

*Options for Managing Maine's
Near Shore Ecosystems*

A Series of Four Reports:

**Ecosystem Management
Alternative Dispute Resolution
Marine Protected Areas
Marine Zoning**

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Introduction

This series of reports provide a blueprint for effective stewardship of Maine's marine waters. The proposed recommendations build on ecosystem management to achieve the following goals: protection of the structure and function of our near shore ecosystems; increased opportunities for economic development; sustainable use of marine resources; and prevention of costly use conflicts. The tools envisioned to address these goals include a system of regional management plans, education, research, and monitoring, as well as regulation. The recommendations are intended as starting point; their adoption does not guarantee that Maine's marine waters will be as productive in the next century as the last. However, failure to initiate comprehensive management, failure to accept our responsibility for stewardship of the State's marine waters, can only jeopardize the future of our greatest natural resource.

Maine's marine waters are the State's most significant public resource, greater in acreage and economic importance than our public lands ashore. These marine resources have been used for food, energy, transportation, recreation and as a repository for a variety of wastes. These uses have evolved and diversified over the years. The ferries, schooners, and fishing boats of 100 years ago now share the bays with sailboats, cruise ships, tour boats, freighters, kayakers and jet skis. Despite the importance of these marine resources for a variety of purposes, the State lacks a coordinated approach for ensuring the future of these resources as we approach the next millennium. These reports offers a first step towards effective stewardship of our resources.

This series includes reports on Ecosystem Management, Marine Protected Area, Marine Zoning and Alternative Dispute Resolution. The report on ecosystem management explores a new approach to managing our near shore ecosystems that aims to improve management efforts by considering the interrelatedness of resources, the use of sound science and considers humans as part of the system. The other reports, Alternative Dispute Resolution, Marine Protected Area and Marine Zoning, explore tools for implementing an ecosystem management approach. These tools are not the only ones available or that should be used, but are ones that are relatively new to Maine. The reports are stand alone documents but together explore methods for improving management of one of Maine's greatest asset, the marine environment.

The Marine Policy Working Group provided insight and guidance to the development of these papers. Members of the Group included Steve Cole, Chris Cornell, Steve Dickson, Lee Doggett, Rob Elder, Penn Estabrook, Lewis Incze, David Keeley, Martha Kirkpatrick, Jim List, John Marsh, Karen Martin, Jack Merrill, Steve Oliveri, Fran Rudoff, John Sowles, Esperanza Stancioff, Brain Swan, Steve Timpano, and Jim Wilson. They gave graciously of their time and thoughts, which were much appreciated by the authors.

Ecosystem Management

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ECOSYSTEM MANAGEMENT

Maine's near shore resources – the coastal lands and neighboring waters that stretch from Kittery to Eastport – are one of the state's greatest assets and resources, greater in acreage and economic importance than our public lands ashore. These waters are part of one of the most productive ecosystems in the world and are home to a tremendous diversity of marine organisms. Tourists seek the coast to enjoy the view, water sports, fishing and an amble near the shore. Shipbuilding, fishing, recreational boating and other activities along the coast are a major source of employment for Maine residents. More than half of the state's population live and work along the coast. Despite the importance of these resources, Maine does not have a comprehensive policy framework for managing this inestimable resource.

Maine does regulate various aspects of this near-shore environment. Over 18 federal and state agencies and all of Maine's 144 coastal municipalities have some responsibility for managing coastal resources. Most of these regulations were designed to address specific problems and have resulted in complex, confusing, overlapping and at times gaping management regimes. For example, an activity in a coastal wetland requires a federal, state and local permit. Permitting has become the primary focus of Maine's management of coastal resource, management that should focus on economic development, ecological research, monitoring and evaluation. This hinders economic opportunities as well as overlooks the interdependence of parts of the ecosystem and the people who depend on it.

Ecosystem management can offer a framework for managing our marine resources as we approach the next millennium. Through an ecosystem management approach, Maine can more efficiently use its resources, identify priorities and build a system that includes long-term research, data collection, monitoring, regulation and evaluation.

I. Why Ecosystem Management?

Most of our current regulations were enacted in the 1970s in response to major identifiable strains on our natural resources. At the federal level, the Clean Air Act, the Clean Water Act, the National Environmental Protection Act, and the Endangered Species Act were enacted by Congress to respond to major threats to our natural resources. In Maine, the Site Location of Development Act was enacted to address the impacts of large developments, as well as laws protecting coastal wetlands, rivers, streams and lakes. Industry was the major contributor to our fouled air and water, exacerbated by unmanaged development. Implementing these laws solved major environmental problems.

However, in the 1990s, the environmental problems we face are more complex and difficult to address. As discharges and major development come under control, more complex and interrelated stresses threaten our natural resources. While major successes have been accomplished, the job is not complete and growth continues. Water pollution is an example: In

the 1970s, industrial discharges and untreated sewage were polluting most of our rivers. Today, the biggest problem is non-point source pollution, small levels of pollutants from a variety of sources – individual septic systems, and runoff from urban areas, farms and logging operations. These are serious threats and much harder to manage because they are dispersed.

Many of our laws and regulations are still effective in mitigating pollution. The problem is that we are operating under a regulatory framework that has been enacted over the last twenty years without the benefit of an overall policy or vision. There are gaps and redundancies in this framework, while at the same time it is complex and confusing. The symptoms of the lack of a comprehensive policy for the marine environment are numerous:

- * State agencies and municipalities do not consider the ecosystem as a whole when permitting activities. Decisions impacting a particular resource are made on a case-by-case basis usually concentrating only on one medium, with little consideration given to the overall system.
- * There are few links between the upland activities and marine resources. Protection of special areas under the Mandatory Shoreland Zoning Laws (38 MRSA §435), Site Location of Development Laws (38 MRSA §481) and the Municipal Subdivisions Laws (30-A MRSA §4401) do not consider marine resources such as shellfish beds or marine nursery areas.
- * Municipalities are not looking at regional issues through their comprehensive plans even though required to do so under the Growth Management Act (30-A MRSA §4311). There isn't a forum for neighboring municipalities or other stakeholders to comment on development proposals or to develop shared goals for a particular resource even though it may have significant economic value.
- * Habitat areas for commercial fish species or marine organisms are not protected. We regulate the timing and sometimes location of species harvest but do little to protect the habitats that sustain these species.
- * No mechanism exists for evaluating the overall effectiveness of our regulations. Evaluations are done sporadically and often focus on individual regulations. A systematic approach would examine the interrelationships among the various regulatory strategies.
- * Our regulatory system offers little flexibility for local concerns or issues. Southern Maine, with its extensive salt marshes, relatively straight shoreline and sandy beaches, is treated in the same way as down east Maine with its rocky shores and extreme tides. Setbacks and other management tools are applied uniformly though the natural systems are not uniform.

The piecemeal regulation of our marine resources in response to escalating environmental threats results in a complex system of environmental laws that are difficult to understand and to comply with, and are strictly regulatory in approach. The cost-effectiveness of dealing with

various problems is not addressed. The result is a management scheme that is least effective for the ecosystem in the long-term and does not reflect the state's priorities.

Ecosystem management is offered as an approach to holistically manage our marine resources, taking into consideration the ecosystem as a whole and the people who depend on it. Ecosystem management offers a focus positively on maintaining important resources at a meaningful level of supply and quality. In concept, it offers a more cost-effective and focused approach to managing natural resources and development.

II. What is Ecosystem Management?

Ecosystem management is an approach to management that considers the interrelatedness of resources, is based on sound science, and considers humans as part of the system. The goal is to improve management of our marine resources that human needs and the environment are integrated to the best of our ability over the long-term. Such an approach requires coordination at all levels of government, clear management objectives that are routinely evaluated and a scope of management that considers the natural system rather than political boundaries.

In a practical sense ecosystem management strives to maintain the integrity of the basic ecological unit. Piecemeal management – ignoring the interdependence of various parts of an ecosystem – can lead to environmental and biological decline. Ecosystem management recognizes that the environment is comprised of many interconnected systems and subsystems. Land, water, air and living things are all linked and cannot be managed in isolation from one another.

Ecosystem management differs from Maine's current approach for managing natural resources in that it is cross-disciplinary and requires managers to think through the implications of their decisions not just on adjacent resources but on resources beyond the scope of the permitted activity: downstream, between the land and water interface, and in other watersheds. Figure 1 outlines basic concepts and principles that characterize ecosystem management (Grumbine, 1994).

Figure 1. Properties of Ecosystem Management

1. Hierarchical Context or Connectedness

A focus on any one level of natural systems is not sufficient. When working on a problem at a particular level or scale, managers must seek the connections between all levels. This is often described as a "systems" perspective.

2. Ecological Boundaries or Management

Management requires working across administrative or political boundaries and large landscapes to incorporate the entire ecosystem. Estuaries and watersheds would be managed as complete systems, addressing both land-use and water resource issues.

3. Ecological Integrity

Management must protect, maintain, and restore native diversity, ecological patterns and the processes that maintain diversity.

4. Data Collection

Ecosystem management requires research and monitoring of baseline conditions of natural systems as well as better management and use of existing data.

5. Monitoring or Evaluation

Managers must track the results of their actions so their success or failure may be evaluated quantitatively. There needs to be an on-going feedback loop of useful information.

6. Adaptive Management

The development of scientific knowledge must be seen as ongoing and management as a learning process where incorporating the results of previous actions allows managers to remain flexible and adapt to uncertainty.

7. Interagency Cooperation

Protecting and managing systems requires cooperation between federal, state and local management and regulatory agencies as well as private parties. Managers must learn to work together and integrate conflicting legal mandates and management goals.

8. Organizational Change

Implementing ecosystem management requires changes in the structure of agencies and the way they operate to broaden the scope of management.

9. Humans Embedded in Nature

People cannot be separated from nature. Humans are fundamental influences on ecological patterns and processes and are in turn affected by them.

10. Values

Regardless of the role of scientific knowledge, human values play a dominant role in ecosystem management goals.

The strengths of ecosystem management are that its principles are grounded in science and an understanding of natural systems. It offers a more natural approach to resource management and strives to maintain ecological integrity and biodiversity. Because it is based on how ecosystems work, ecosystem management offers opportunities for flexibility in regional management schemes. For example, development setbacks may not be important for resource protection in some areas as they are for others. Finally, ecosystem management acknowledges that people are part of the ecosystem and realistically integrates their needs and impacts on the system as a whole.

The weaknesses of ecosystem management are that while this concept has been around for some time and understood by scientists and land managers, it is not clear how to implement this approach on a statewide level. Managers and regulators are breaking new ground in trying to administer and implement these concepts. Ecosystem management requires institutional change and training to implement because it is cross-disciplinary in approach. Working across political jurisdictions also can be difficult and frustrating. Finally, ecosystem management is grounded in science, but we will never know enough to manage by scientific facts alone. Thus, we need to make reasoned choices about our environment without all the information that is needed. These choices are not devoid of value judgments.

III. The Need for Ecosystem Management

Maine's marine environment needs to be managed from an ecosystem perspective. This section outlines four reasons why marine resource management needs to be rethought.

1. Regulatory Systems Need to Be Reworked

There are two examples of regulatory systems in Maine that need a closer look: water classification and the lobster fishery.

Marine waters in Maine are broken into three categories according to their quality (SA, SB, SC). Allowable standards for discharges are based on these categories with certain discharges and activities prohibited in the cleaner categories. Class SA waters are considered outstanding natural resources to be preserved because of their ecological, social, scenic, economic or recreational importance. Direct discharges to SA waters are prohibited. Acadia National Park and several coastal state parks have adjacent waters classified SA. Parts of Cobscook Bay are classified SA for ecological reasons, as well as the coast from Cutler to Lubec and areas around the Isle of Shoals.

While no discharges are allowed in SA waters, other activities that may affect their ecological integrity are unregulated. For example, draggers can comb the bottom at will and destroy the environmentally sensitive habitat this classification is designed to preserve. A marina can be sited within sensitive SA waters, with the potential for petroleum spills from fueling and sewage from boats. On the other hand, net pen aquaculture, so dependent on clean water and high flushing rates, cannot be sited in SA areas because fish feed and medicines are considered a discharge.

This regulatory system developed in the 1970s is perpetuated as our basis for managing water quality. Yet it is a single-purpose approach that regulates one activity without a comprehensive approach for managing other threats to, or opportunities for, these same resources.

The other example of regulatory systems that need a fresh approach is the lobster fishery. Maine is renowned for its lobster fishery and it brings in \$75 million per year. Harvesters are regulated over how and when they catch lobsters but the population levels and essential habitats are not protected. Indeed, surprisingly little is known about the habitat requirements for sustaining this important species.

2. Municipal Concerns for Shared Resources

Boothbay recently approved an application for an expanded marina along the Damariscotta River. During the application stage, towns along the River expressed concern over the impact the increased numbers of boats would have on the pristine waters of the Damariscotta River that host a thriving aquaculture industry. Concerns were also raised about increased boat traffic and other potential use conflicts. While this proposal has the potential to significantly affect a resource shared by several towns, there is no forum for these concerns to be considered or a common vision of how this resource should best be used. This example highlights how limited our approach is for resources that have not only ecological but economic value cross town boundaries.

3. Cumulative Impacts

The Department of Environmental Protection regulates large scale land-use developments and development within particularly sensitive habitats such as coastal wetlands and sand dunes. Their review is restricted to site-specific standards that do not allow a broader view or consideration of threshold impacts. For example, the first structure within a sensitive environment may not have an unreasonable impact on the ecological integrity of that area, however the third, fourth or eighth structure will. There is no way to address this under the current regulatory scheme.

Many land-uses that could potentially affect the marine environment do not trigger an environmental review. Small land use development and non-point sources, whose cumulative effects can drastically alter the marine environment, are examples of these impacts. Effects on marine resources are not often included in land use reviews because decision-makers don't have the tools, expertise or regulatory authority to consider those effects.

4. Poor Linkages Between Science and Policy

Maine does not have the resources to address major management issues in our fisheries, or the tracking systems to evaluate the policies that are in effect. Budgetary problems have forced state agencies, including the Maine Department of Marine Resources, to streamline research staff. Much of current marine research is funded through surcharges on specific harvesting licenses, limiting the breadth and scope of work that can be done. Little money is

allocated to monitoring marine conditions; an important element of understanding threats to the system. And little is available to fund basic research by community of marine scientists at public and private academic institutions in the State. As a result, the foundation of basic knowledge isn't growing as it should, and communication between scientists and managers is weak.

For example, Maine has hosted a burgeoning sea urchin roe fishery in the past several years. Landings have skyrocketed to 42 million pounds (with a value of \$27 million) in just 5 years. While the fishing industry has enjoyed the opportunities this new fishery represents, it's not clear what effect this sudden, intense harvesting pressure has on the marine ecosystem as a whole and what harvesting levels are sustainable. Harvesting is regulated by size of urchin and by season. Meanwhile, research funds to address these questions are limited.

In summary, these examples demonstrate how we are not integrating our regulation or management of natural resources in a coherent system. We are using single-purpose regulatory schemes to manage multi-faceted resources; we don't coordinate local decisions even though they have the potential to affect economically valuable resources; we don't have an understanding of the threshold of change our ecosystems can tolerate; and we don't invest in the science or monitoring needed to understand the ramifications of our current actions on the ecosystem. In short, our coastal ecosystems deserve a better management system.

V. Examples of Ecosystem Management

The concept of ecosystem management has captured the attention of federal agencies, landholding organizations and state governments and has been applied in many different contexts. This section outlines several examples of how it has been used in other regions. While these examples provide a diverse range of approaches, their underlying theme is a more holistic view of natural resource management. Maine has used the principles of ecosystem management in a recent project and this example is outlined last.

1. Federal Level: EPA Place-Based Management

The US Environmental Protection Agency (EPA) is trying to move beyond their regulatory mode and focus on place-based environmental management tied to key problems that occur in particular ecosystems. It relies on stakeholders in those places to define the problems, set the priorities, and help with the solutions. EPA will be developing a process in the coming year to focus on the environmental problems of specific places rather than following their traditional single-media approach. For any given place EPA will evaluate long-term ecological, economic and social needs and reorient their work to meet those needs. EPA also will coordinate in-house programs and collaborate with external partners to define roles and responsibilities at each place. The "Edgewater Consensus" as this initiative is known, is in its formative stage. Each branch of the agency has been directed to develop work plans for implementing this approach.

The US Forest Service also is integrating ecosystem management into their management regime by looking beyond their ownership boundaries to determine the significance of their

lands in a larger context for meeting societal and environmental needs. The Department of Interior has created the National Biological Survey, consolidating research in one agency to stimulate cross-disciplinary research that is not tied to the mandate of one agency.

2. State Level: Florida

The State of Florida is developing a proposal to move the State toward ecosystem management. The Florida Environmental Reorganization Act requires the State to "Protect the functions of entire ecological systems through enhanced coordination of public land acquisition, regulatory, and planning programs." Their concept is based on an environmental strategy that encourages innovation, pollution prevention, incentive-based regulatory alternatives, and more coherent cross-media efforts to produce collaborative solutions to environmental problems.

The Department of Environmental Protection (DEP) has defined ecosystem management¹, articulated goals², developed a work plan to move toward those goals, and worked with committees to develop recommendations on what ecosystem management will entail. These committees, covering 12 distinct areas from pollution prevention to the role of private landowners, have made their recommendations. DEP is integrating their work to develop an implementation strategy. A report is expected in late Spring 1995.

3. Landholding Organizations: Virginia Coast Reserve

The Virginia Coast Reserve is a string of barrier islands more than 100 miles in length that fronts Virginia's shoreline. These islands, owned by The Nature Conservancy (TNC) and State and Federal Government, are the last undeveloped, fully-functioning barrier island ecosystem on the unglaciated coast, considered the most significant natural ecosystem in the Eastern United States.

Long-term protection of this system requires more than simple ownership and they are now managed as part of a larger system that is bound not only by biological ties but economic and cultural ones as well. These islands were designated a biosphere reserve in 1979, that consists of a core area that receives maximum protection (the actual islands), a buffer zone that is managed to protect the core (adjacent mainland watersheds), and a transition zone or "zone of cooperation" that includes farms, village clusters, businesses, recreational facilities and compatible industry.

¹ Florida defines ecosystem management as an integrated, flexible approach to management of Florida's biological and physical environments – conducted through the use of tools such as planning, land acquisition, environmental education, regulation, and pollution prevention – designed to maintain, protect and improve the state's natural, managed, and human communities (Beginning Ecosystem Management: an action plan for development of an ecosystem management implementation strategy, Florida Department of Environmental Protection, 4/25/94).

² Florida's three goals are: better protection and management of Florida's ecosystems, agency structure and culture based on a systems approach to environmental protection and management, and an ethic within the citizenry of shared responsibility and participation in protection of the environment (IBID).

High density housing developments are the greatest threat to the Virginia Coast Reserve as the cumulative effects of these developments have the potential to degrade the bay and marsh ecosystem. TNC has been working with private landowners to enact conservation easements and with local government to design zoning ordinances to balance conservation and development. They also have bought strategic sites, placed easements on them and resold them on the open market, ensuring that the land use is compatible with the reserve system. (Badger, 1990)

4. Local Level: Damariscotta River Estuary Project

In 1993, the Maine Coastal Program initiated the Damariscotta River Estuary Project (DREP). The goal of the project is to develop an estuarine management plan that will be supported and implemented by the seven towns in the watershed. A steering committee of 17 local citizens, including one member from each local land trust, the Damariscotta River Association, and the Lincoln County Planning Office, has guided the activities of the project from its inception. Resource information has been provided on GIS computer-generated maps to display interrelationships within the watershed and help focus the group.

The project is looking at the estuary as an ecosystem to understand the link between upland and marine resources. DREP has characterized the upland and marine resources on a systems basis, focusing on the relationships among resources. The project has also conducted an economic valuation of the local economy, which is largely dependent of shellfish harvesting and shellfish aquaculture.

The staff is now developing a estuarine management strategy for the area. Each town has a comprehensive plan but management of the estuary on a system basis requires coordination between the plans. The success of the strategy depends on interlocal implementation. The staff is working closely with local planning boards and citizens to design a system that will work for these rural communities. The project expects to complete the strategy by the summer of 1995.

As these four diverse examples show, there is no one approach for using ecosystem management; each agency needs to define their approach to meet their objectives. The underlying characteristics as outlined in figure 1 are what make it ecosystem management.

VI. Moving Forward: The First Steps

Changing our regulatory framework for managing near shore resources is a large undertaking. There are some basic steps Maine can take to embark on this endeavor.

1. Land and Water Resources Council: Leading the Way

The Land and Water Resources Council (LWRC) should review the concept of ecosystem management as an opportunity to better manage and regulate Maine's resources. This paper focuses on coastal ecosystems but the approach makes sense for inland Maine as well. The LWRC, comprised of Commissioners whose agencies manage natural resources, is in the unique position to move ecosystem management forward. Ecosystem management can offer

cross-agency efficiency in research and management. It can serve as a framework for Maine to articulate land acquisition, management, and economic development goals.

The Maine Environmental Priorities Project (MEPP) will rank environmental risks within the year, balancing human health and environmental risks with quality of life concerns. The LWRC should use this information to focus ecosystem management on what natural resources are most at risk and of most concern to Maine's people.

- A. The LWRC should look in-depth at the opportunities for ecosystem management. A model that incorporates extensive public involvement (similar to the State of Florida) should be used.
- B. In conjunction with A above, should develop a mechanism to coordinate research and monitoring in a way that crosses agency lines, and offers some efficiencies. The Department of Interior's recent formation of the National Biological Survey, which consolidated the Department's research into one agency, is one model that could be explored.

2. Create Interagency Teams to Integrate Permitting

Currently, applicants must receive 3 to 5 permits for activities occurring in the near shore environment. While most applicants understand the need for multiple reviews, the process of compiling multiple applications is lengthy, complicated and expensive. An integrated permit would streamline the permitting process and enhance coordination among different levels of government.

- A. The LWRC should evaluate interagency permitting teams to integrate and expedite interagency review of permits, building on DEP's watershed division. Team permitting would allow the reviewers to work from the same application, share information about resources within their areas of expertise, and identify the most effective way for an activity to proceed. Teams would integrate different media and resources. Team members would be empowered to make permitting decisions on behalf of their agencies, ensuring that high caliber agency personnel would be assigned to these teams. These teams also could incorporate local input to expedite the process at the local level.
- B. In addition, the LWRC should evaluate mechanisms to work with federal and state permitting systems to integrate both application and review procedures and standards.

3. Consolidate and Coordinate Local Technical Assistance

A network of federal, state and regional entities provide technical information to local boards and authorities. From a local perspective, the array of assistance providers can be complex and confusing. Consolidation and coordination of these functions would better serve the constituent.

- A. The State Planning Office should develop a framework to coordinate these functions through a handbook or hotline.

4. Integrate Data Management Systems

The challenge of this decade is to bring information together across projects, environmental media (land, air, water), programs and political boundaries. Appropriate data, gathered either through routine monitoring or focused research, analyzed and distilled into user-friendly formats, is critical for making good management decisions.

Maine needs to further their work on integrating data management systems to provide this framework for decision-making. Data also needs to be available on a regional basis, including permitting sites. Interactive systems that can provide and receive information from local agencies should be developed to ensure that decisions reflect current information.

- A. A regional pilot project as described below provides an opportunity tool to develop a template for the type of information that is needed and can be used when trying to manage our resources on an ecosystem basis. Any work on a pilot project for ecosystem management needs to incorporate a data management piece. This work can build on GIS work done through the Casco Bay Estuary Project and the Damariscotta River Estuary Project.

5. Pilot Project

Implementing ecosystem management requires both state and local actions. The state needs to set overall guidelines and policies, provide examples and assistance, and develop an overall structure for implementation. Towns need to come together to manage shared resources and work toward common goals, opportunities, and management regimes. The most effective tool for accomplishing this is through a regional plan focused on ecosystem boundaries. This plan, referred to here as a Coastal Ecosystem Strategy, would provide the forum for gathering information and making consistent policy decisions across town boundaries. Below is the outline of a planning tool that can lay the framework to accomplish this work. Additional roles for state government and municipalities are included in Appendix A.

The forum for developing ecosystem management of our marine resources would be a Coastal Ecosystem Strategy, to integrate municipal and state activities and decisions. A Coastal Ecosystem Strategy would be based on a scientific understanding of the function and importance of the marine ecosystem and recommend measures to protect these functions. Since each plan would be based on the regional ecology, the management system would be tailored to the needs and uniqueness of the region and would build on the information and policy decisions reflected in the local comprehensive plans. Briefly defined, a Coastal Ecosystem Strategy would:

- * Define goals to balance protection, economic opportunities, recreational activity and infrastructure needs;
- * Characterize the ecosystem's ability to support these goals in terms of commercial resources, recreational facilities, and ecological resources;

- * Define management tools to achieve desired goals such as marine growth areas, marine conservation areas, marine-use zones, upland setbacks, and permitting and review coordination;
- * Identify marine conservation areas and management recommendations that meet state-generated guidelines;
- * Define region-specific public access, research and education needs;
- * Define a monitoring program to test management measures; and
- * Develop a periodic review process to refine the goals of the plan and the effectiveness of the various tools used.

Coastal Ecosystem Strategies offer a strong foundation for improving management of our near-shore marine resources. It provides a tool to define areas where growth should or should not go. It can be used to balance economic opportunities for our marine resources while ensuring their viability.

- A. Building on the experience of the Casco Bay Estuary Project, the Damariscotta River Estuary Project, and EPA's place-based strategies, the LWRC should develop a pilot ecosystem management project in a coastal watershed, using the model of a coastal ecosystem strategy defined above.

VIII. Summary

Ecosystem management offers a way to build a new method to manage our near shore resources. Specifically, ecosystem management would:

- * Be based on sound science;
- * Adapts to new information;
- * Balance protection and development;
- * Measure effectiveness and readjust accordingly;
- * Coordinate within and across government to design an integrated program for a particular ecosystem;
- * Build on local planning efforts and be responsive to the needs of a given particular area; and
- * Actively involve all individuals and groups with an interest in the area.

Maine's coastal economy is one of the most important and productive sectors of state's economy. Aquaculture, which depends on clean water, is one of Maine's primary growth industries. Tourism is the second largest sector of Maine's economy. As budgets become tighter, Maine will be forced to make natural resource management priorities. Ecosystem management offers an approach for effectively managing the resources on which these activities depend.

Developing ecosystem management strategies requires a commitment of time and resources. However, this should translate into more efficient use of our state monies, faster permitting and more effective regulation of the resources on which we depend.

Appendix A: State and Local Roles in Coastal Ecosystem Strategies

A. State Role

The State of Maine should take the lead in defining what a system of regional plans, or Coastal Ecosystem Strategies, would look like and offering support through technical assistance and information. Specifically, the State would:

- * Identify natural ecosystems and their boundaries. This would entail dividing the coast into discrete ecosystem units;
- * Develop guidelines for plans that provide a template for how to develop and integrate the needed information. This also would include an outline and model plans;
- * Suggest consistent land use and water quality standards for municipalities to adopt to manage their resources, such as setbacks and erosion and sedimentation control;
- * Identify important marine resources to protect and manage and suggest tools to manage these resources. Actual management would occur at the state and local level;
- * Provide technical assistance to groups of municipalities developing Marine Ecosystem Plans;
- * Define criteria for and suggest candidate sites for marine conservation areas; and
- * Provide financial incentives for completing plans and local permitting options for municipalities that undertake this approach.

B. Municipal Role

Municipalities working together play the central role in developing Coastal Ecosystem Strategies. As a group, municipalities' role in developing these plans would be to:

- * Identify issues of shared concern;
- * Define local goals and priorities for shared management based on ecological and economic characterizations of the ecosystem;
- * Develop plans and a framework for regional management that will meet state and local goals;
- * Integrate local knowledge and concerns into these plans;
- * Adopt consistent land use standards and management requirements; and
- * Implement the plans through regulating land and water uses.

Most coastal and marine ecosystems extend beyond municipal boundaries and any attempt to consistently manage these ecosystems must rely on regional cooperation. Municipalities acting alone are unable to protect coastal ecosystems from impacts upstream or outside their boundaries. Besides ecological concerns, towns working together can enhance their own economic goals and public access opportunities. This model offers a mechanism for doing this.

Alternative Dispute Resolutions

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ALTERNATIVE DISPUTE RESOLUTION

Disputes over our coastal resources are a legacy of their increasingly scarce nature and their economic value. In the past, zoning of specific uses or strict regulation have been used to resolve problems between and among groups using these resources. However, another range of tools holds promise for resolving problems in the marine environment. This paper gives an overview of Alternative Dispute Resolution (ADR) techniques, how they are currently used within the marine policy context, identifies areas in which ADR techniques may be most useful and recommends ways to increase their use.

I. What is Alternative Dispute Resolution

The goal of ADR is to identify and resolve conflicts early, saving time and money by minimizing disruptions. This paper focuses on public policy conflicts in the marine environment; additional tools available in private disputes, such as contract clauses or binding arbitration, are not addressed here.

Alternative Dispute Resolution (ADR) can be broadly defined as any technique used to avoid, manage or resolve conflict short of formal adjudication. ADR can be used at many different levels and in many contexts. For this discussion, ADR techniques are broken into informal and formal techniques.

Informal techniques are used to avoid disputes. They include gathering information on different viewpoints or positions to avoid conflict or amend a position. Commonly used informal techniques include holding public information meetings, meeting with permit applicants or groups opposed to a particular application or proposed change. There are no outside parties to assist in the process. Informal techniques are used on a daily basis and often are not recognized as ADR.

Formal ADR techniques are used after a dispute occurs. They generally involve a neutral third party or specific process that is employed to resolve the dispute. Formal techniques are used less frequently in Maine's marine environment. Figure 1, adapted from a memo developed by the Maine Interim Advisory Committee on Alternative Dispute Resolution in the Public Sector, outlines some of the more commonly used formal techniques.

Figure 1.
Alternative Dispute Resolution Techniques

Facilitation

A process in which a neutral person guides meeting discussions to assist a group in attaining their goals to the mutual satisfaction of all participants.

Ombudsperson

A person who investigates and may assist in the resolution of conflicts between members of the public and government agencies.

Negotiation

A process in which the parties explore possible settlement of disputes. The parties manage the process and design the solutions to the disputes.

Partnering

A facilitated process in which parties who are undertaking a project together identify mutual goals, develop effective lines of communication to prevent disputes, and agree on expedited procedures to resolve disputes that arise during the project. Construction projects frequently use partnering.

Mediation

An informal process in which a neutral person assists parties in reaching a mutually acceptable agreement through facilitated negotiation. This may entail meeting with the parties separately to identify issues and common goals. The mediator has no authority to impose a resolution.

Arbitration

A process in which a neutral decision-maker, often with specialized expertise, hears evidence and arguments at an informal hearing and renders a decision. Arbitration may be binding or non-binding, based on agreement of the parties and/or legal constraints.

Negotiated rule-making

There are two types of negotiated rule-making:

- Formal – Formal negotiated rule-making involves a convened process that brings all interested parties to the table to reach consensus in the development of a proposed rule.

- Informal – Informal negotiated rule-making involves an agency engaging in general discussion about significant issues with the major parties prior to proposing a rule.

II. Current Maine Initiatives on Alternative Dispute Resolution

The State of Maine is beginning to use ADR in several different contexts. This section outlines two examples.

A. Interim Advisory Committee on Alternative Dispute Resolution in the Public Sector

In 1992, the Commission to Study the Future of Maine's Courts found that the court system in Maine was overburdened by disputes that would be better resolved through mediation or dispute resolution. Among their findings, they recommended that an interim advisory group be developed to provide short-term assistance to state, municipal and other governmental entities in developing plans and policies for dispute resolution.

The Interim Advisory Committee on Alternative Dispute Resolution in the Public Sector was established and charged with studying the use of negotiated rule-making, to provide guidance and expertise in developing ADR techniques for state, municipal and other governmental entities, to assess the costs and benefits of ADR, develop funding options for training agency personnel and to develop a proposal for a state center for dispute resolution to continue these efforts.

Among the Committee's findings was that a survey of state agencies indicated that although interest in ADR is high and there have been agency successes, knowledge about and use of ADR are low (Ann Gosline, pers. comm. 1/95). Their recommendations include the following:

- A. Integrating effective dispute resolution processes into state and municipal government. This translates into creating a network of ADR specialists, a state ADR coordinator within the Governor's office, and encouraging municipalities to designate ADR liaisons to help them integrate ADR into municipal work.
- B. Expanding existing efforts to educate both government employees and the public about ADR and collaborative problem-solving. This entails expanding and coordinating current educational efforts by a variety of organizations.
- C. Creating University resources to support ADR in the public sector.
- D. Passing a Maine Negotiated Rule-making Act to give guidance to agencies when to use negotiated rule-making and how to design the effort.

B. Transportation Policy Advisory Committee

In 1991, Maine voters shifted the direction of transportation policy in Maine by passing a referendum to stop the widening of the Maine Turnpike and create a "Sensible Transportation Policy" for the State. The Maine Department of Transportation (DOT) initiated a consensus-building process to create this policy with representatives from over 60 organizations. For six months, the group hammered out their differences over the proposed regulations. In the end, the

members actually found they had more common views and goals than expected and after much work unanimously agreed to proposed rules. A team of facilitators helped the group focus their efforts and accomplish this work.

The new rules institutionalize consensus building through the creation of Regional Transportation Advisory Committees (RTACS) composed of public members. These eight committees are charged with developing twenty year regional transportation plans. RTACs represent diverse interests and advise the DOT on regional transportation and land use goals, needs and deficiencies.

III. Using ADR in the Marine Environment

ADR is used frequently on an informal basis in the marine environment. Federal and state agencies extensively employ informal ADR techniques to help them identify issues and avoid conflict, however more formal techniques are used less frequently. This section outlines several examples of how ADR techniques are currently utilized at the federal, state and municipal level and identifies opportunities to enhance their use.

A. Federal Level

ADR is being used by federal agencies for dam relicensing and dredging proceedings that involve state agencies.

1. FERC Dam Relicensing

Relicensing of hydropower dams raises issues for anglers, power generators, whitewater rafters, landowners and many others. Both the Federal Energy Regulatory Commission (FERC) and hydropower applicants are using ADR in the licensing process.

Central Maine Power Company (CMP) used informal ADR to prevent protracted disputes within their FERC relicensing efforts on the Saco River. CMP pulled a large group of interests together to amend the comprehensive fish passage plan for the entire Saco River. They set up a process to share information between parties and negotiated terms based on that information. The result was a new management plan for Saco River fisheries.

This plan allows a holistic view of the river system rather than the piecemeal approach afforded by the FERC relicensing system. CMP has agreed to install fish passage at three lower dams on the Saco River over the next four years in exchange for the stipulation that upstream fish passage needs to be built only if it is warranted. State and federal fisheries managers will decide if fish passage is needed. This agreement gives CMP more certainty over some of the requirements and timing of fish passage projects on the river and may reduce costs overall. These amendments to DMR's Saco River Strategic Plan for Fisheries Management were adopted in May, 1994, by the Marine Advisory Council and will influence what the FERC requires of CMP in their dam relicensing process.

The Edwards Dam on the Kennebec River in Augusta is an example of where formal ADR techniques were used but ultimately failed. Governor McKernan declared himself in favor of removing the dam, while the owners filed an application to expand and relicense the facility. FERC delegated the Edwards Dam license application proceedings to an Administrative Law Judge to mediate the differences before the formal application process in the hopes of shortening and simplifying that proceeding.

The negotiations took place between the National Marine Fisheries Service, the Department of Marine Resources, the State Planning Office, the U.S. Fish and Wildlife Service and the Kennebec River Coalition for over a year. The negotiations made tremendous progress because the Judge was a skilled facilitator, there was a clear structure to the meetings with rules and requirements, and there was a deadline with the current Administration's term soon over (Steve Adams, Pers. comm. 1/95). The Judge ultimately terminated these proceedings and the application process will begin. A primary reason these negotiations broke down was that there was no overriding reason for the dam owner to continue to negotiate.

2. Dredging

A contentious activity regulated by both Federal and State government is the dredging of harbors and channels. Dredging issues affect the fishing community, marine transportation, economic development and environmental concerns. There are issues around timing, how extensive the dredging is, who pays for what and where the dredge spoils are disposed. In recognition of the myriad issues that can arise within this permitting process, state and federal agencies have begun holding preapplication meetings to identify important issues of concern before an application is filed. While this is an important step, there are other opportunities for ADR within this process as discussed below.

B. State Level

State agencies use informal ADR techniques extensively in their day to day activities but may not acknowledge them as such. While the Secretary of State has no policy or guidelines on informal negotiated rule-making, most agencies that work in the marine environment get input on proposed rules from a variety of interested parties before the formal rulemaking process under the Maine Administrative Procedures Act. Outside of the rule-making process, staff members doing permitting may suggest less onerous options to an applicant. Also, many agencies have advisory bodies to help them identify and address issues in their field of concern. On the other hand, state agency use of formal mediation and arbitration is less frequent.

1. Submerged Lands Program

The Submerged Lands Program in the Bureau of Public Lands leases public land below the low water line for private use. Their jurisdiction in the marine environment is from the low water mark to the three mile limit. Marinas, private docks and wharves, and aquaculture activities all need submerged lands permits.

BPL went through a form of negotiated rule-making in developing its submerged land lease fees in 1989. A group composed of broad marine interests and backgrounds developed a mechanism to equitably fund submerged-lands permitting activities through their lease fees. This system was based on a hierarchy of preferred uses and a fee system that encouraged water-dependent uses at the expense of non-water-dependent uses.

BPL also resolves conflicts through their permitting process. Submerged lands permits often generate conflicts between private individuals and local user groups. According to Steve Oliveri, Resource Administrator of the Bureau of Public Lands, the key to this program's ability to resolve issues prior to permitting is the small staff and manageable workload. This allows site visits and the ability to become familiar with the project and local issues. The staff can talk with the different parties, identify common goals and generate options for resolving disputes, such as reconfiguring a marina proposal. BPL may only have about a dozen permits pending at any one time. The staff also has extensive experience in this area and can generate options and methods to resolve conflicts.

2. Department of Marine Resources

The Department of Marine Resources (DMR) works to conserve and develop the state's marine and estuarine resources. DMR uses ADR techniques extensively. For public input, they have a Marine Resources Advisory Council and Lobster Advisory Council created by statute, as well as ad hoc advisory groups that are established for specific resources. DMR uses informal negotiated rule-making for rules that affect a major industry such as mussel harvesting and the regulation of sea urchin harvesting. DMR has convened a task force to help develop diver requirements under the new sea urchin rules.

For specific disputes in the marine environment such as gear conflicts or harvesting disputes, DMR meets with local fishermen to resolve conflicts. However, Penn Estabrook, Deputy Commissioner of DMR, feels that ADR in this context will only work for a finite period of time and that it ultimately breaks down. He also finds that the fisheries community is not generally organized enough to be bound by the agreements made by the people representing them at the negotiating table.

DMR also permits the location of aquaculture leases through an adjudicatory hearing. Ken Honey, the Administrative Hearing Officer for DMR, encourages applicants to hold informational meetings and meet with local people before the application is filed even though these are not required. He finds that applicants that hold preliminary meetings have a much easier time during the formal leasing process, as local people know about the project and some issues have been identified and resolved before the hearing.

3. Department of Environmental Protection

The Department of Environmental Protection (DEP) practices informal ADR everyday through their permitting, enforcement and rule-making procedures. These techniques however, are not recognized as ADR techniques. DEP routinely does informal negotiated

rule-making by circulating draft rules to interested parties and holding workshops to solicit comments. DEP has recently amended their administrative rules for permitting to identify conflicts early in the permitting process. The new rules (CMR 06-096.02) require applicants to attend pre-application meetings with staff, hold a public meeting before the application is filed, and publish a notice of the major application. A hearing may be held if requested by the public and the Commissioner feels it is warranted. It is hoped that these public notices and meetings held early in the permitting process will identify issues to be resolved before the applicant has spent a large sum of money and time on the proposal and has fewer options.

Controversial permits and licenses are decided by the Board of Environmental Protection in an adjudicatory setting. These are contentious permits where often there is little mutual interest between the parties. According to Brook Barnes, Director of Enforcement and Procedures, when a permit or license application before the BEP becomes highly controversial and difficult, the parties are often suspicious of ADR techniques and do not want to take advantage of a mediated process because they feel they may undermine their position.

4. The Department of Transportation

The Department of Transportation (DOT) plans and develops transportation facilities and services for the state. In the marine environment, DOT acquires, constructs, operates and maintains harbor facilities to support the development of coastal resources, ports and harbors. DOT uses ADR in several different ways than other state agencies. DOT used a facilitated process to successfully develop the state transportation policy (see above) with over 60 people participating in defining transportation goals for the State. Currently, Regional Transportation Advisory Committees composed of diverse interests are developing regional long-range transportation plans.

DOT also uses partnering (see definition in section I) in many of its construction projects. The major contractor for the new Portland-South Portland Bridge met with Portland Harbor pilots, tugboat operators, oil terminal operators, USCG and others to delineate when the channel would be blocked or closed and affect navigation. They have given at least a one year notice of days when the channel will be closed. They also have developed a hotline for up-to-date information on the status of the project and channel.

Rob Elder, Director of the Ports and Marine Transportation Division, feels that there are several issues in port and harbor development that could use ADR techniques such as where to put transportation or freight facilities, how to use particular parcels of waterfront, and ferry services.

C. Municipal Level

Municipalities deal with disputes on a daily basis. These conflicts may be limited in scope but they can be extremely contentious. Municipalities deal almost exclusively with

informal ADR techniques: public meetings, special committees to address an issue and access to decision-makers. Two examples of formal municipal dispute resolution are included below.

1. Wells Beach Replenishment Project

In the wake of a contentious permit process for dredging their harbor, the Town of Wells took another approach to address beach replenishment just north of their harbor. In 1993, the Town of Wells, with the help of the Maine Coastal Program, created a Task Force on Beach Erosion to design an appropriate solution. The Task Force included a variety of governmental agencies and different groups that had worked against one another in the dredging permit process. An outside facilitator was hired to help design the process and facilitate the meetings. The Task Force met over the course of three months to develop a short and long range strategy for replenishment. The short range strategy was pursued immediately while the long range strategy needs further research before it can be implemented. The short-range strategy ran into problems during the permitting stage and the Town has reconvened the Task Force to develop alternative strategies.

ADR was not successful in this controversy because the agreement that was developed by the Task Force met with legal, operational and environmental concerns at the permitting stage of the process. The Task Force was successful in bringing people together to work toward a common goal and to find a workable solution. However, the Task Force asked state agencies to commit resources upfront and to give the staff the authority to advise the group on a potential decision. More time and resources would have been necessary to bring this to a successful conclusion, which many agency staff felt was beyond their capacity to fill. If ADR is to work in such situations, all parties must be willing to dedicate the necessary resources.

2. Portland Waterfront

In 1987, Portland voters passed a referendum banning any shifts to nonwater-dependent uses on the waterfront for 5 years. As that moratorium came to an end, the Waterfront Alliance, a group of landowners, citizen activists and fishing industry representatives with differing interests and views, hired a facilitator to help them develop recommendations for any amendments the City Council would adopt after the moratorium expired. This group recommended breaking the waterfront into three zones and developed language specifying the purpose of each zone with guidance as to allowable uses. Their work was embodied in a report subsequently adopted by the City Council and incorporated into Portland's comprehensive plan. While translating these goals and policies to technical standards and zoning language proved fractious and difficult, the City Council ultimately adopted the Waterfront Alliance's three zone concept and purpose statements. This zoning has remained in place for the past three years.

IV. Criteria for Successful ADR

Knowing when a dispute will benefit from ADR is important. The efforts outlined above have common traits that lead to their success or failure. Below are some of the criteria that should be met before trying to use for ADR techniques to resolve a dispute.

1. There are multiple parties with differing and possibly competing interests.
2. There is a realization by the disputing parties that the status quo will not work or is unacceptable.
3. There are organized, identifiable groups with representatives that can speak for the whole.
4. The parties are somewhat flexible and not constrained by internal policies, previous public positions, or budgets. State agency personnel need to have the authority or expertise to advise on permitting decisions.
5. There is a willingness to commit time and resources to resolving the dispute, in recognition of saving time and money later in the process. This translates into a strong commitment of staff time upfront with the hope of saving time later in the process.
6. There are overlapping jurisdictions and authorities by agencies or governments.

V. Where ADR Can Be Used in the Marine Environment

ADR techniques are important tools that can save time, money and alleviate conflicts. Using ADR to resolve disputes in the marine realm does have shortcomings that need to be recognized. ADR techniques are time-consuming and require an agency, municipality or organization to commit resources up front in the hope of reducing the workload overall. The people negotiating need to represent their constituencies and be able to commit them to agreements and decisions. Many of the interest and user groups along the Maine coast are not organized enough to meet this requirement.

In addition, marine environmental or transportation concerns may be constrained as to location without many options for negotiation. A sensitive species may need a particular habitat or site that cannot be compromised; a harbor may have few safe anchorages or suitable locations for a pier. And finally, there are the standards and requirements of state and federal law that constrain the development of options.

Despite these constraints, formal ADR techniques can be used more frequently in the marine environment. Areas where they hold promise are:

1. Dredging and the Designation of Dredge Disposal Sites

The Environmental Protection Agency, the U.S. Army Corps of Engineers, the DEP, the DMR, waterfront landowners and others have an interest in dredging activities. ADR is helpful when there are different jurisdictions and levels of government involved in an issue or project (i.e. state and federal). It can be used to foster communications, identify issues between agencies and try to resolve them early in the process. For example, DMR and the Army Corps of Engineers often have disputes over the timing of dredging operations. DMR wants to avoid dredging during the spawning season while the U.S. Army Corps wants to take advantage of favorable weather conditions.

2. Coordination of Interlocal Agreements

Towns may enter into interlocal agreements to manage and harvest their shellfish or other resources. Brunswick, Harpswell, West Bath and at one time Phippsburg had a regional shellfish agreement dating back to the early 1980s that allowed locally licensed clam diggers to harvest from any of the participating towns. The towns shared enforcement and management resources. Interpersonal conflicts prompted the Town of Harpswell to withdraw from the agreement in March, 1994. Had some form of mediation been used, this dissolution might have been avoided. One mechanism to ensure mediation in an interlocal agreement is to write the agreement so that mediation is required before the contract or agreement can be dissolved.

3. Marine Transportation

Some areas in the marine transportation area are well-suited to ADR techniques: siting of facilities, use of harborfront properties, development of competing or new infrastructure and ferry transportation issues. Marine transportation has many interest groups with competing or different interests that need to be addressed.

4. Fisheries

Although ADR is often used by the DMR in trying to resolve marine harvesting issues, its use could be expanded to deal with relatively local issues. Shortcomings, as voiced by Penn Estabrook, Deputy Commissioner of DMR, are that the fishing industry in Maine is not organized enough to give representatives at any negotiating table the voice and allegiance of the industry. However, in a more local setting, where the players are fewer and there is more accountability, ADR may work more effectively.

Another emerging conflict where ADR could be used is the lack of an articulated policy for recreational fisheries in the state. Recreational use of fisheries can sometimes conflict with commercial use of fisheries and there is no overall policy to guide how resources should be allocated. For example, on the Kennebec River there was a particularly large age class of young striped bass in 1994. Recreational anglers have been eager to protect this age class until it reaches reproductive age. They have been concerned that commercial alewife fishing with gill nets would catch a disproportionate amount of these young striped bass. There has not been a good forum to resolve this conflict.

In the wake of the controversy surrounding Amendment 5, a group of fishing interests is informally organizing to take advantage of any opportunities for ADR that may arise. The groups hope to build interest in the technique by fostering successful projects.

VI. Action Steps to Encourage ADR Techniques in the Marine Environment

Maine needs to undertake the following steps to encourage the use of ADR techniques in marine resource management.

1. Encourage the use of dispute resolution techniques in State actions wherever possible

Support the Interim Advisory Committee on Alternative Dispute Resolution recommendations to enhance Maine's use of ADR, with specific emphasis on marine issues. The Land and Water Resources Council should encourage agencies and municipalities to continue to identify and resolve marine resource issues before they become large-scale conflicts. This includes public outreach and information meetings and public notice. ADR should be considered in the development of a recreational fisheries policy (DMR), and the designation of dredge spoil sites (SPO).

2. Train state and local official in the use of dispute resolution techniques

State and local officials should be trained in the use of dispute resolution techniques. As recommended by the Interim Advisory Committee on Alternative Dispute Resolution. Staff should be encouraged to participate in dispute resolution sessions. A roundtable discussion with agencies involved with marine issues could help identify the issues where this can be best used.

The DECD should expand their codes enforcement officer training program to include dispute resolution techniques.

VII. Summary

ADR holds promise where agencies or organizations with differing responsibilities and jurisdictions are working on the same issue or project. The permitting of dredging projects involving state, federal and local governments with transportation, environmental, economic and fisheries interests is a prime example of where ADR techniques could be used to identify and resolve issues early on.

In researching options for ADR in the marine environment, specific statutory or regulatory obstacles to the use of formal or informal ADR techniques by state agencies or local governments were not found. The laws and rules state agencies operate under are almost exclusively specific to each agency, and agencies are designed in a hierarchical way to speak with one voice.

It appears that the major obstacles to using ADR in the marine environment are the difficulty in obtaining the financial resources to hire outside facilitators and the lack of experience using formal ADR techniques. This lack of experience translates into a lack of trust by the disputing parties and the inability to distinguish when ADR could help resolve conflicts.

References

Susskind, Larry and Jeffrey Crikchanke, 1987. "Breaking the Impass: Consensual Approach to Resolving Public Disputes" Basic Books

Moore, Christopher. 1991. "The Mediation Process: Practical Strategies for Resolving Conflict." Bass Publisher

Marine Protected Areas

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MARINE PROTECTED AREAS

Some areas are so important for the marine ecosystem and how it functions that they require special protection. Marine protected areas safeguard living resources, biodiversity, landscapes and seascapes to ensure that our marine environment can meet the challenges of the future. This may mean managing uses or limiting pollutant effects on those areas. Marine protected areas offer one method to protect ecologically important areas but they are by no means the only method. This paper discusses the theory behind marine protected areas and how this concept could be applied in Maine's marine waters.

I. The Importance of Marine Protected Areas

Marine protected areas can help to preserve an ecologically sensitive area that is an essential or unique habitat or important seed source. Marine protected areas are based on the fundamental ecology of marine organisms and offer benefits to both fishery and nonfishery interests. Marine protected areas can include a spectrum of management regimes from sanctuaries where no disturbance is allowed to species-specific conservation areas where only minor conflicting uses are managed. Management can be tailored to the specific ecosystems and conflicting uses of those ecosystems and may occur only during specific times.

Although marine protected areas are primarily intended to protect or enhance fisheries by protecting the quantity and quality of reproductive output, they also help protect biodiversity and reduce user conflicts by separating incompatible uses. They also can act as reference areas for study of natural processes with limited human disturbance. Finally, marine protected areas can provide an insurance policy against fishery collapse by offering a source for replenishing overfished stocks (Bohnsack, 1993).

II. National Marine Sanctuary Program

The mechanism for designating marine protected areas in federal waters is the Marine Sanctuary Program. The Marine Protection, Research and Sanctuaries Act of 1972 authorized the Secretary of Commerce to designate special areas as National Marine Sanctuaries to preserve or restore their ecological, historical, recreational or aesthetic resources while allowing uses compatible with that protection and preservation. Thirteen National Marine Sanctuaries have been designated within the United States to date: Florida, Texas, California, American Samoa, North Carolina, Massachusetts, Hawaii, and Georgia. These sanctuaries range in size from .5 square kilometers to almost 16,000 square kilometers. Michigan, Virginia and Washington have areas that are expected to be included in this program soon.

The primary goal of the National Marine Sanctuary Program is to protect threatened coastal and marine resources by balancing conflicting interest. The challenge for these

sanctuaries has been integrating multiple uses with preservation efforts. Increasingly they are designed with uses prohibited only in certain areas rather than throughout the sanctuary.

National Marine Sanctuaries offer states the opportunity to influence federal management of resources outside their state waters (3 miles), and often translate into additional funds for research and management. National Marine Sanctuaries are most important where offshore threats and use conflicts exist. Extractive uses, waste disposal and conflicts over use can be addressed through designation as a National Marine Sanctuary. Stellwagen Bank and the Florida Keys provide good examples of how these reserves are managed and the framework for developing management plans.

A. Stellwagen Bank

In 1993, Stellwagen Bank, off the coast of Massachusetts was designated a National Marine Sanctuary. It is the only National Marine Sanctuary within New England. An undersea sand and gravel deposit, the bank's topography creates upwelling of nutrient-rich water to support a diverse fish, invertebrate, and whale population. It is prime feeding ground for right, humpback and fin whales. NOAA's management plan for Stellwagen Bank contains several simple but important regulations that prohibit:

- * Sand and gravel mining;
- * Ocean dumping and discharging;
- * Alteration of or construction on the seabed;
- * Taking of marine mammals, reptiles and seabirds;
- * Placing submerged pipelines or cables; and
- * Vessel lightering (transfer of oil at sea).

NOAA also is empowered to take action against pollution that enters the sanctuary to the detriment of its resources. The management plan supports multiple uses of the area including fishing activities (Eldredge, 1993). This sanctuary exemplifies how designation provides a mechanism for a state to address offshore threats to important resources.

B. Florida Keys

In 1990, the US Congress designated the Florida Keys National Marine Sanctuary. It extends from just south of Miami to the Dry Tortugas, encompassing almost 8,898.5 square kilometers of the most heavily used coral reef tracts in the world. Attracting over one million divers a year, the sanctuary has many competing, often conflicting uses and overlapping jurisdictions and interests. Needless to say, the development of the Sanctuary Management Plan has proved a difficult process. NOAA formed an advisory group of public agencies, citizens, and public interest groups to augment the input of scientists, experts, managers and other decision-makers. The plan incorporated an operational level of detail that specified who would implement specific tasks, how much it would cost, and the expected results. NOAA was directed to consider ocean zoning as a management strategy within the plan and identified small, well-defined preservation areas and replenishment reserves to protect areas that represent the full range of the sanctuary's resources and habitat diversity (Ehler and Basta, 1993).

III. Why Designate Marine Protected Areas in Maine?

Some marine areas provide such a vital link in ecosystem functions that they require additional protection to guard against degradation or habitat destruction. Marine protected areas can provide this protection on a broader scale than can be afforded under Maine's current marine resource management scheme.

Maine has recognized some important marine areas, however, their management is not comprehensive. While DMR can designate conservation areas, protection is through a species-by-species approach and effects only harvesting and gear use. For example, the Jordan River mussel seed conservation area only addresses mussel harvesting. There are no guidelines for other uses within the river or land use considerations for land fronting the river even though other activities could impair water quality significantly affecting seed viability.

DEP's current water classification system also recognizes areas of ecological importance, but this designation only addresses water discharges. Areas that are designated SA for ecological reasons are not afforded wider protection from other threats, such as dragging or dredging. A broader, more comprehensive system is needed.

IV. Marine Protection in Maine

Maine has several important marine areas that are protected or managed in some way. Within State waters, the Department of Marine Resources (DMR) is empowered to restrict uses and the taking of specific species in certain areas for marine conservation within three miles of shore (12 MRSA §6171).

There are four mussel seed conservation areas designated by DMR: Jordan River, West Bay, Narraguagus Bay and the Harrington River. Mussel harvesting in these areas is prohibited without a permit. Similar restrictions apply to marine worm conservation areas. The DMR also manages 11 seed clam areas that are closed to the taking of clams, quahogs, mussels or marine worms. A portion of Sheepscot Bay, Booth Bay, Linniken Bay, and the Sheepscot River that is an important codfish spawning area, has been protected since 1907 when the area was closed to netting. The area currently is closed to the taking of any groundfish (DMR regs. 34.05). Between 1959 and 1979, an area stretching from Cape Small to Pumpkin Island was closed to dragging (P.L. 1959, ch. 363).

Maine also has pursued the creation of a federal National Marine Sanctuary. In the early 1980s, DMR and the Bigelow Laboratory submitted a proposal to designate a mid-coastal Maine marine sanctuary in the area extending seaward from the mouths of the Kennebec, Sheepscot, and Damariscotta Rivers (**reference**). This area was proposed because it exemplifies the coast of Maine; hosted features of biological interest including endangered and threatened species, spawning areas, marine mammals and unique species locations; and supports multiple uses including commercial and recreational fishing, light commercial marine traffic and recreational boating. The two overriding objectives of the proposal were to protect a unique juvenile cod

spawning area and to protect against potential sand and gravel mining. (The mouth of the Kennebec offers a clean plentiful source of sand ideal for concrete, roads and other uses.)

This proposal was not acted on by NOAA because local fishermen were concerned that the federal government would close the area to fishing (the statute does not allow this). Also, the program went into remission during the Reagan administration. The area remains on a list of possible candidate sites but it is not active. At a public hearing sponsored by a private citizen in 1993, the local fishing industry voiced strong opposition to the sanctuary concept.

This proposal differs from other sanctuary designations in that this area is within state waters. Creating a federal sanctuary in state waters raises several jurisdictional issues that need to be carefully considered. While the sanctuary designation has the potential to bring in federal dollars, it would also involve the federal government in management of state waters. A federal presence is seen by many as the first step toward regulating fishing in the area.

Because the proposed sanctuary is within state waters, Maine can protect these areas on its own. As noted above, DMR does regulate some types of fishing in this area. A state approach to marine protection allows us to define our own objectives and use protection strategies that are most appropriate for these areas. The drawback of a state approach is the lack of federal monetary support. Given the severe cuts DMR has been forced to make in recent years, this is an important concern.

V. Implementation Concerns

Developing, designating, and implementing a system for marine protected areas is difficult and controversial. This section identifies six major efforts that need to take place.

A. Expand Marine Habitat Classification and Research on the Ecology of Nearshore Environments

The marine habitat classification, designed by the Natural Areas Program, represents a first step in understanding the importance, abundance and significance of marine areas. The document, *"A Classification System of Marine and Estuarine Habitats in Maine: An ecosystem approach to habitats. Part I: Benthic habitats,"* (Brown, 1993) needs additional work to fill in the gaps. This program is funded by the Coastal Program through FY 1994-95, but additional support will be needed. Currently we don't know what areas are most important and how extensive they are. The Maine Coastal Program should explore funding for the program through FY 1995-96.

B. Develop a Ranking System or Priority List of Resources of Concern

As part of the 1994-1995 program year, the Natural Areas Program, in conjunction with the State Planning Office is developing a system to identify important features and types of marine communities that warrant protection. The criteria used to rank marine communities include:

- * Biodiversity;
- * Economic value and the linkages an area provides;
- * Uniqueness and its importance in the ecosystem;
- * Essential habitats for marine species, including spawning habitats, nursery areas and other habitats critical during specific stages of marine species life cycles. This review should include information on noncommercial species as well as commercial species;
- * Replenishment sources, such as important seed areas or nursery grounds; and
- * Potential threats to these resources.

Based on these criteria, a cross-disciplinary group with marine resource expertise should be brought together to identify resources worthy of protection.

C. Development Management Guidelines

A set of management guidelines needs to be developed for marine protected areas to minimize disturbance to important areas. These management guidelines may include land use recommendations, gear use constraints or harvesting restrictions. In addition, enforcement or management tools need to be explored. Any program for marine protected areas must also provide a mechanism for local technical assistance. The Maine Coastal Program and Natural Areas Program currently are working with the Damariscotta River Estuary Project to determine if such guidelines can be developed. If these are successful, additional work needs to be done to see if they can be translated to other areas.

D. Research the Legal and Governmental Issues

Maine needs to review the legal implications of developing a system for marine protected areas that explores the best mechanism for management. If marine protected areas are designated, a system for developing a management plan needs to be established. Enforcement issues must also be addressed.

E. Build Public Awareness about the Need to Protect These Resources

The state must build a constituency for marine protected areas. Any discussion on restricting uses on a working coast is bound to stimulate controversy. Consensus, outreach and public education are needed to build the networks and support necessary to move forward. We need to work with the existing network of educational institutions to educate people on the importance of our near-shore resources and the need for their protection.

F. Monitor the Need For Additional Protection Around Sheepscot Bay

The Sheepscot River area proposed for designation as a Marine Sanctuary should continue to be monitored to ensure that the resources that make this area so special are not at risk.

VI. Summary

Marine protected areas offer a mechanism for states to ensure the integrity of ecologically important species and habitats. To some extent Maine protects important marine resources within state waters now, however these efforts are usually on a species by species approach and not comprehensive. Designation as a National Marine Sanctuary affords protection for areas outside state territorial waters and has the potential to bring funds for management and research into the state. However, any federal designation within State waters can raise jurisdictional issues with the federal government. This section recommends preliminary steps to expand marine protection for a more comprehensive approach.

References

- Bohnsack, James A., 1993. Marine Reserves: They enhance fisheries, reduce conflicts and protect resources. *Oceanus*, Fall: 63-71.
- Brown, B. 1993. "A Classification System of Marine and Estuarine Habitats in Maine: An ecosystem approach to habitats. Part 1: Benthic habitats" Natural Areas Program, Maine Department of Economic and Community Development.
- Ehler, Charles N. and Daniel J. Basta, 1993. "Integrated Management of Coastal Areas and Marine Sanctuaries; a new paradigm." *Oceanus*, Fall: 6-12.
- Eldredge, 1993. Stellwagen Bank. *Oceanus*, Fall.
- Maine Department of Marine Resources. 1972. Proposal for Sheepscot River Marine Area.

Marine Zoning

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MARINE ZONING

As the pressures to use our marine resources grow, conflicts in our marine areas will grow. One mechanism to reduce these conflicts is through marine zoning. Zoning marine areas can address cultural, economic and environmental issues and reduce conflicts, provide resource users with predictability and reduce regulatory workload. It can funnel heavy use into areas that can absorb it, while protecting sensitive areas. Marine zoning can help minimize marine resource conflicts by identifying designated or priority uses as well as incompatible uses for an area. Zoning can be done in very limited areas of particular importance or coastwide.

Marine zoning differs from land-use zoning in that marine waters are a public resource to be managed for the public trust. There is no takings issue with marine zoning. However, any discussion of marine zoning must include the impacts on and needs of traditional user groups that have always had access to these resources.

I. Current Forms of Marine Zoning in Maine

Maine does have discrete, albeit disjunct forms of marine zoning now. These forms usually cover only one activity and are usually very local. For example:

- * Marine water quality is classified SA, SB, or SC according to its quality and various restrictions are placed on discharges according to their impacts. Waters with outstanding natural resources are classified as SA, with no direct discharges allowed. SB waters are unimpaired and discharges are allowed that do not cause adverse impacts to estuarine and marine life. Discharges are allowed into SC waters as long as the structure and function of the resident biological community is maintained.
- * Shipping lanes and harbor approaches are designated for commercial vessel traffic. Anchorage areas and places where oil-carrying vessels can transfer, or lighter, their cargo, also are designated in Maine's major harbors.
- * Marine resource conflicts are prevented by statutory prohibitions for certain activities around aquaculture leases and permitted fish weirs. For example, 12 MRSA §6957 limits dragging or trawling within 500 feet of an aquaculture lease with floating aquaculture equipment. Lobster traps are prohibited within 300 feet of the mouth of a permitted fish weir by 12 MRSA §6435, while 12 MRSA §6525-A prohibits setting nets within 2000 feet of a fish weir.
- * Harbors are managed by many municipalities to reduce conflicts between boaters. Harbor management plans may include travel lanes and designated mooring areas for specific users.

II. Marine Zoning in Other States

Several states already use marine zoning. This section contrasts examples from Rhode Island and Oregon. Rhode Island zoned their entire coast according to how it is currently used. Oregon, on the hand, zoned only their estuaries, based on the habitat types found within.

A. Rhode Island

Rhode Island has zoned its 420 mile coastline and near-shore waters based on the current use of those zones. The six zones used in waterfront and near-shore area zoning include:

1. **Natural Shoreline** – Includes conservation areas, undisturbed scenic areas, and areas unsuitable for building. Recreational boating facilities, point source discharges, filling, and any industrial or commercial structures (except related to fishing and aquaculture) are prohibited. Dredging is not permitted nor are moored houseboats or businesses.
2. **Residential** – Areas with high scenic value that support low intensity recreational and residential uses. Small scale alterations consistent with residential waterfronts are allowed. New boat launches are allowed.
3. **Commercial Facilities** – Densely developed recreational boating facilities. Include recreational support facilities and water dependent uses. Recreational boating uses are considered the highest and best use.
4. **Open waters of the Bay or Sound** – Waters that support or could support a variety of commercial and recreational activities. A balance of water dependent uses is encouraged.
5. **Commercial or Recreational Harbors** – Waterfront areas that support a variety of tourist, recreational and commercial activities. Water dependent uses are the highest priority use for these waters.
6. **Water Dependent Commercial and Industrial Zones** – Extensively altered water areas for commercial and industrial water-dependent activities. These areas are managed to support commercial activity related to shipping and commercial fisheries.

Seventy percent of Rhode Island's shoreline is included in zones 1 and 2. Apparently, these designations have been very political. Despite problems, zoning has been effective in managing uses. Rhode Island's major marine-related land-use problems are finding mooring space for recreational boats and utilizing extensive defense facilities that are no longer in use by the Federal Government.

Zoning according to current use works well in a small state with a heavily-used shoreline. This management scheme is also complimented by special area management plans for significant ecological areas, primarily salt ponds.

B. Oregon

Oregon has chosen a different approach for avoiding conflicts through marine zoning. They have a "bold" coast, a straight shoreline with few coves and harbors. Beaches along the coast are publicly owned. Estuaries are the focus of recreational, fishing and industrial activity. Their program encompasses 17 estuaries, recognizing that these areas are vital environmental resources as well as recreational, industrial and commercial resources. Estuaries are classified into the following zones according to the habitats and characteristics within them:

- 1. Natural Areas** – Important natural areas without jetties or channels with resources that are managed for protection. Uses allowed in these areas are limited.
- 2. Conservation Areas** – Significant habitat adjacent to development or significant habitat that is of a smaller scale than in category.
- 3. Development Management Units** – Areas of minimal biological significance. These areas are managed to provide for navigation, public or industrial water-dependent uses. Areas are further broken down into deep water draft areas and shallow water draft areas.

Oregon's marine zoning is usually developed on a county level but must be locally-approved. Each zone has designated permissible uses that are reviewed only as to whether they require dredging or filling. "Resource capability uses" are those activities that may or may not be consistent with the zone and require a review of the effects of the proposed activity on other uses, resources of the area, and the management objective for the estuary. The project must also be reviewed for dredging and filling and an overall assessment of impacts. Mitigation must be considered for projects that propose to dredge or fill portions of estuaries.

III. Issues for Zoning Marine Areas in Maine

Marine zoning has many advantages for Maine. Its strength lies in the fact that it can be used as a means to reduce conflicts between various user groups, for example, harbor traffic lanes can be designated to avoid damage to fixed gear set within a harbor. Marine zoning can also protect economically important areas such as intertidal areas important for shellfish harvesting or eel grass beds, suspected nursery areas for important marine species. Shellfish flats within a specific radius of marinas are closed by the U.S. Food and Drug Administration. Marina exclusion zones could be designated around particularly productive shellfish flats.

Marine zoning can promote uses such as aquaculture by identifying preferable areas and simplifying the permitting process. Cumulative impacts can be avoided and sensitive areas

protected by focusing development or impacts into areas that are best suited to absorb them. Finally, marine zoning can identify important areas up front and develop guidelines for their use.

While there are many advantages, there are numerous issues involved with marine zoning in Maine. These include the following:

A. Approach to Zoning

We need to explore the most appropriate zoning scheme given our extensive shoreline. Rhode Island offers a scheme of zoning the entire coast according to current uses. The Oregon approach is based on existing habitat and only zones areas where the potential for conflicts is greatest. Maine's long coast seems best suited for local zoning through a comprehensive planning process, optimally in coordination with other towns, according to state guidelines for important or high use areas. This approach would allow local areas to decide how they want to go about zoning and which uses should be encouraged in each area. Although similar in concept to how Shoreland Zoning is administered in Maine, this program would be more limited in scope and involve different constituencies.

We also need to explore the legal authority for developing any zoning scheme; whether municipal home rule authority extends to submerged lands allowing municipalities to regulate this area. While towns engage in harbor planning through reference to home rule authority, it is unclear whether this authority extends to more comprehensive zoning schemes. The State, as owner of submerged lands, retains ultimate responsibility for public trust lands.

The State Planning Office should work with the Bureau of Public Lands and the Marine Law Institute to determine the legal authority for zoning near shore waters.

B. Identification of Marine Resources

Maine needs to have more information on the types and ranges of habitats that occur beneath our waters. The Maine Natural Areas Program, with funding through the Maine Coastal Program, is developing a classification system for these habitats. This classification system and subsequent management guidelines can help determine:

- * Habitats that are significant and worthy of protection;
- * Common habitats that are prevalent throughout the marine environment;
- * Management restrictions that should be in place to protect ecologically important areas; and
- * Areas most appropriate for heavy or specialized use.

This information can form the basis for state guidelines for marine areas.

The Maine Natural Areas Program should continue its work on developing the Classification and Management Guidelines to evaluate habitats that are worthy of protection and areas most appropriate for heavy or specialized use.

The next step for implementing marine zoning is for towns to look at their resource and determine the most appropriate areas for a variety of uses. They also should identify areas most vulnerable to disturbance such as eel grass beds.

C. Management of Marine Zoning or Schemes

Any marine zoning scheme needs to be based on goals and objectives, relate to a regional plan for the area and be consistent and coordinated on a regional level. Neighboring towns should have uniform guidelines and designations. The state could prepare guidelines and general recommendations to save each town from researching the best management measures.

D. Permitted Uses through Zoning

Maine could streamline the permitting process for certain uses within marine zones similar to the approach Oregon has taken. There may be an opportunity to improve on Maine's current permit-by-rule system by linking it to certain zones and incorporating performance standards for these zones. For example, building wharves falls under DEP's permit-by-rule requirements. In some areas, these activities pose little threat, while in other areas a proliferation of docks could be detrimental to a productive shellfish area or wildlife concentration area.

The Department of Environmental Protection should explore expanding Maine's current permit-by-rule system to activities in certain marine zones.

IV. Summary

Marine zoning offers a mechanism for Maine municipalities to begin to manage some of the conflicts over marine resources. Two approaches to marine zoning are explored in this paper. Zoning based on habitat types and limited to significant high use areas is most appropriate for a coastline like Maine's. Before we can institute a scheme for marine zoning, a number of issues need to be resolved including, the framework for zoning, legal mechanisms, better information on marine resource types and how zoning would be managed.

References

Oslon, Steve and George Seavey, *The State of Rhode Island: Coastal Resources Management Program, 1977*. University of Rhode Island.

Department of Land Conservation and Development. 1987. *The Oregon Estuary Plan Book*.