



Marine Science for Maine People

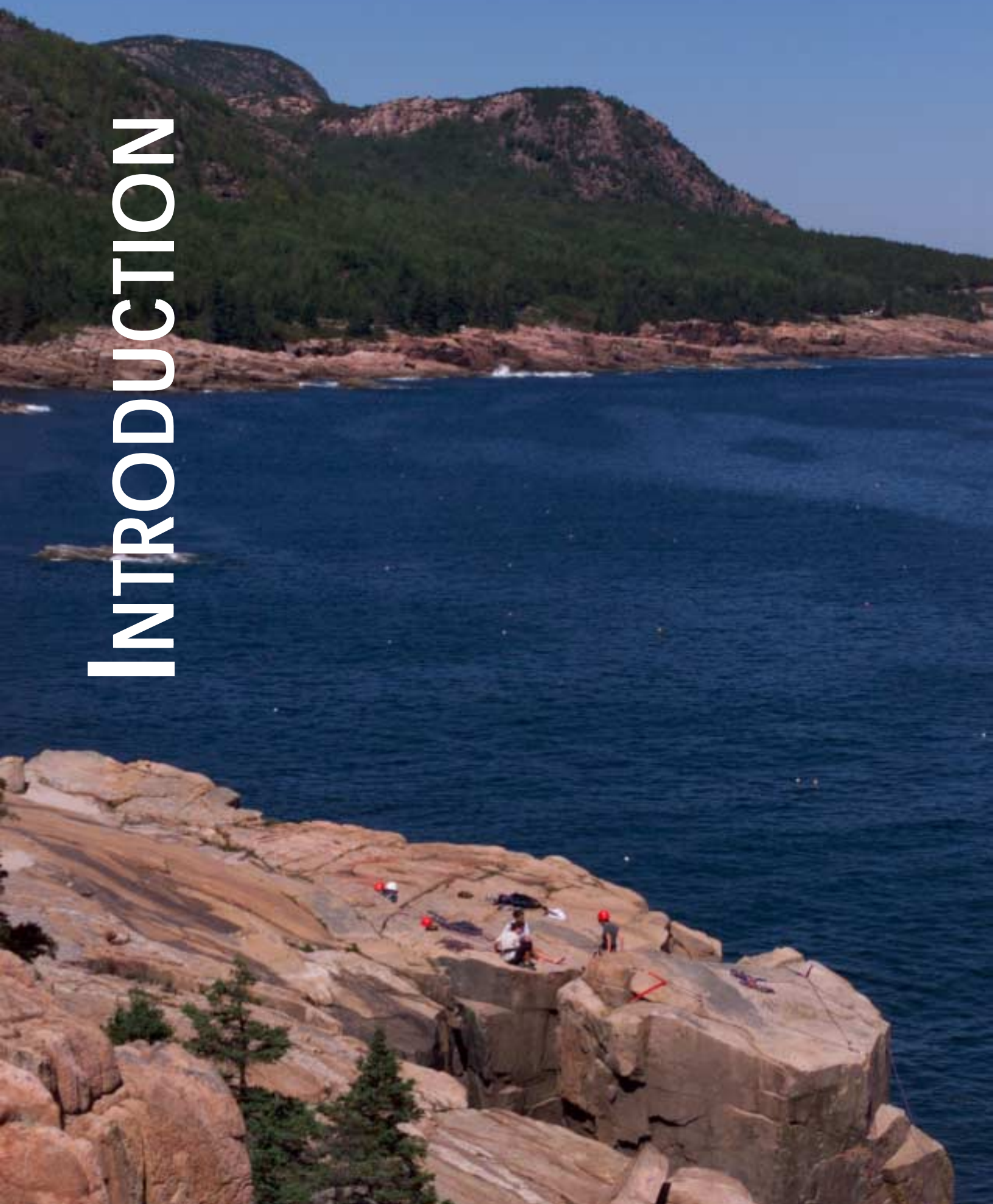
**Strategic Plan 2001-2005 &
Implementation Plan 2001-2003**

Maine Sea Grant

TABLE OF CONTENTS

Introduction	p. 2
Overview and Mission Statement	p. 3
The Marine Environment	p. 3
Marine Industries	p. 6
Fishing	p. 7
Aquaculture	p. 9
Policy and Management	p. 10
Research and Education Infrastructure	p. 10
Maine Sea Grant	p. 12
Development and Organization of Plan	p. 13
Theme Areas	p. 14
Ecosystem Health	p. 15
Aquaculture	p. 22
Fisheries	p. 27
Program Areas	p. 30
Management	p. 31
Research	p. 35
Communications	p. 40
Education	p. 43
Summary	p. 46
How The Plan Was Written	p. 47

INTRODUCTION





Overview and Mission Statement

The Strategic Plan is intended to guide the Maine Sea Grant Program from February 2001 to January 2005 as we pursue our mission ***to play a leadership role in marine science research and education and to promote their use for the development, management, and stewardship of marine and coastal resources.*** This document also contains a two-year Implementation Plan (February 2001 to January 2003) that outlines specific projects and strategies designed to achieve the objectives outlined in the Strategic Plan. The Strategic Plan will be revised in 2002 to incorporate the second two-year Implementation Plan (February 2003 to January 2005). The Sea Grant staff developed the Strategic and Implementation plans in collaboration with our Policy Advisory Committee of stakeholders. Our success over the next four years will be measured not by the degree to which we have completed the tasks in the plans, but by our ability to positively impact the lives of the people of the state of Maine, the Northeast region, and the nation. We anticipate that elements of the plans will be modified as we face new issues and opportunities, evaluate the effectiveness of our programming, and receive ongoing input from our stakeholders.

The Marine Environment

Maine has over 4,500 miles of coastline and more than 4,600 islands. Most of the coast is rocky, but there are many sandy beaches, sand dunes, salt marshes, estuaries and mudflats, each supporting different and important communities of animals and plants. The Gulf of Maine is a highly productive, semi-enclosed sea bounded by Cape Cod to the south and Nova Scotia in the north, and separated from the open Atlantic Ocean by Georges Bank. Maine's long and diverse coastline is an immensely valuable resource for the people of the state and the nation. In addition to supporting valuable fisheries and an important aquaculture industry (which are identified as distinct themes in this plan), Maine's coast provides a wealth of other ecological and societal benefits. The ecosystem health theme in this plan focuses on the many interactions between humans and the marine and coastal environment, and on the sustainable functioning of coastal communities.

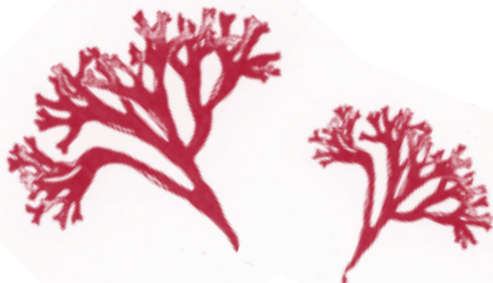
Nearly 44 percent of Maine's 1.2 million people live in the coastal zone, which accounts for 12 percent of the state's area. The coastal population has increased rapidly, and this trend is expected to continue. The environmental impacts of the rapid population



growth are exacerbated by urban sprawl. For example, the Portland metropolitan area increased from 96 to 626 square miles between 1960 and 1990. There is a distinct gradient in coastal population density along the Maine coast, with many more people in the rapidly growing southern part of the state. Between 1980 and 1996, the population of York and Cumberland counties increased by more than 30 percent, whereas that of Washington County grew by only 1 percent. Many of the issues in the eastern part of the state are related to the need to stimulate economic development, whereas people in southern Maine are more likely to be concerned with the impacts of rapid growth and development. In addition to environmental impacts, population growth frequently leads to conflicts between traditional and new users of the marine environment, typified by the loss of working waterfront to residential or other economic uses.

Humans have many impacts on the coastal and marine environment. One of the most important impacts is habitat loss or degradation, resulting from commercial and residential construction and the associated infrastructure. Maine may have lost as much as 50 percent of its salt marsh area, and the productivity of many remaining marshes is compromised by man-made tidal restrictions. Many of the most sensitive and threatened coastal ecosystems, such as salt marshes, sea grass beds, estuaries, and sand dunes, play an important role in the overall ecology of the Gulf of Maine. Although Maine enjoys a reputation for a relatively pristine environment, there are several pollution hot spots, as well as a variety of nonpoint source problems. Casco Bay is heavily impacted by Portland, Maine's largest city, and the surrounding area and shares similar problems of contaminated sediments and nutrient enrichment with many other urban harbors. Other issues include localized mercury contamination, bioaccumulation of dioxin and other industrial contaminants, and sewage contamination of coastal waters.

Maine's coastal communities are susceptible to a variety of natural hazards, ranging from hurricanes to coastal flooding, as well as longer-term factors such as sea-level rise. Marine communities and industries depend upon an extensive physical infrastructure, including docks, piers, and boat launches, some of which are decaying and need to be renovated or replaced. Preservation of existing structures is critical because the development of new facilities is limited by environmental considerations. There is also a need to assess the environmental impacts of existing structures and, where



Irish moss (*Chondrus crispus*)



necessary, design solutions to problems that have been created. For example, many of the erosion problems on southern Maine beaches are exacerbated by engineering structures that disrupt the natural movement of sand.

The rapid growth in Maine's coastal population has major environmental and social implications, and has largely outpaced the ability of coastal communities to prepare. Coastal resource policy has continued to focus on case-by-case review rather than long-term planning. As a result, dramatic changes in land use patterns have been permitted without consideration for the social and ecological ramifications. Decisions about land use, development, zoning, and other issues are complex, and local communities and state regulators are often forced to make decisions without adequate information.





Marine Industries

Maine ranks among the nation's leaders in both the landed value of the wild-capture fishery and aquaculture production. The total value of marine-based industries in Maine is more than \$2 billion (1996), accounting for approximately 7 percent of the total state economy. Marine-related military activity and warships built at Bath Iron Works account for almost half of this total. Tourism is the largest sector of the state's marine economy, generating almost \$800 million for the coastal counties of the state. It is uncertain what percentage of coastal tourism is marine-related as opposed to, for example, shopping in outlet malls in Kittery and Freeport. However, marine-based recreation, such as sportfishing and boating, as well as the environmental and scenic appeal of Maine's largely unspoiled coastline (e.g., Acadia National Park) are undoubtedly major contributing factors. Tourism potentially impacts marine natural resources. Even apparently environmentally benign activities, such as kayak tours of offshore islands, can have adverse impacts when large numbers of people are involved.

Sector	Value-Added (Contributions to GSP)				
	Wages	Profits	Property Income	Business Taxes	Total Value-Added
<i>Commercial Fishing</i>					
Landings/harvesting	15.10	99.99	76.03	6.52	197.64
Canned/cured processing	16.16	-0.08	3.12	0.42	19.62
Fresh/frozen processing	14.49	-0.05	2.90	0.66	18.00
Fishery services	4.26	14.53	2.89	0.95	22.63
Fishery wholesale trade	29.40	1.13	9.89	11.58	52.00
Total	79.41	115.52	94.83	20.13	309.89
<i>Recreation and tourism</i>					
	447.92	54.05	119.28	166.25	787.50
<i>Water Shipping and Transportation</i>					
	22.51	-2.54	5.91	2.61	28.49
<i>Boat and Ship Building</i>					
Boat building	34.42	0.94	-0.63	1.04	35.77
Military ship building	370.01	14.76	-3.47	7.84	389.14
Non-military ship building	11.14	0.66	-0.01	0.26	12.05
Total	415.57	16.36	-4.11	9.14	436.96
<i>Military Activity</i>	299.62	0.00	201.88	0.00	501.50
<i>Miscellaneous Marine Activity</i>	18.00	0.50	1.00	0.50	20.00
Grand TOTAL	1,283.03	183.89	418.79	198.63	2,084.34

Table 1. Economic Activity in the Maine Marine Economy, 1996 (Millions of Dollars)

From: *Maine Policy Review*, Fall 1999 – Vol.8, No. 2. *Measuring Maine's Marine Economy*, by Brian Roach, Jonathan Rubin and Charles Morris. P.58.

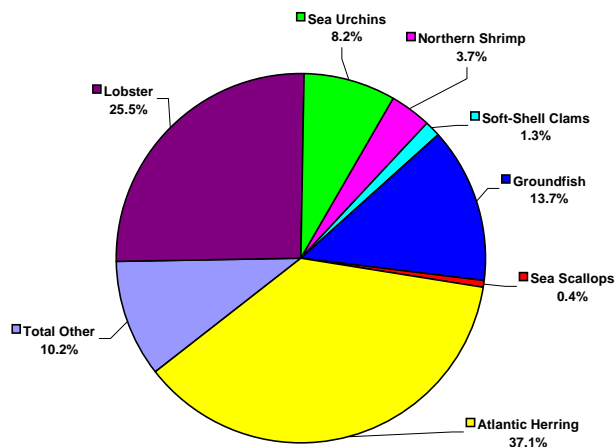


Fishing

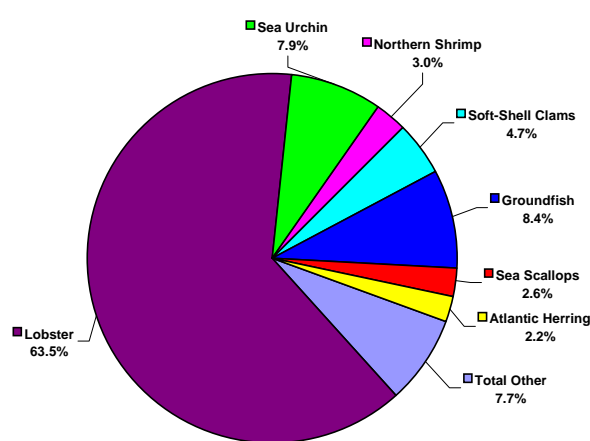
Many coastal Maine communities depend upon commercial fishing for their prosperity, much as they have for the better part of two centuries, and the industry currently supports 26,000 jobs. Species of finfish, seaweed, mollusks, crustaceans, and a variety of other invertebrates are harvested from the sea. Maine has the most valuable fishery on the East Coast. In 1999, Maine landed nearly 257 million pounds of commercial fishery products with a value of more than \$323 million. Marine recreational fishing is also an important industry in Maine, estimated to be worth \$20 million a year.

Maine's most valuable fishery is lobster. More than 7000 lobster licenses were sold in 1999, resulting in landings of more than 52 million pounds at an estimated value of \$180 million. Although lobster landings have increased since 1989, with each of the past three years being records, there is considerable concern over the long-term stability of the fishery, and considerable disagreement among state, academic, and federal scientists on management strategies. In contrast to lobsters, many other fisheries—including cod and haddock, soft-shell clams, and sea urchins—have experienced serious declines. This has increased pressures on once overlooked species such as bait worms, sea cucumbers, elvers, periwinkles, and seaweed. Understanding the effects of fishing pressure on commercially harvested stocks and developing ways to achieve sustainability and ecosystem-based

Maine Commercial Landings 1998
Total POUNDS 184,094,735



Maine Commercial Landings 1998
Total VALUE \$215,957,584



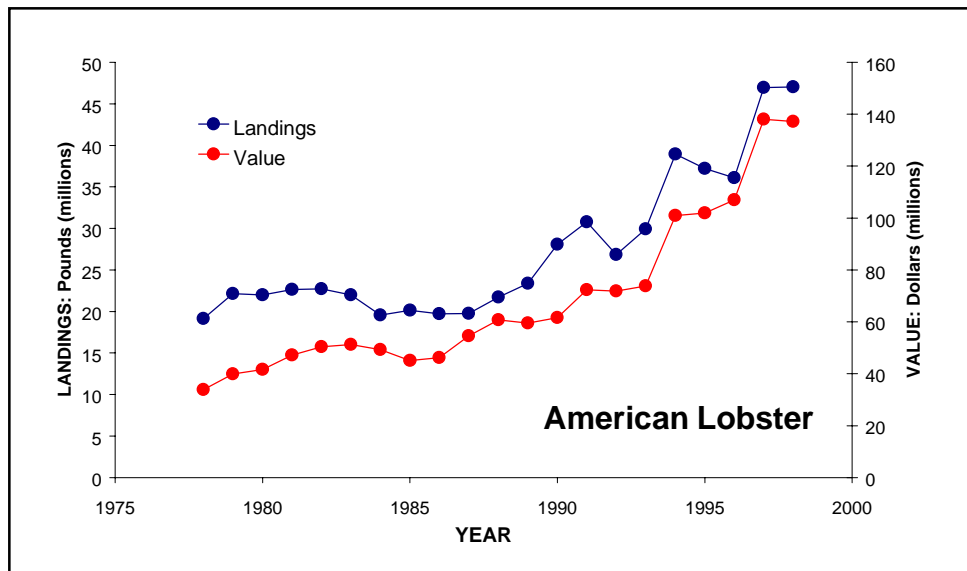
FINFISH WEIGHTS ARE "LIVE POUNDS" ; SHELLFISH WEIGHTS ARE ESTIMATED POUNDS OF MEATS
Data provided by National Marine Fisheries Service and Maine Dept. of Marine Resources

Data provided by National Marine Fisheries Service and Maine Dept. of Marine Resources



management are continuing challenges for fishery managers. Understanding the social pressures on Maine's fishing communities is equally important, as competition for marine resources by aquaculture, recreational fishing, residential development, and other industries increases along the coastline from east to west.

One of the complicating factors in managing Maine's marine resources is that landings are harvested from both state and federal waters. The majority of lobsters are harvested within the state's three-mile jurisdiction, whereas most groundfish are captured farther offshore. Maine is a leader in developing new management practices that involve industry members in decision-making. Clam management has been delegated to coastal municipalities that have the authority to implement conservation strategies, including closed areas, limits on the number of licenses, and requirements for harvesters to participate in conservation activities. In 1996, a Lobster Advisory Council of delegates from the seven Lobster Management Zones was charged with providing input to the Maine Department of Marine Resources commissioner on issues related to lobster management, including limited entry, trap number, traps per trawl, and days at sea.



Data provided by Maine Department of Marine Resources



There is growing interest in similar local or sub-regional management efforts that would allow the fishing industry and government to jointly make policy about harvest practices for several species in a specific region. This ecosystem approach may be a better way to understand how fish populations respond to human intervention and selective harvesting. However, local management is clearly not a panacea and, in the case of soft-shell clams, harvests have remained at low levels despite a considerable increase in the acreage open to harvesting. Experience with the Lobster Zone Management process also suggests that the fishing industry needs help to develop the capacity to become involved in democratic self-management.

Aquaculture

In 1998, Maine was responsible for two-thirds of the total aquaculture production in the Northeast U.S. (worth \$91.2 million), and ranked fourth nationally with \$66.6 million in farm gate value. Atlantic salmon dominates Maine's aquaculture industry, with a production of about 30 million pounds (1998), valued at approximately \$60 million. The industry directly supports 1100 jobs, mostly in Washington County. Maine also has a significant and growing shellfish aquaculture industry, estimated to be worth \$6 to \$8 million. The majority of the cultured shellfish harvest is blue mussels, but there are an increasing number of small companies growing other species, including oysters, scallops, and several species of clams, as well as hatcheries that produce seed for other growers in Maine and elsewhere. There is also considerable interest in commercializing new species, including sea urchins and alternative species of finfish, such as cod, haddock, and halibut.





Policy and Management

In Maine, the Department of Marine Resources is responsible for managing and regulating living marine resources, based on legislation developed by the joint House/Senate Marine Resources Committee. Other state agencies with interest in marine issues include the State Planning Office/ Maine Coastal Program, the Department of Environmental Protection, the Bureau of Parks and Lands, the Department of Conservation, and the Department of Inland Fisheries and Wildlife. Federal agencies that have responsibility for Maine's marine resources include the National Marine Fisheries Service, the Atlantic States Marine Fisheries Commission, the Environmental Protection Agency, Fish and Wildlife Service, and the Food and Drug Administration which regulates therapeutants used by the aquaculture industry.

Research and Education Infrastructure



The Department of Marine Resources has a research laboratory at Boothbay Harbor whose major focus is monitoring (e.g., for fecal coliform bacteria or harmful algal blooms for shellfish safety) and stock assessment for management purposes. The Bigelow Laboratory for Ocean Sciences is an internationally recognized private research institution that maintains several facilities, including the Provasoli-Guillard National Center for the Culture of Marine Phytoplankton. The School of Marine Sciences at the University of Maine has 45 marine faculty members and generates from \$4 to \$6 million a year in funded research. The University of Maine's Darling Marine Center has 10 resident School of Marine Sciences faculty members and supports research by other University researchers, as well as a considerable number of visitors. The University of Maine has also recently acquired the Center for Cooperative Aquaculture Research in Franklin, Maine. Although Bigelow and the University of Maine represent the major concentrations of academic marine research expertise





and attract the vast majority of research funding, a considerable number of other institutions also have faculty engaged in marine research. These include Maine Maritime Academy, other campuses in the University of Maine system (e.g., the Marine Law Institute at the University of Southern Maine) and private undergraduate colleges (College of the Atlantic and Unity, Bates, Bowdoin, and Colby Colleges). Several institutions—including the University of Maine, Maine Maritime Academy, and the University of New England that has a formal partnership with the Bigelow Laboratory for Ocean Sciences—offer undergraduate degrees or courses in marine science. Opportunities for graduate education are more limited. Bigelow and the University of New England offer a joint Masters program in marine science and the School of Marine Sciences at the University of Maine offers Masters and Doctoral degrees in marine biology and oceanography and a Masters degree in marine policy.

A 1998 survey of Maine’s K-12 teachers indicated that more than half of them incorporate marine science into their courses. The same survey also revealed a need for current, relevant, and scientifically accurate classroom resources in marine science that align with the Maine *Learning Results*. Adopted in 1997, the *Learning Results* plan identifies both a philosophy of educational goals for Maine students and specific content standards. The science content standards, in particular, respond to national calls for science education reform. Although there are numerous sources for marine educational materials and informal field trips in Maine, few of these provide teachers with comprehensive information and programming that aligns with the *Learning Results*. Even fewer address the need to improve opportunities for teachers and students to engage in hands-on research.





Maine Sea Grant

Maine Sea Grant is a unit of the University of Maine, the flagship campus of the University of Maine System. The University of Maine is the state's Land Grant College and the only research university and doctoral degree-granting institution in the state. Until 2000, the University of Maine shared Sea Grant College status with the University of New Hampshire, as part of a joint Maine/New Hampshire Sea Grant College Program. In October 2000, Maine became an independent Sea Grant institutional program. Maine Sea Grant is one of the smallest programs in the national Sea Grant network, with an annual federal budget of approximately \$940,000 (2001/2002). Approximately one-half of the total budget is spent on funded research; the remainder supports management, communications, extension, and education programs. Maine Sea Grant currently employs 10 staff.

In addition to Sea Grant, Maine has two other NOAA-supported agencies. These are the Maine Coastal Program, part of the State Planning Office, and the Wells National Estuarine Research Reserve. A 25-member policy advisory committee, representing all of the major stakeholders, guides the activities of Maine Sea Grant.

In 1998, Maine Sea Grant increased the number of extension field agents (from one) to three who cover the Downeast, midcoast, and southern regions of the state. Marine-related extension work at the University of Maine has also recently been strengthened by the development of a memorandum of understanding between Sea Grant and University of Maine Cooperative Extension to create a unified Marine Extension Team of five Cooperative Extension staff and three Sea Grant extension agents, all supervised by the Sea Grant/Cooperative Extension marine extension leader. The partnership with the U.S. Department of Agriculture, through Cooperative Extension at the University of Maine, has leveraged increased funding for the marine extension program and considerably increased our capabilities and impact. ■





Development and Organization of the Plan

The Strategic and Implementation plans are intended for program staff, stakeholders, scientists, and others who seek support from Maine Sea Grant for research, extension, communications, or development activities. The plans will help Sea Grant staff define their individual plans of work and respond to the many diverse groups that seek support from Sea Grant. Because Maine Sea Grant is not able to effectively address every issue, our strategy is to focus on those priority areas that closely match our capabilities.

This document combines the Strategic Plan for the four-year period from February 2001 to January 2005, with the two-year Implementation Plan for February 2001 to January 2003. The combined plans are organized into two sections: theme areas and program areas. Theme areas include ecosystem health, aquaculture, and fisheries. Our program areas are management, research, communications, and education.

The themes represent the major areas in which Maine Sea Grant will be engaged over the next four years, and they are intended to focus and organize the program's activities in these areas. The program areas are overarching elements that are not specific to one of the theme areas. Extension activities are integral to all of the themes and are therefore not described separately.

Each of the theme and program areas outlines several goals and objectives that form the basis of the Strategic Plan. The Implementation Plan contains specific strategies intended to achieve these objectives over the two-year period from February 2001 to January 2003, and these are described in tables that outline the planned activity, anticipated outcomes, and evaluation methods.

Maine Sea Grant is organized into management, research, communications, and extension components. The organizational structure increases efficiency by allowing staff to specialize and work within clearly defined job descriptions. However, it is important to emphasize that Maine Sea Grant is a single program with a coherent overall mission, and that it is the collective responsibility of all staff members to help meet the goals and objectives outlined in this plan.



THEME AREAS






Ecosystem Health


Goals

The overall goals in Ecosystem Health are to:

 *Provide science-based information to help preserve the coastal environment and human communities.*

 *Stimulate the sustainable development of marine industries.*

 *Promote citizen involvement in environmental stewardship.*

 *Help coastal communities deal with issues concerning land use planning, environmental protection and management, and use conflicts.*

We will work towards these goals by addressing the following objectives:

Objective EH-1

Develop a working definition of marine and coastal ecosystem health, establish ways in which it can be measured, and identify where more information is required.

Rationale

The rapid growth of Maine's coastal population has resulted in increased stress on coastal ecosystems, ranging from habitat loss and degradation to pollution. Maine Sea Grant will facilitate discussions among key players to develop a working definition of coastal ecosystem health, and establish parameters by which it can be measured. Many agencies, organizations, and communities are engaged in similar exercises; for example, the U.S. Geological Survey and National Park Service are working to develop "vital signs" to assess the status of public lands. There is a need to coordinate these efforts to develop coherent criteria. Sea Grant can promote science-based discussions that will include environmental, social, and economic perspectives. The challenge is to focus our limited resources on those issues where Sea Grant can have the most impact. This may require developing relationships with stakeholder groups that have not previously been connected to Maine Sea Grant, and it may also be necessary to obtain new resources. The recent alliance, between Cooperative Extension and Sea Grant to create the Marine Extension Team, provides a greater capacity and significant experience for addressing some of the important coastal issues. Finally, we will utilize the expertise of other Sea Grant institutions that have successful programs in those areas that we plan to develop.



IMPLEMENTATION 2001-2003		
Objective EH-1: <i>Develop a working definition of coastal ecosystem health, establish ways in which it can be measured, and identify where more information is required.</i>		
Strategies	Anticipated Outcomes	Evaluation
A. Facilitate a series of meetings with agencies, communities and researchers to help define coastal ecosystem health, and to identify practical metrics to assess it in Maine.	A report will be produced that establishes (a) a clear and useful definition of coastal ecosystem health, (b) recommended metrics to assess ecosystem health, and (c) a list of research priorities to develop new methods.	Track distribution of the report and adoption of definition and recommendations by coastal communities, agencies, and researchers.
B. Organize workshops with researchers, agencies, and coastal community leaders to identify information and data gaps for monitoring ecosystem health.	A report containing a prioritized inventory of data gaps and strategies to obtain the required information will be developed.	Track use of report by researchers in developing research proposals, and in community-based science initiatives (see objective EH-2).
C. Assess the information needs of coastal communities through regular contact with participants in existing programs and specially designed forums.	New extension programs in environmental monitoring will reflect community priorities and needs.	Track the number of new science-based programs developed in response to community identified priorities.

Objective EH-2

Help develop and support volunteer-based, environmental monitoring programs to collect information required by researchers, regulators, and local communities.

Rationale

There are many opportunities for citizens to collect the information required for local or statewide management of marine and coastal resources. Opportunities also exist to develop partnerships with researchers to investigate a wide range of scientific questions related to coastal ecosystems. Examples of monitoring projects suitable for citizen involvement include: habitat restoration, water quality, harmful algal blooms, sand movement on beaches, swimming beach water quality, and storm water impact. State and local government shares the responsibility for tracking these complex issues, but frequently lacks the resources to collect information at the required geographic or temporal scale.

Establishing volunteer-based monitoring programs is challenging in terms of organizing groups, providing technical and scientific support, and managing the information



collected. Experience with the successful Department of Marine Resources water quality monitoring program suggests that volunteers remain enthused about participating when they feel their efforts are making a difference. It is important that partnerships with the data users be established during the design of these monitoring programs so that the right scientific questions are asked, the methods used are appropriate, quality control protocols are implemented, and the resulting data are managed in a manner that maximizes their utility.

The Marine Extension Team will continue to cultivate these partnerships and help build capacity for community groups to manage themselves. The Marine Extension Team can also help identify and create new programs to answer existing questions. The recent creation of the Shore Stewards Program—an alliance of the Maine Coastal Program, the Department of Environmental Protection, the Department of Marine Resources, Cooperative Extension and Sea Grant—provides a wider support network for community-based monitoring programs. Collectively, this alliance is working on many projects and, with proper planning and coordination, will work to develop other opportunities to engage coastal communities in the collection of scientific information for well-defined objectives.





IMPLEMENTATION 2001-2003 Objective EH-2: <i>Help develop and support volunteer-based, environmental monitoring programs to collect information required by researchers, regulators, and local communities.</i>		
Strategies	Anticipated Outcomes	Evaluation
A. Use reports on information needs for monitoring ecosystem health (see Objective EH-1) to develop pilot projects for new citizen-based monitoring programs and assess feasibility.	New full-scale monitoring programs will be developed, including protocols for collecting and processing samples and analyzing data.	Follow progress of projects and survey participants and potential end users of information to evaluate utility of data.
B. Conduct a series of forums for researchers, biologists, and citizens to develop standardized protocols and strategies for citizen-based monitoring programs.	Training manuals and other communications tools, outlining strategies and protocols for specific citizen-based monitoring programs, will be developed.	Record requests for manuals and their adoption by monitoring groups; and survey data users about the format, quality, and utility of resulting data.
C. Support ongoing monitoring programs and citizen groups by providing access to new technology, training (see strategy B), and education; organizing meetings and workshops; recruiting new volunteers; and engaging researchers and agency staff.	Current citizen-based science programs will continue to play an important role in monitoring the coastal environment.	Track number of programs and participants and survey volunteers and end users of information (e.g., state agencies and local community officials) to establish effectiveness of monitoring efforts.
D. Provide volunteer groups with technical support to allow them to develop effective data management and analysis systems.	Data collected by volunteers will be more easily accessible and useful to local communities and agencies.	Track the degree to which this data is used, and survey volunteers to maintain and improve program effectiveness.
E. Ensure that quality control practices are consistently applied in coastal monitoring programs by providing annual training of groups and assistance in producing Quality Assurance Project Plans (QAPP).	Agencies, researchers, and local communities will have increased confidence in citizen-generated data.	Track number of training sessions held and QAPPs developed, implemented, and approved by the U.S. Environmental Protection Agency.
F. Produce a newsletter for all groups involved in citizen-based science, including habitat restoration and monitoring (see Objective EH-2). This will be produced in partnership with the Maine Coastal Program and other organizations.	A widely distributed periodic newsletter for citizens, researchers, regulators, and policy-makers interested in citizen-based environmental monitoring will be produced.	Track distribution of newsletter and conduct reader surveys to ensure that it is a useful tool for communicating activities of these groups.



Objective EH-3

Provide coastal communities with technical information and resources so that their decisions can be based upon accurate information.

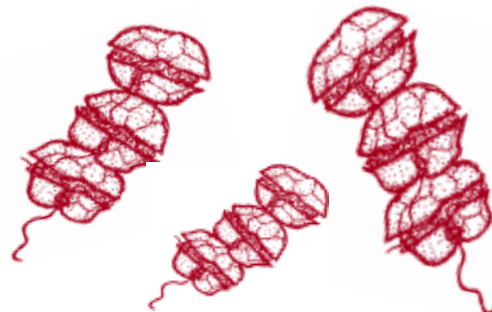
Rationale

The relationship between regulatory agencies, such as Maine's Department of Marine Resources and Department of Environmental Protection, and local communities is frequently unproductive and confrontational. Issues that generate controversy between communities and regulators include ecotourism, preservation of traditional working waterfronts, implementation of government-mandated zoning and planning programs, and proactive efforts to prevent ecosystem degradation. Communities need several types of support, including facilitating discussions about difficult planning and policy issues, mediating conflicting uses and perspectives, collecting environmental data, and locating resources available to address various ecosystem-related issues. The Marine Extension Team can impact the decision-making process by bringing the parties together, along with outside experts, to ensure that all available information is being considered, and the best possible solutions are developed. The Marine Extension Team can make information available by cultivating partnerships with researchers and other technical experts, developing information packets and fact sheets, and compiling lists of information sources available from the World Wide Web or libraries.





IMPLEMENTATION 2001-2003		
Objective EH-3: <i>Provide coastal communities with technical information and resources so that their decisions can be based upon accurate information.</i>		
Strategies	Anticipated Outcomes	Evaluation
A. Survey representative coastal communities to assess their needs for assistance to manage the marine resources over which they have jurisdiction, regulate development, and respond to state and federal regulations.	An inventory of key issues facing coastal communities in different regions of the coast will be developed.	Track survey results and synthesize a report for partnering agencies to use in developing training programs.
B. Develop extension programming to address the issues identified in the survey (see strategy A) where the Marine Extension Team can have the greatest impact. An example is providing assistance to establish new Nonpoint source pollution Education of Municipal Officials (NEMO) programs in Maine.	Coastal communities will have access to technical assistance and training materials that can be used to develop programs.	Track information packets and other literature distributed, as well as meetings organized and facilitated, and survey communities and regulatory agencies to assess the effectiveness of Marine Extension Team involvement.
C. Increase coastal communities awareness of the assistance available from the Marine Extension Team. Develop and provide fliers and other communications tools about available programs and services of the MET.	Coastal communities will be more aware of the opportunities for assistance.	Record distribution of publicity materials, number of requests for assistance, and resulting impacts on the decision-making process.
D. Work with faculty and advanced law students from the Marine Law Institute at the University of Southern Maine to provide coastal communities with legal information about issues such as aquaculture, public access, and fisheries.	Individuals and communities will have a better understanding of the legal aspects of marine regulations and policies.	Record requests for assistance and nature of the information provided. Survey recipients about impacts of information on decision-making.





Objective EH-4

Increase community support for, and participation in, restoration and preservation of coastal habitats.

Rationale

Many of Maine's coastal habitats have been adversely affected by human activities. Several organizations are working to restore these habitats and protect the important communities of animals and plants that they support. One example is the *Gulf of Maine Project* of the U.S. Fish & Wildlife Service. Although several kinds of habitat are threatened, sand dunes, salt marshes, and coastal wetlands are the most vulnerable because they are concentrated in the southern part of Maine where the population is growing most rapidly. Successful restoration efforts elsewhere, such as salt-marsh restoration by the return of tidal flow in New Hampshire and Massachusetts, could act as models for similar efforts in Maine. Our regional NOAA partners, the Wells National Estuarine Research Reserve and National Marine Fisheries Service, also recognize the need to focus resources on community-based habitat restoration efforts, creating the potential for effective partnerships and collaborative projects.

IMPLEMENTATION 2001-2003		
Objective EH-4: Increase community support for, and participation in, restoration and preservation of coastal habitats.		
Strategies	Anticipated Outcomes	Evaluation
A. Participate in ongoing efforts by U.S. F&WS and others involved in coastal habitat restoration to provide and obtain technical assistance, share resources, and coordinate efforts.	Organizations and individuals involved in habitat restoration will be aware of ongoing efforts and will contribute to the successful development and implementation of new projects.	Track participation in team meetings and impacts on ongoing and new restoration projects.
B. Educate coastal communities about the importance of wetlands and other critical habitats and provide information about restoration programs.	Coastal communities will become aware of the importance of critical habitats and become interested in habitat restoration.	Record number of participants and towns attending information sessions.
C. Assist coastal communities to select, conduct, and monitor restoration projects by providing information, technical assistance, and organizational support; and by recruiting volunteers.	The area and ecological value of important coastal habitats such as salt marshes and sand dunes, will be increased.	Track the number of projects initiated and participation by volunteers and municipalities. Measure project progress using well-defined benchmarks (e.g., area restored, re-establishment of critical species, etc.).




Aquaculture

Goals

The overall goals in Aquaculture are to:

 *Provide information and technical support to enhance the long-term sustainability of the aquaculture industry.*

 *Contribute to the ongoing debate about aquaculture in the state of Maine by providing the public with unbiased and accurate information.*

We will work towards these goals by addressing the following objectives:

Objective AQ-1

Provide the public with unbiased and accurate information about aquaculture.

Rationale

The introduction of a new industry, such as aquaculture, to Maine's nearshore waters creates the potential for conflicts with other users, including the fishing community, recreational users, and landowners. These conflicts will increase as the aquaculture industry seeks to expand, and recently there has been significant public opposition to some proposed aquaculture sites. There are many concerns about the placement of aquaculture facilities and the potential environmental, aesthetic, and ecological impacts. Sea Grant has a responsibility to educate the public about aquaculture so that discourse is

based upon facts rather than misinformation. In addition to providing general public information about aquaculture, the Marine Extension Team will sponsor open discussions that include proponents and opponents to aquaculture proposals and that engage researchers, municipal and state officials, and other interested parties. In this way, those involved will be armed with factual information when the time comes to participate in the decision-making process through public hearing and/or testimony.





IMPLEMENTATION 2001-2003		
Objective AQ-1: <i>Provide the public with unbiased and accurate information about aquaculture.</i>		
Strategies	Anticipated Outcomes	Evaluation
A. Hold open public informational sessions along the coast where aquaculture facilities are proposed. These will provide information about the nature of the industry, the laws, and the public hearing process for lease applications.	Due to increased understanding about aquaculture, decisions and policy will be based on factual information.	Track number of sessions and attendance, and survey attendees to determine if the sessions were informative and useful.
B. Develop communications tools, including fact sheets and radio spots, to help educate the public, regulators, and managers about aquaculture.		Record communications tools developed and track distribution (number and area).
C. Facilitate dialogue between aquaculturists and other marine stakeholders to mitigate conflicts.		Track involvement in conflicts and outcomes.

Objective AQ-2

Address problems in gear development, husbandry practices, disease, broodstock development, and other related issues.

Rationale

In Maine, aquaculture is a relatively new and developing industry that combines significant opportunities for growth and diversification with equally significant challenges. For example, the long-term health of the industry depends on developing practices that are both economically and ecologically sustainable. The University of Maine has recognized the potential of aquaculture and has significantly increased its long-standing commitment to research in this area. Consequently, there is an opportunity for the Marine Extension Team to play a critical role in providing information and technological assistance to new and existing industry members and in helping to identify data gaps and research needs. Extension agents are also able to work closely with industry to identify problems that can be addressed by the research community.





<p style="text-align: center;">IMPLEMENTATION 2001-2003 Objective AQ-2: Address problems in gear development, husbandry practices, disease, broodstock development, and other related issues.</p>		
Strategies	Anticipated Outcomes	Evaluation
A. Identify technical and scientific assets and promote their use by industry, researchers, regulators, and the public.	A directory of resources for use by field agents and targeted fact sheets for external distribution will be developed.	Track use of directory by extension staff and the distribution of information and fact sheets to stakeholders.
B. Respond to inquiries from growers and establish relationships between growers and researchers.	Productive partnerships between researchers and growers will increase.	Track inquiries and outcomes of industry/researcher partnerships.
C. Provide technical information to industry and regulators through seminars, workshops, and conferences.	Events, such as the Shellfish Aquaculture Seminars, the New England Farmed Fish Health Workshop, and the Hatchery Manager's Roundtable will be organized.	Track events and attendance, and conduct follow-up surveys, inquiries, and resulting projects.
D. Foster and participate in applied research, leading to improved culture equipment and husbandry practices.	Existing industries will improve and new ones will be developed.	Track research projects, including external funding, outcomes, changes in husbandry practices, and resulting improvements in industry success.
E. Help develop practices and regulations to improve production, fish health, and ecosystem health.	There will be greater industry compliance with regulations and enhanced business success.	Track participation of staff on inter-agency boards and committees and resulting regulations, industry compliance, and success.





Objective AQ-3

Assist with feasibility studies and pilot projects to investigate alternative species for propagation in Maine.

Rationale

The current aquaculture industry is primarily focused on salmon, trout, oysters, and mussels. There are several other species that might be grown in Maine. Ongoing research projects are being conducted on halibut, haddock, cod, urchins, scallops, and soft-shell clams. The Marine Extension Team will assist with these efforts and report progress to potential growers and other interested stakeholders, and they will also focus on the key question of economic feasibility. In addition to cultivating species to produce a marketable product, there is also considerable interest in using aquaculture techniques for wild stock enhancement, with recent efforts focusing on scallops. Interest in this type of aquaculture is likely to increase and will require significant support from researchers, extension agents, and regulators. The Marine Extension Team is well positioned to monitor progress, facilitate discussions between user groups, and keep the parties informed.

IMPLEMENTATION 2001-2003		
Objective AQ-3: Assist with feasibility studies and pilot projects to investigate alternative species for propagation in Maine.		
Strategies	Anticipated Outcomes	Evaluation
A. Conduct literature reviews and investigate culture operations elsewhere to compile information for Maine growers.	A library of resources on new and developing species will be compiled.	Track number of requests for information.
B. Facilitate collaborative research between industry and researchers on new and emerging species, such as scallops and halibut.	Reliable information on the culture of new species will be provided to industry.	Track research projects and resulting industry initiatives that start up.
C. Provide information on market analysis, economic feasibility and development of business plans.	Potential growers will be able to make informed decisions, develop business plans, and obtain financing.	Track number of requests for information and number of growers that develop market analyses, feasibility studies, or business plans.



Objective AQ-4

Assist with the development of standards and policy for the aquaculture industry.

Rational

The aquaculture industry in Maine is in a critical phase of developing and implementing sustainable practices that satisfy growers' needs to improve efficiency and that also satisfy regulatory mandates and public concerns. Over the past decade, regulations and statutes related to this industry have changed almost annually. This is likely to continue in the future, as the industry attempts to satisfy technical and societal demands. Maine Sea Grant is in a position to further these efforts by helping to create opportunities for collaborative approaches in developing standards and practices within the industry, to help ensure that policies, regulations, and statutes are substantiated by scientific and practical needs. There is considerable potential in aquaculture for stock enhancement to re-establish or supplement wild-capture fisheries. However, in many cases, discussions between the aquaculture industry, regulators, and the fishing industry will be required to resolve issues, such as who is allowed to harvest animals released into the wild.

IMPLEMENTATION 2001-2003		
Objective AQ-4: Assist with the development of standards and policy for the aquaculture industry.		
Strategies	Anticipated Outcomes	Evaluation
A. Enhance industry participation in the development of Best Management Practices (BMP) for finfish and shellfish culturists.	There will be greater industry compliance with BMPs.	Track industry adoption of BMPs and resulting improvements in business success.
B. Work with DMR to develop list of acceptable gear under the permit by rule regulation.	A list of allowable aquaculture gear will be available for industry.	Track use of inventory by DMR under permit by rule legislation.
C. Facilitate meetings of scientists, regulators, and industry members to identify research needs.	Publications summarizing the identified research priorities will be produced.	Track research proposals submitted that address priority areas.
D. Facilitate meetings between culturists, regulatory agencies, and the fishing industry to discuss using aquaculture for stock enhancement.	Stock enhancement programs for species, such as sea scallops, will be developed.	Record number of enhancement projects and resulting changes in landings and stock assessments.



Fisheries

Goals

The overall goals in Fisheries are to:



Provide information and technical support to enhance the long-term sustainability of the fishing industry.



Increase participation of industry members in fisheries management and research.

We will work towards these goals by addressing the following objectives:

Objective F-1

Assist the fishing industry to participate in the development and implementation of conservation and management strategies.

Rationale

There is growing interest in fishing industry participation in managing marine resources. Including fishermen in the design and implementation of conservation strategies allows managers to achieve better results by increasing fisheries' compliance with marine conservation policy. Marine Extension Team members have been active in supporting the soft-shell clam management process and in facilitating the Lobster Zone Council process. With their links to the marine science research community, industry, and managers, the Marine Extension Team can take a leadership role in the state's efforts to involve the fishing industry in conservation and management strategies. Partners in this effort will include Maine's Department of Marine Resources, the Gulf of Maine Aquarium, and the Northwest Atlantic Marine Alliance.





IMPLEMENTATION 2001-2003		
Objective F-1: Assist the fishing industry to participate in the development and implementation of conservation and management strategies.		
Strategies	Anticipated Outcomes	Evaluation
A. Work with researchers, industry members, and local and state managers to assist with stock enhancement, recruitment, and conservation projects.	Management of marine resources will be improved, leading to increased stocks and commercial harvests.	Record number of projects; and track outcomes, such as number of areas protected, organisms stocked, and industry members participating.
B. Assist communities and managers to identify and develop participatory management programs for marine resources, and assist ongoing efforts such as the Lobster Zone Council process.	Participatory or co-management strategies will be applied to more species and used by more communities.	Track number of communities that request Sea Grant assistance and adopt co-management principles.





Objective F-2

Enhance collaboration between the fishing industry and scientists in the design and implementation of fisheries research projects.

Rationale

The Marine Extension Team can stimulate new research projects designed to provide information for fisheries management by helping to establish partnerships between the fishing industry and scientists. There are growing opportunities for attracting significant funding to these types of collaborative research programs, from organizations such as the Northeast Consortium, New England Fisheries Management Council, and National Marine Fisheries Service. Sea Grant staff, with knowledge of the research capacity of the marine science institutions in Maine, can play a key role in identifying potential partnerships with industry members and vessels. As part of an effort to establish an agenda for marine research in Maine (industry priority-setting meetings held in spring 2000), the Marine Extension Team is aware of the most critical needs of the major commercial fisheries in Maine. Bringing this knowledge to bear in productive ways with the scientific community will allow for greater success in attracting funding.

IMPLEMENTATION 2001-2003		
Objective F-2: Enhance collaboration between the fishing industry and scientists in the design and implementation of fisheries research projects.		
Strategies	Anticipated Outcomes	Evaluation
A. Participate in funding initiatives to foster partnerships between industry and scientists and identify research projects that will provide useful information to marine resource managers.	The Maine fishing industry will benefit from federal initiatives to involve industry members and fishing vessels in research.	Track number of research projects involving Maine scientists and industry members, or that benefit Maine's fisheries.
B. Work with industry and scientists on cooperative projects, such as scallop stock enhancement and the experimental halibut fishery, to collect biological and fisheries data required by resource managers.	The fishing industry will be involved in research projects and provide data for management.	Record number of projects, state/federal research permits, industry members and researchers involved, and use of data by managers.
C. Network industry members with policy-makers and researchers, and provide technical support for research efforts involving the fishing industry.	Industry support for, and involvement in, research will increase.	Record number of meetings organized, research projects initiated, and industry members involved.



PROGRAM AREAS



Management

Goals

The overall goals for Program Management are to:



Improve and expand Sea Grant's research, extension, education, and communications programs.



Maintain a highly ranked Sea Grant program.

We will work towards these goals by addressing the following objectives:

Objective PM-1

Obtain increased funding for Maine Sea Grant.

Rationale

The length of Maine's coastline; complexity of the state's marine resources; importance of its fisheries, aquaculture, and other marine-based industries; and rapidly increasing coastal population create an enormous demand for Sea Grant expertise and assistance that far exceeds our capacity to provide it. Maine Sea Grant receives approximately \$1.4 million from federal (~\$940,000) and state (~\$480,000) sources (2001), and is one of the smallest programs in the Sea Grant network. Our top priorities are to increase funding for research to address key issues, and to significantly increase our extension capabilities.

Sea Grant research awards are small, relative to those from other agencies such as the National Science Foundation. Increased funding would allow us to continue to engage our best marine researchers and maintain the high impact of Sea Grant-funded projects. Our extension service is based on field agents who cover a geographical area and also have statewide responsibilities in their areas of expertise. There are many areas of the coast that are currently underserved by the marine extension team, and many important industries where we lack specific expertise, including marine biotechnology, seafood safety, recreational fishing and boating, economic development, coastal engineering, and tourism. Increased funding for Maine Sea Grant will be achieved by working within the Sea Grant Association, and with the National Sea Grant Office and Maine's congressional delegation to increase the overall federal funding for Sea Grant. At the same time, we will work to obtain funding for Sea Grant priorities in research and outreach programming from other federal sources, state agencies, and private foundations. An example of leveraging additional resources is the recent memorandum of understanding between Sea Grant (NOAA) and Cooperative Extension (USDA) at the University of Maine that has significantly increased our funding and capacity for marine extension.



IMPLEMENTATION 2001-2003		
Objective PM-1: <i>Obtain increased funding for Maine Sea Grant.</i>		
Strategies	Anticipated Outcomes	Evaluation
A. Work with the Sea Grant Association and the National Sea Grant Office to ensure that new resources are allocated based on a competitive process and an assessment of need.	New funding from the National Sea Grant Office will be awarded on the basis of competition between the programs.	Track allocation of new Sea Grant resources to the 30 programs.
B. Develop coalitions of Sea Grant staff, researchers, and stakeholders to respond to funding initiatives from the National Sea Grant Office.	Maine Sea Grant will be able to successfully respond to new funding opportunities from the National Sea Grant Office.	Track proposals submitted to, and funded by, the National Sea Grant Office.
C. Encourage researchers to submit proposals to fund part of a larger project, with awards contingent on the investigators securing the remainder of the funding through other grants.	By 2003, the portfolio of Sea Grant-supported research projects will generate at least \$100,000 per year from other agencies to support related activities (exclusive of the required 50% non-federal match).	Track funding awarded to investigators by Sea Grant and other agencies to support large projects.
D. Submit grant applications to other federal agencies (including National Strategic Initiative Competitions run by the National Sea Grant Office) and public/ private foundations to secure additional funding for research, extension, and education.	By 2003, Sea Grant will increase funding by a minimum of 10% (\$150,000) over the 2000 level. This increase will be in addition to any increases in core funding from the National Sea Grant Office or match from the University.	Track funding submitted to, and funded by, non-Sea Grant sources.

Objective PM-2
Maintain effective program management.

Rationale

Our objectives in the area of program management are to develop processes to select staff-initiated and development (seed fund) projects, track impacts and outcomes of projects, and conduct periodic self- and stakeholder-evaluation of progress. Although the Implementation Plan outlines specific strategies and actions, it does not provide operational details at the level of work plans, or week-to-week activities, of staff. Staff members will use the Strategic and Implementation plans to develop detailed work plans and submit them to the program management team in a standard Project Proposal Form. The form



will provide project details such as time commitments, completion dates, costs, outcomes and assessment tools, as well as its relationship to the Strategic and Implementation plans. It will also allow program management to apply consistent criteria when making decisions. Researchers who request program development funds for preliminary, or small-scale, projects will also use the Project Proposal Form to provide the program management team with information about the proposed project and anticipated outcomes.

The Project Proposal Form will also provide information required to make decisions about projects that are not covered by the Strategic and Implementation plans. Experience indicates that marine resource issues can change very rapidly, with previous priorities becoming less important and new issues arising almost overnight. Our process for selecting research projects, which involves regular stakeholder input and external review, has proven to be capable of timely adjustment to changing issues and priorities. However, this process is not suitable for selecting projects in the areas of communications, education, and extension, or for making decisions about funding development projects.

We will develop a program database to store and manage information from all aspects of the program. The database will become an important management tool allowing us, for example, to analyze resources allocated to particular theme areas, compile and collate information for the program annual report, and answer requests from the National Sea Grant Office and stakeholders. The database will allow us to conduct a regular self-evaluation of progress by allowing ready access to, and the ability to analyze, information submitted by staff and researchers.





A key role of the Policy Advisory Committee is to evaluate the performance of the program from the perspective of stakeholders. Regular stakeholder input will help insure that our programming is relevant and effective and, where necessary, allow us to make mid-course changes in projects. Ensuring that the PAC is fully aware of the program's projects and achievements will also allow members to be effective advocates for Sea Grant within the state. It is important to maintain productive relationships with other marine-related organizations in the state and in Washington, D.C. These include state and federal agencies, non-profit organizations, and industry groups. Our goal is to keep these organizations well-informed about Sea Grant's programs and services, and to keep abreast of their activities. This two-way information exchange can lead to collaborative projects, as well as joint funding opportunities, and help build a solid foundation of support for Maine Sea Grant.

IMPLEMENTATION 2001-2003		
Objective PM-2: <i>Maintain effective program management.</i>		
Strategies	Anticipated Outcomes	Evaluation
A. Use a Project Proposal Form to obtain information about staff projects and development fund requests.	Program Management will have access to information required to make decisions about projects using consistent criteria.	Policy Advisory Committee and Program Assessment Team will evaluate the program during periodic reviews (see Strategy PM-2-C).
B. Develop a comprehensive, searchable database to track all Sea Grant projects.	The improved ability to manage information will improve our efficiency and effectiveness.	A functional database will exist by the end of 2001.
C. The Policy Advisory Committee will conduct an annual review of the program, based on the annual report that highlights our accomplishments and ongoing projects.	A short report will be developed by a subcommittee of the Policy Advisory Committee and endorsed by the members.	Track annual Policy Advisory Committee assessments.
D. Maintain contact with marine-related organizations in the state and at the federal level, and identify several new organizations to contact each year.	Key constituents will be knowledgeable about Sea Grant and vice versa.	Produce an annual list of contacts and record any significant outcomes.



Research

Goals

The overall goals for research are to:



Focus research on the priorities of the state and nation, and maintain the highest scientific standards.



Transfer information to stakeholders in a timely and effective manner.



Train individuals qualified to work in marine science and policy.

We will work towards these goals by addressing the following objectives:

Objective R-1

Focus funded research on the priorities of Maine's stakeholders.

Rationale

Sea Grant supports both basic and applied research. Our objective is to focus our research program on the most important issues in the Gulf of Maine and to provide information of benefit to stakeholders. We will do this by soliciting projects that address issues in one of the three theme areas of ecosystem health, aquaculture, and fisheries; and by involving stakeholders in establishing annual research priorities and selecting pre-proposals.

The following are cited as examples of possible research topics and areas, and are not intended to exclude other project areas.

Ecosystem Health: Impacts and remediation of point and nonpoint source pollution, harmful algal blooms, non-indigenous species, coastal processes (e.g., sediment transport and erosion), habitat loss and restoration, coastal engineering and hazards, ecotourism and other non-traditional maritime industries, and a variety of economic and policy issues related to coastal development.



Aquaculture: Culture techniques for new and developing species; new product development; economic and market analysis; improved husbandry techniques for existing species; disease transmission, control, and prevention; environmental impacts of aquaculture; and the variety of policy issues related to leasing and conflicts with other users.

Fisheries: Information required to manage traditional and newly developing fisheries in a sustainable way, incorporate ecosystem-based management and essential fish habitat into management strategies, assess and minimize environmental impacts, develop non-traditional fisheries (e.g., recreational fishing), analyze the effectiveness of current and proposed management practices (e.g., co-management, ecosystem-based management, and marine protected areas), and resolve conflicts between the commercial and recreational fishing industries and other users.

Because it is also important not to close the door on scientific creativity and innovation, we will always be prepared to consider any research proposal that meets our overall mission.

IMPLEMENTATION 2001-2003		
Objective R-1: Focus funded research on the priorities of Maine's stakeholders.		
Strategies	Anticipated Outcomes	Evaluation
A. The theme areas will be identified as priorities in the annual request for proposals and project selection will maintain a balance among the three themes.	The portfolio of funded projects will focus on the three theme areas.	Track the number and dollar amounts of submitted and funded proposals in the three theme areas.
B. The Policy Advisory Committee will establish annual research priorities which will be listed in the annual request for proposals.	The portfolio of funded projects will reflect the priorities established by stakeholders.	Track the number and dollar amounts of submitted and funded proposals that address the annual stakeholder priority issues.
C. An in-state committee of stakeholders will review pre-proposals based on the relevance of the proposed research to Maine.		
D. Funding decisions will give priority to projects that address one of the priority issues identified by stakeholders.		

Objective R-2

Include an explicit outreach component in funded research projects.

Rationale

Because Sea Grant-funded research is intended to provide information that will benefit stakeholders, applicants will be required to include explicit outreach strategies in their proposals wherever appropriate. The outreach component of the research project will be developed and implemented in collaboration with Sea Grant extension and communications staff. The exact nature of the outreach will vary, depending upon the nature of the project and identity of stakeholder groups. Possible mechanisms include presentations, (e.g., to the Policy Advisory Committee), technical reports (e.g., to the Department of Marine Resources or other state agencies), public meetings or presentations (e.g., at the Maine Fisherman’s Forum), workshops or publications for key stakeholder groups, and web sites or print publications targeted at the general public. The existence of an explicit outreach strategy in research proposals will allow Sea Grant and the Policy Advisory Committee to assess progress towards meeting the stated goals. In some cases, papers in the peer-reviewed literature may be the only appropriate form of information dissemination. However, applicants will be expected to provide a compelling rationale as to how the results will be used that extends beyond increasing scientific knowledge and, where possible, obtain letters of support from stakeholders.



IMPLEMENTATION 2001-2003		
Objective R-2: <i>Include an explicit outreach component in funded research projects.</i>		
Strategies	Anticipated Outcomes	Evaluation
A. Applicants will develop outreach strategies in collaboration with Sea Grant communications and extension staff.	Results of funded research will be transferred to stakeholders in a timely and appropriate manner.	Track completion of stated outreach goals in research projects and survey stakeholders to assess impact.
B. Outreach strategies will be evaluated by mail and panel reviewers, and used as criteria in the full and pre-proposal selection process.		



Objective R-3

Train undergraduates, graduate students, and postdoctoral researchers.

Rationale

There is a continuing need for people with training in marine science, not only for research-oriented jobs, but also for policy and management positions. Sea Grant research is particularly valuable training for the latter type of job, due to the emphasis on research related to the most important issues facing the state. Many former Sea Grant-funded students have pursued careers in marine industries and in policy and management. We will continue to foster these opportunities by encouraging faculty to involve undergraduate and graduate students, as well as post-doctoral research fellows, in their funded projects. To ensure that our research projects continue to attract high quality students, Sea Grant will maintain competitive stipends for graduate students.



IMPLEMENTATION 2001-2003		
Objective R-3: Train undergraduates, graduate students, and postdoctoral researchers.		
Strategies	Anticipated Outcomes	Evaluation
<p>A. Applicants will be encouraged to include funding for undergraduate, graduate, or postdoctoral research in grant applications.</p>	<p>Maine Sea Grant will support 5-6 undergraduates, graduate students, and postdoctoral research fellows per year.</p>	<p>Follow subsequent careers of students and postdocs supported by Sea Grant.</p>
<p>B. Reviewers will evaluate the educational and training component of the proposed research and the applicant's prior track record in this area. Education and training opportunities will be used as criteria in project selection.</p>		



Objective R-4

Involve more scientists in Sea Grant research.

Rationale

Over the past decade, the majority of Sea Grant funding has been awarded to a relatively small number of research groups that represent a subset of the overall marine science expertise in the state of Maine. It is necessary to achieve a balance between focusing on key issues, running a merit-based competition, and involving new researchers in Sea Grant-funded research. Productive researchers who submit strong proposals should not be disadvantaged because they have previously received Sea Grant funding. Rather than interfering in the outcome of the peer-review process, our strategy is to encourage the submission of proposals from a larger group of researchers and research institutions. The majority of Maine's marine research scientists work at either the University of Maine or the Bigelow Laboratory for Ocean Sciences. However, there are also researchers at other institutions, including Bates, Bowdoin, and Colby Colleges; the College of the Atlantic; Maine Maritime Academy; the University of Southern Maine (e.g., the Marine Law Institute); the University of New England; and other campuses of the University of Maine System. Most of these are undergraduate teaching institutions where faculty have heavy teaching loads and, historically, have less experience and success in obtaining Sea Grant funding.

IMPLEMENTATION 2001-2003		
Objective R-4: <i>Involve more scientists in Sea Grant research.</i>		
Strategies	Anticipated Outcomes	Evaluation
A. Use the annual request for proposals to encourage proposals from people who have not previously received Sea Grant funding.	The number of proposals from, and grants awarded to, investigators who have not previously received Sea Grant funding will increase.	Track distribution of proposals and research awards.
B. Develop a brochure that will be widely distributed to researchers and institutions within Maine, outlining the funding opportunities and the program's research goals.		
C. Accept research at undergraduate institution (RUI) proposals that will be evaluated on the basis of time available for research and absence of graduate students. Expectations for scientific rigor, quality, and cost effectiveness will be the same as regular research proposals.		



Communications

Goals

The overall goals in Communications for the period 2001-2005 are to:



Demonstrate that Maine Sea Grant has made a difference to the lives of people in coastal communities and to the economy of the state.



Increase the public's general understanding of ocean and coastal issues.

We will work towards these goals by addressing the following objectives:

Objective C-1

Provide information about and promote Maine Sea Grant.

Rationale

The public should be able to obtain information about how the federal and state tax dollars that support Sea Grant are spent. Sea Grant's success ultimately depends upon demonstrating to the public and their elected representatives that they benefit from their investments. Our objective is to (a) provide succinct information about Maine Sea Grant, (b) highlight specific projects and successes, and (c) produce communications tools to support research and extension projects, several of which are outlined in the plan. In addition to a web site, the major tools will be a program brochure, project directory, annual report, and fact sheets about specific projects or successes in one of the three theme areas (e.g., aquaculture). These are intended for distribution at public meetings and conferences and will be sent to key decision-makers, such as members of the state Marine Resources Committee, the Washington delegation, and officials in local and state government. Communications tools for specific projects will be designed on a case-by-case basis, in consultation with researchers or members of the marine extension team, after carefully considering the objectives, size and identity of the target audience, and methods to determine impact.



IMPLEMENTATION 2001-2003 Objective C-1: Provide information about and promote Maine Sea Grant.		
Strategies	Anticipated Outcomes	Evaluation
A. Create and maintain a web site for Maine Sea Grant.	The web page will become a major communications tool for Maine Sea Grant.	Record impact of web page by tracking hits and requests for information, publications, etc., resulting from the Web.
B. Produce a program brochure with a 3-4 year shelf life.	A succinct summary of the program, suitable for general distribution, will be produced.	Track distribution of brochure.
C. Produce fact sheets highlighting accomplishments in specific projects or program areas.	Successes will be communicated to a wide range of audiences.	Track distribution of fact sheets (e.g., distribution at meetings, use by extension agents, mass mailings, etc.).
D. Produce an annual project directory.	A succinct summary of funded research projects and major extension and communications activities will be published.	Complete and distribute directory.
E. Produce an annual report summarizing major accomplishments in the context of the Strategic and Implementation plans.	Stakeholders will be aware of major accomplishments, and PAC and NSGO will be able to use the information to evaluate the program.	Complete and distribute report.





Objective C-2

Provide the public with information about marine science and the Gulf of Maine.

Rationale

As outlined in the National Sea Grant Network plan, there is a continual need to inform the general public about the marine environment, marine science, and important marine and coastal issues. The major focus of these efforts will be the three theme areas of ecosystem health, aquaculture and fisheries. Our strategy is to focus our efforts on a few communications tools that we believe offer the prospect for significant impact, given the limited resources that are available. For example, we plan to produce public service radio spots because these combine wide distribution with relatively low cost. Some of our communications efforts will focus on well-defined groups of stakeholders, such as the fishing industry, because these offer the prospect of greater individual impact, albeit to a smaller group of people, than efforts targeted at the general public. Finally, we will develop one or two major communications projects a year that result in high impact, long shelf-life publications.

IMPLEMENTATION 2001-2003		
Objective C-2: <i>Provide the public with information about marine science and the Gulf of Maine.</i>		
Strategies	Anticipated Outcomes	Evaluation
A. Produce tip sheets for local media about topical issues or newsworthy Sea Grant projects.	Local media will write stories about Sea Grant projects and will view Sea Grant staff as good sources of information about marine and coastal science and issues.	Track distribution of tip sheets (e.g., number of stories that are pitched and to what media) and how many are adopted.
B. Produce public service radio spots for Maine Public Radio about marine and coastal topics.	Public awareness and understanding of marine science will increase.	Track number of spots produced, topics covered, and number of broadcasts of each spot.
C. Develop monthly articles for one or two specialty newspapers such as <i>Commercial Fisheries News</i> .	Members of important stakeholder groups will receive periodic information.	Track circulation of newspapers and willingness of the publishers to continue to carry the articles.
D. Initiate and complete one or two major projects a year designed to produce high impact, long shelf-life publications for well-defined groups of stakeholders (e.g., a sea kayak coastal stewardship and safety manual).	The targeted groups awareness and understanding of an issue of importance to them will increase. In the example of the sea-kayak guidebook, this would be an increased awareness of safe boating, navigation, and coastal stewardship.	Record number of copies of each publication produced and distributed.



Education

Goals

The overall goals in Education are to:



Promote K-12 students' and teachers' interest in, and understanding of, the ocean and coastal habitats, and encourage incorporation of marine science in classroom curricula.



Provide professional development opportunities in marine science for teachers.



Provide opportunities for K-12 students to become involved in research.



Provide opportunities for graduate students to gain experience in marine policy.

We will work towards these goals by addressing the following objectives:

Objective E-1

Provide experiential training opportunities for K-12 teachers.

Rationale

Professional development is essential to the success of the *Maine Learning Results*. Furthermore, the National Science Education Standards emphasize hands-on experiences, inquiry, and the integration of teaching and science knowledge. We will develop one- to two-week summer workshops to provide hands-on, in-





depth instruction in a variety of marine topics, ranging from harmful algal blooms to coastal geology. The content of the workshops will be linked to Maine’s *Learning Results* initiative. In addition to gaining increased knowledge of an area of marine science, teachers will develop lesson plans to take back to their classrooms and earn continuing education credits. The workshops will be developed in consultation and collaboration with faculty from Maine’s institutions of higher education.

IMPLEMENTATION 2001-2003		
Objective E-1: <i>Provide experiential training opportunities for K-12 teachers.</i>		
Strategies	Anticipated Outcomes	Evaluation
A. Run a one- or two- week teacher workshop each year on some topic in marine science. Teachers will receive continuing education credit.	Maine’s K-12 teachers will have an increased understanding of the marine environment and have opportunities to incorporate marine topics and issues into their schools curricula.	Record number of teachers attending each workshop, review participant surveys, and track requests for curricular materials.
B. Curricula materials based on the workshops will be made available on the World Wide Web and in print form.		

Objective E-2

Provide opportunities for high school and undergraduate students to participate in marine research and extension.

Rationale

A recent study of students in their first jobs after college clearly showed that students with work-related internships were employed more quickly following graduation, were more likely to be employed in their fields of study, and were more satisfied with their current positions (*Journal of Career Planning and Employment*, Winter 2000). A program of research internships for students will contribute to the development of a well-trained marine sciences workforce, consistent with the needs of Maine and the nation. To provide high school and undergraduate students from Maine additional opportunities to participate in hands-on research experiences during the summer months, we will partner with existing programs, such as MERITS (Maine Research Internships for Teachers and Students) and Upward Bound to fund four to six summer internships, placing students either with Marine Extension staff or Sea Grant researchers. This program will encourage more students to pursue careers in marine science.



IMPLEMENTATION 2001-2003		
Objective E-2: <i>Provide opportunities for high school and undergraduate students to participate in marine research and extension.</i>		
Strategies	Anticipated Outcomes	Evaluation
A. Develop a program of research internships for high school students, including identifying prospective faculty hosts and obtaining funding.	K-12 and undergraduate students will have an increased knowledge and appreciation of research and extension.	Track number of applicants and their academic credentials, and survey participants.

Objective E-3

Provide graduate students with opportunities for experiential learning and service in marine policy.

Rationale

The National Sea Grant Dean John A. Knauss Marine Policy Fellowships provide an educational experience to graduate students who are interested in policy decisions affecting marine and Great Lakes issues. Our goal is to ensure that graduate students from Maine are aware of these opportunities and prepared to take advantage of them. In 1999, Maine Sea Grant established its own Legislative Fellowship Program that provides a graduate student an opportunity to work as a legislative aid to the Maine House/Senate Joint Standing Committee on Marine Resources. The goal of the fellowship is to ensure the committee has access to the best available scientific information and to act as a liaison between stakeholders, researchers, Sea Grant and the Marine Extension Team, Department of Marine Resources, and Marine Resources Committee.

IMPLEMENTATION 2001-2003		
Objective E-3: <i>Provide graduate students with opportunities for experiential learning and service in marine policy.</i>		
Strategies	Anticipated Outcomes	Evaluation
A. Promote national Knauss and Coastal Management Fellowships to graduate students in Maine.	Maine students will gain experience in marine policy at the national level.	Record number of applications by, and awards to, Maine graduate students. Track subsequent careers.
B. Continue Maine Sea Grant's Legislative Fellowship Program.	Graduate students will participate in public policy in the Maine legislature and assist the Committee on Marine Resources. The intern will help Sea Grant keep abreast of developing issues.	Survey participants and committee chairs. Track student's subsequent careers.



Summary

The Gulf of Maine is an important resource for the people of the northeastern United States and maritime Canada, and is especially critical for the citizens of the state of Maine. The majority of Maine's citizens live in the coastal zone, and many individuals, industries, and communities are directly dependent upon marine resources. Maine Sea Grant has an important role to play in promoting the understanding, wise development, and conservation of the resources of the Gulf of Maine and the Maine coast; and in sustaining our coastal communities and marine industries. The Strategic Plan provides an overall vision for the future and will guide our efforts over the next four years. The Plan is intended to provide a framework on which to build our programming, not to constrain our activities. Our success will be measured by our ability to have a positive impact on the lives and livelihoods of Maine's citizens. To do so, we have attempted to create a flexible plan that depends upon developing and maintaining close working relationships with stakeholders. Although finite resources and the need to maintain ongoing programs may limit our immediate flexibility, we welcome comments and input from anyone with an interest in the marine resources of the state of Maine.





How the Plan Was Written

Maine Sea Grant provides services and information to a range of constituents, and input from clients was an essential part of the planning process. The most important stakeholder input was provided by our 25-member Policy Advisory Committee of stakeholders, who were actively involved in reviewing and revising the plan through several drafts.

Our starting point was the most recent Maine/New Hampshire Sea Grant Program long-range plan, *Sustaining a Sea Beside the Sea* (1996-2000), and the National Sea Grant Plan (1995-2005). *Sustaining a Sea Beside the Sea* was developed based on stakeholder interviews and small group meetings. The present plan, *Marine Science for Maine People*, builds on this information by soliciting input through the Sea Grant staff from targeted individuals and groups. Many elements of *Sustaining a Sea Beside the Sea* are still valid and are included here.

The first draft of *Marine Science for Maine People* was written by Sea Grant staff. The nine-member Marine Extension Team works with stakeholders on a daily basis, and we relied upon this expertise, as well as that of other staff members, to select the initial issues and programs to include in our plan. We also incorporated information from several of our recent efforts to obtain stakeholder input. These included a 1998 survey of K-12 schoolteachers and a questionnaire used to solicit input to develop the job description for the southern Maine extension agent hired in 1999. Sea Grant and the Maine Department of Marine Resources ran a series of seven statewide stakeholder research priority-setting workshops in May 2000 to identify the key issues facing several of the state's most important fisheries. The resulting document was used as a basis for the Fisheries section of this Strategic Plan. Similar sessions were held in 1999-2000 with the aquaculture industry, and the outcome of those sessions has been integrated into the Aquaculture portion of this Strategic Plan.

Finally, we welcome any comments or suggestions about this plan. Our goal is to be responsive to new issues and opportunities, and we depend upon stakeholder input on an ongoing basis. ■

Photographers

Cover Photo: Marcy and Jerry Monkman, Ecophotography

p.2: University of Maine (UMaine) Dept. of Marketing/Monty Rand

p.9: UMaine Dept. of Marketing/Monty Rand

p.10 top: UMaine Dept. of Marketing/Monty Rand

p.11: Natalie Springuel

p.19 left: Chrissy Ford

p.19 right: Natalie Springuel

p.27: Chris Bartlett

p.30: Natalie Springuel

p.33: Paul Anderson

p.37: UMaine Dept. of Marketing/Monty Rand

p.38: UMaine Dept. of Marketing/Monty Rand

p.41: Natalie Springuel

p. 43: Sara Lindsay

p. 46: Natalie Springuel

All other photos:

 Maine Sea Grant Program

 UMaine School of Marine Sciences

Illustrations

p.4: Andrea Sulzer

All other illustrations: Maine Sea Grant Program

Editor

Susan White, Communications Coordinator/ Assistant Director, Maine Sea Grant Program

Designer

Natalie Springuel, Science Publications Specialist, Maine Sea Grant Program

Maine Sea Grant Program
5715 Coburn Hall
University of Maine
Orono, ME 04469-5715
Tel 207-581-1435
Fax 207-581-1426
www.seagrants.umaine.edu

MSG-RF-01-2
NA96RG0102
500



Cover photo by Ecophotography, Marcy and Jerry Monkman