunteers and miles covered in the annual Coastal Cleanup by:
  - working in partnership with public and private organizations to increase the number of volunteers participating in the Cleanup;
  - increasing our outreach to area schools through presentations and Coastweek activities;
  - working with the commercial fishing industry to support local efforts and reclaim lost fishing gear; and
  - find incentives which will address the problems associated with plastic debris in Maine's coastal region.

SITING OF ENERGY AND GOVERNMENT FACILITIES

Assessment

Energy facilities and federal government facilities along the coast of Maine include the following: fossil fuel power plants, hydroelectric facilities, a nuclear power plant (currently in the midst of the decommissioning process), low-level radioactive waste disposal sites, waste to energy facilities and related ash disposal sites, natural gas and oil pipelines, electric transmission lines, mineral, peat, or aggregate mining, Coast Guard facilities, national defense installations, and federal navigation projects.[1]

The following are the primary developments concerning siting of these types of facilities since 1997:

- In October 1997, the Texas Compact became federal law. The Compact was intended to provide for disposal of low level radioactive waste generated in Maine at a site in Texas and thus obviate the need for a disposal site for this type of waste in Maine for the foreseeable future. Soon after its enactment, Texas regulators rejected the license application for the proposed Compact disposal facility. In the absence of any Texas facility, all Maine's low-level radioactive waste has been going to a licensed facility in Utah (large volume, low contamination) and to a licensed facility in South Carolina (steam generators and other higher contaminated material).
- In May 1997, the owners of the Maine Yankee nuclear power plant in Wiscasset, Maine agreed to shut the plant down. In September 1997 Maine Yankee filed a decommissioning plan which was accepted by the Nuclear Regulatory Commission (NRC). Under current NRC regulations, no formal proceeding is triggered by the filing (or acceptance) of a decommissioning plan. As a result, decommissioning got underway promptly with the selection of a decommissioning contractor (Stone and Webster) in the Spring of 1998. By December 1998, a Federal Energy Regulatory Commission (FERC) rate case was completed that provided for the collection from Maine Yankee's owners of annual payments expected to cover actual decommissioning expenses through 2003 by virtue of a multi-party settlement agreement with the Maine PUC, the State's Office of the Public Advocate, the wholesale contract customers of Maine Yankee, and a citizens' group, Friends of the Coast. The decommissioning total was based largely on the bid amount in the successful Stone and Webster bid, with some stranded cost reductions. At this point, Maine Yankee is more than 50% completed with its decommissioning and going forward on time and under budget. A major event is scheduled for May 2001: shipment by barge of the reactor pressure vessel to Barnwell, South Carolina for disposal. Previously, three steam generators were shipped by barge, under Coast Guard and DOT supervision, to a decontamination facility near Memphis prior to shipment to Barnwell.
- In 1998, Maritimes and Northeast Pipeline Corporation and Portland Natural Gas Transmission System secured necessary approvals from the State of Maine and FERC for construction of natural gas pipelines that together link gas resources offshore of Nova Scotia to the natural gas transmission

[1] Issues regarding federal navigation projects are addressed under the topic of coastal dredging in the Ocean Resources Management section.

systems of the United States and Canada. The Maine Coastal Program worked with the Maine Municipal Association in preparing an article explaining and defining the scope and nature of federal preemption under the National Gas Act (NGA) and the federal consistency requirement of the Coastal Zone Management Act in order to improve local officials' understanding of federal, state, and local authorities over natural gas pipeline projects licensed by FERC under the NGA. SPO staff also evaluated and monitored the projects for public policy issues.

- ✍ During this period, FERC and Maine DEP, pursuant to Section 401 of the Clean Water Act, considered numerous applications for relicensing existing hydroelectric facilities in Maine. In 1998, FERC denied a new license for and ordered removal of the Edwards Dam at the head of tide on the Kennebec River, at the owner's expense, due principally to the dam's impacts on anadromous fish, including Atlantic and shortnose sturgeon, American shad, alewife, and Atlantic salmon. Pursuant to a settlement agreement among the dam owner, federal and State resource agencies, the State of Maine, and conservation group intervenors, the State acquired the dam for purposes of its removal and restoration of the andromous fisheries of the lower Kennebec River. In 2000, the State completed removal of the dam and the river's anadromous fisheries have rebounded dramatically.
- ✍ In 1999, the Maine Legislature enacted P.L. 1999 c. 776 (codified in pertinent part at 38 M.R.S.A. §4349-A), which requires that certain State growth-related capital investments and State buildings, such as office buildings and courts, that serve the public, be made or sited in locally designated "growth areas", downtown areas, or other specified areas which are relatively urbanized or developed. The law is designed as a tool to combat sprawl and is an element of the State's Smart Growth Initiative.

Changes in Management Since 1997

During this period the State enacted legislation that deregulated the State's electric power industry. Under Maine's deregulation law, electric power generation is no longer subject to ratemaking and other regulation by the Maine Public Utilities Commission. The law did not change the applicability of State land use and environmental laws, including the Site Location of Development Act, Natural Resources Protection Act, and State air and water quality standards, to power generating facilities. Likewise, local governments still retain authority over the siting of energy-related facilities pursuant to local zoning ordinances and local comprehensive plans. Local planning boards must review applications for developments that are located in shoreland areas and any other areas subject to local ordinances. In sum, these authorities are viewed as adequate to control the siting of these facilities along the Maine coast.

Notable program related changes that enhanced the State's ability to carry out the policies that apply to these projects during this period include:

- ✍ Enactment of P.L. 1999 chapters 739 and 741. These laws are intended to ensure that State environmental and public health interests are addressed through the federal decommissioning and related State regulatory procedures. Chapter 741 establishes State clean-up standards for

decommissioning nuclear power facilities. Chapter 739 clarifies the authority of State officials to monitor and regulate nuclear power plant decommissioning and site clean-up and restoration actions.

- ✍ The State Planning Office continued to provide opportunities to ensure that potential coastal effects are studied and duly addressed through FERC licensing and State water quality certification proceedings. For example, the State Planning Office had the lead role for the State in the effort to secure removal of the Edwards Dam. Maine Coastal Program staff, drawing on other expertise with the State Planning Office, played a significant part in this effort.
- ✍ Due to sharp increases in oil prices, SPO has stepped up efforts to monitor importation and distribution through coastal tank farms and facilities to help the State anticipate supply disruptions.

Significant Needs in Siting Energy and Government Facilities

The State does not have laws or coastal policies specific to offshore natural gas or oil development. A recent Canadian study estimates that there are modest natural gas and oil resource on the Canadian side of Georges Bank. The first ever call for bids under the Oil and Natural Gas Act in Prince Edward Island has been issued for exploration rights on a 35,664 hectare parcel of land located in the eastern part of the Province. Current and potentially foreseeable economic and energy supply conditions could prompt efforts to allow exploration for natural gas on Georges Bank. The U.S. Department of the Interior, Minerals Management Service is initiating preparation of the 5-year OCS leasing plan for 2002 - 2007.

Except where wetlands are impacted, State laws do not require an assessment of alternative locations and designs for projects nor a weighing of social and economic factors in order to issue a permit for these facilities.

Strategies

- ✍ Participate in the Department of Interior's process for development of a 5 year OCS leasing plan for 2002 - 2007.
- ✍ Continue to coordinate state and federal reviews of projects in the coastal zone under the CZMA and NEPA.

SPECIAL AREA MANAGEMENT PLANNING

Special Area Management Plans are one way to address existing or potential coastal resource problems such as coastal water pollution, and habitat degradation. Under federal guidance, a "designated special area management plan" includes an enforcement mechanism to accomplish the plan. Maine has not initiated a formal federal designation of special management areas.

Significant Changes in Special Area Management Planning

While Maine has not pursued federally designated special area plans, two initiatives (funded partially with CZMA Section 309 enhancement funds) are multi-town approaches to improved coastal management -- the Priority Coastal Watershed Program and the Southern Maine Beach Planning initiative. Both of these initiatives are also described elsewhere in this Plan -- see Impacts of Development section and Coastal Hazards section. The following table provides a summary overview of Maine's activities in priority watersheds, southern Maine beaches and other areas since 1997.

Area	Focus	Status	CZMA 309 funding
Saco Bay	coastal erosion	plan completed	yes
Wells Bay	coastal erosion	plan completed	yes
Higgins Beach	coastal erosion	plan underway	yes
Spruce Creek	NPS pollution	survey and monitoring public education selected remediation	yes
Ogunquit River	NPS pollution	dog ordinance pilot monitoring project	yes
Webhannet River	NPS pollution	survey completed management approaches drafted	yes
Scarborough River	NPS pollution	new group formed restoration plan developed	yes
Casco Bay NEP	toxics, habitat	implementation	no
Royal River	NPS pollution	plan development anticipated	yes
Cousins River	NPS pollution	plan development anticipated	yes
Harraseeket River	NPS pollution	NEMO pilot site ordinance review underway	no
New Meadows	NPS pollution	strategic planning survey and remediation	yes
Damariscotta River	NPS pollution	ordinances for NPS control before town meetings 2001	yes
Weskeag River	NPS pollution	survey, remediation	no
Union River	NPS pollution	watershed council, strategic planning, survey, plan likely	yes
Salmon Rivers	habitat restoration	watershed surveys	yes

Works

ps for Watershed Groups — The Coastal Program cosponsored two successful workshops designed to increase the organizational capacity and fundraising capacity of regional watershed and volunteer monitoring groups.

Coordinators Manual — MCP helped fund a Volunteer Coordinator's Manual that will provide volunteer environmental leaders with skills to build support in their towns for regional coastal restoration and monitoring programs.

Major Gaps in Developing and Implementing Special Area Management Plans

- ✍ Maine's strongly independent municipal governments do not have a successful history of working together on cooperative projects, particularly those involving resource management and regulatory approaches.
- ✍ Some regional planning agencies and other regional entities suffer from organizational and fiscal capacity issues.
- ✍ Regional management planning projects are multi-year, costly endeavors.
- ✍ The establishment of a new organization such as a watershed council can be difficult to sustain without ongoing government grants, especially when there are other well established environmental organizations in the region that compete for limited resources.

Strategies

- ✍ Continue to develop the technical capacity of Regional Planning Commissions, Soil and Water Conservation Districts, and others such that they are better equipped to address coastal resource management needs.
- ✍ Help develop alternative models for watershed management that are not dependent on supporting new 501(c)(3) organizations.
- ✍ Widely communicate and celebrate the success of regional planning efforts.
- ✍ Continue current projects in priority estuary watersheds and southern Maine beaches as described in other sections of this Plan.

FISCAL AND TECHNICAL NEEDS

Fiscal

The combination of slower economic growth and rapidly increasing demand for social services currently combine to severely limit state moneys available for natural resource initiatives. Moreover, the most recent Maine economic and budget forecasts suggest that this situation will worsen over the next biennium.

✍ *The Maine Economy*

Over the 1998-2000 period, national economic growth has been exceptionally strong thanks to sound federal monetary policy, increasing returns to productivity from technological advances, and a booming stock market. The Maine economy has shared fully in this fortunate confluence of events.

In the spring of 2000, however, a major stock market correction caused falling prices across all major industries and gains through the remainder of the year were meager. Then, toward the middle of 2000, national economic growth began to slow considerable. In January 2001, the Federal Reserve announced a lowering of the federal funds rate by one-half percentage point amid fears that the economy might be sliding into recession.

In Maine this slowing of growth can be readily seen in the employment and retail sales numbers. Maine payroll employment growth was just under 3% in both 1998 and 1999, while year-over-year growth in October 2000 was only 1.1%. Similarly, taxable consumer retail sales growth in 1998 and 1999 ranged between 8% and 9%, but the October 2000 sales total was only 4.4% above the year-ago figure.

According to the October 2000 forecast of the Maine Consensus Economic Forecasting Commission (CEFC), payroll employment growth in 2001 will be only 1.1%, compared to about 2.3% in 2000. Slower employment growth will likely mean slower growth in incomes and consumption spending. Further, the CEFC forecast for Maine assumes that national economic growth will slow in 2001 but not turn negative into recession, and this may prove optimistic.

✍ *The Maine State Budget*

In recent years, about three-fourths of Maine State government appropriations have gone for education, health, and human services programs. With no changes in benefits, Medicaid expenditures have been driven up by rising drug prices, increases in nursing home costs because of an aging population, and increases in behavioral health services for children and adults. As a result, Governor King's budget proposal for the next fiscal biennium (2002 and 2003) called for raising the cigarette tax by 26 cents a pack and using tobacco settlement money to offset a projected $200 million shortfall. In a press

conference, the Governor lamented that while he wanted to provide more money for higher education, the need to cover Medicaid cost increases precluded this.

Thus the rising costs of essential education and health services are forcing tax increases and the use of one time moneys to close the gap, leaving environmental programs with very modest "cost-of-living" increases. It appears unlikely that this situation will change in the near future unless there is a major slowdown in health services cost inflation.

✍ *Efforts to Secure Alternative Funding*

Maine Outdoor Heritage Fund — The Maine Outdoor Heritage Fund , created in 1994, receives revenue through proceeds from lottery ticket sales; grants are awarded twice a year. A seven-member board oversees the program and selects projects in four categories that promote public access to outdoor recreation as well as conservation of Maine's "special places", important fish and wildlife habitat, and natural resources law enforcement.

From Fall 1998 to Fall 2000, the Maine Outdoor Heritage Fund Board awarded 133 projects a total of $3,491,430.00. During this time period, coastal projects received approximately 27% of the grant funds. There are no known changes which will significantly change or eliminate the operation of the MOHF program and its role in making funding available for projects that conserve lands and habitats for Maine's citizens and wildlife. Some of the Outdoor Heritage funds obtained by SPO include: an award to establish a program for monitoring of conservation easements on state conservation lands, a grant to support the development of the Gulf of Maine Undersea Landscapes poster and website, an award to produce and air the Sea and Shore radio series, and a grant to establish a (septic system) training site for Code Enforcement Officers.

Land for Maine's Future Program — The Land for Maine's Future Fund was revitalized in the Fall of 1999 when Maine voters approved a $50,000,000 bond to finance the acquisition of lands and interests in lands for conservation, water access, outdoor recreation, fish and wildlife habitat, and farmland. The Land for Maine's Future Program at the State Planning Office is responsible for all activities relating to acquisition projects.

The Legislature made several key changes to the mandate of the Program in response to the needs voiced by the public. These are summarized as follows:

- ✍ **$**25 million from non-LMF sources is required to match the $50 million available through LMF;
- ✍ Federal funds can be used as matching funds;
- ✍ 10% of the $50 million is provided for the Public Access to Maine Waters Fund;
- ✍ Up to 10% of the $50 million must be made available to protect farmland;
- ✍ Sites of local and regional significance may now be considered;
- ✍ In unorganized territories, approval of county commissioners is required if the value of the land project proposed for acquisition exceeds 1% of the state valuation of the county.

Public access is a core purpose of the Land for Maine's Future Program. All lands acquired through the LMF are open to the public. Exceptions may include farms, where access may not be possible, and locations where species management takes precedence or public safety may be at risk. Five percent of the appraised value of any project can be applied towards developing public access facilities, including boat launching sites, parking, camping, trails.

The Public Access to Maine Waters Fund, created in 1993 by the Legislature, was funded for the first time in the fall of 1999 with the voters approval of the LMF $50 million bond. The Public Access to Maine Waters Fund is designed "to get people to the water". The LMFB accomplishes this by acquiring fee simple or public access rights on small parcels of land to create access points to coastal waters, lakes, ponds, and rivers. Lands for access could support a facility for trailered boats or small craft (canoes, kayaks) and provide bank fishing (shoreline angling and wading), clamming, worming, nature study. Access is intended for general public use but may be used by those requiring it for commercial purposes, provided that such commercial use does not interfere with general public use.

In 1998 the Maine Legislature appropriated $3 million to the LMFB to buy land and easements for conservation, recreation, and farmland protection. Fourteen projects were selected from a list of 53 nominations for further negotiations. Of the 14 projects selected, five were located within the coastal zone. LMF has closed on three of these projects: Scarborough Beach, Thorne Head, Ducktrap River - LaCombe; the remaining 2 projects are in negotiations. The projects reflect over 26% of the available LMF funds. For the LMFB September 2000 round of proposals, the LMFB has not made final selections at this time. It is expected that the Board will select finalists in February 2001. Coastal acquisitions should continue to be well represented in LMF's project portfolio.

Additional Sources — Coastal program staff routinely apply for grants to supplement existing project costs, or to fund new initiatives. Recent successes include grants from the Gulf of Maine Council on the Marine Environment, the Davis Conservation Foundation, and the Dolphin Trust. The Program has a long-standing relationship with the Maine Community Foundation -- MCF manages the Shore Stewards Fund and makes grants available for coastal monitoring and outreach activities. Another Coastal Program initiative, The Penobscot Bay Stewards Program, has established a development committee and is seeking 501(c)(3) status. The Stewards' development plan seeks to increase member, foundation and other private contributions to the Program.

The Coastal Program has been successful in competing for Coastal Services Center fellowship awards, hosting two fellows since 1998 and anticipating the selection of another in 2001. Existing staff resources are routinely supplemented by the use of interns and Americorps members.

Technical Needs

Most strategies in this Plan can be accomplished by existing staff in the Maine Coastal Program and its partner agencies. There are some tasks that will require technical skills that are not available in State government (e.g. field scientists, local project coordinators, etc.). As the policy of the current administration is to "not increase head count" within state government, we intend to contract our for these services as they are needed.