Oregon Ocean Policy Advisory Council

Report and Recommendation to the Governor
Oregon and Marine Reserves

August 16, 2002

Oregon Ocean Policy Advisory Council
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Executive Summary

Overall Recommendation

After nearly two years of study of marine reserves and protected areas in the U. S. and worldwide, the Oregon Ocean Policy Advisory Council (OPAC) finds that sufficient evidence exists to RECOMMEND that:

a. Oregon establish a limited system of marine reserves in order to test and evaluate their effectiveness in meeting marine resource conservation objectives; and

b. before designating any specific marine reserves, Oregon must acquire additional information and conduct additional study, analysis, and deliberation through an open, public process with extensive stakeholder involvement.

The OPAC makes NO recommendation at this time about either

- a specific system of reserves or area locations;
  or
- the use of marine reserves for fishery management.

The OPAC finds credible policy and scientific evidence that marine reserves can help Oregon to meet marine conservation objectives in Statewide Planning Goal 19, Ocean Resources, and may assist in reaching other state objectives such as fisheries enhancement and management, pollution control, recreation, tourism, and education. This evidence suggests that a carefully designed system of reserves, even if limited, can provide both conservation and research information benefits. Substantial evidence also exists that a careful public planning and assessment process involving all stakeholders is critical to the eventual acceptance and success of such reserves.

Goals and Objectives

The goal of such a system and process is to help Oregon to meet the conservation objectives of Statewide Planning Goal 19, Ocean Resources, which include maintaining the long-term benefits of renewable marine resources and protecting marine biodiversity, important marine habitats, and areas important to marine fisheries.

Objectives of the planning and evaluation process are to:

1. establish ecological reference areas as part of an integrated management strategy in significant rocky shore and marine habitats in the territorial sea and on the continental shelf;

2. test the effectiveness of these reserves in maintaining and restoring ecological integrity;
3. provide a strategic framework for appropriate research funding; and
4. increase understanding and awareness of Oregon's marine resources.

Specific long-term goals and objectives of the system will be developed during the planning and evaluation process.

Recommended Process for Public Stakeholder Participation
The Ocean Policy Advisory Council RECOMMENDS an open, participatory two-phase process involving all stakeholders to plan and evaluate a system of reserves along the Oregon coast that will meet conservation objectives, provide valuable information, and maximize other public benefits, while avoiding or minimizing adverse effects on fisheries, other ocean users, and coastal communities.

- Phase One: The OPAC proposes that a reserve planning committee be established with members from stakeholder groups, agencies, scientists, and others to prepare a coastwide framework plan. A separate scientific advisory panel would provide independent information and advice to the reserve planning committee and OPAC to ensure separation of policy development from scientific analysis. As part of this process, focus on the Rocky Shores Management Strategy will be supported by staff from affected state agencies. The OPAC would approve the coastwide framework plan after public review and assessment of such factors as the potential economic, management, and ecosystem effects, costs, benefits, funding needs, and implementation.

- Phase Two: The coastwide framework plan would be carried out over time, resources permitting, through a locally-oriented public process that would result in a plan for each reserve. No reserve would be implemented until an analysis of the ecological, economic, and social effects was completed. Reserves might be implemented through a variety of means such as local advisory committees; state agency programs such as those of the Oregon Department of Fish and Wildlife, Parks and Recreation Department, and Division of State Lands; or legislative action. Reserves would be reviewed at intervals to assess performance and determine whether continuation, modification, or termination is warranted.

The OPAC intends a broad interpretation of the term "stakeholder" to include all affected or interested parties, groups and individuals because all have important contributions to make in carrying out this proposal. An open, participatory, step-wise planning and evaluation process will enable all interested parties to be involved in all phases of this process.

Terminology:
The OPAC concludes that Oregon's Territorial Sea is, in effect, a *marine protected area* because it is a distinct ocean area identified in state law for management through an integrated set of laws and regulations for multiple uses and purposes. The OPAC therefore focused its study and recommendation on *marine reserves*, which refers to a highly regulated ocean or estuarine area designated to meet specific goals and to protect resources or uses from activities that may conflict with these goals. While Oregon has a number of marine areas that are specially managed or protected along the ocean shore, none are "fully-protected."

Public Participation
All OPAC and Working Group meetings were open to the public. Several were well-attended. A special website (http://oregonocean.org) was launched to enable public access to all study materials, meeting notes, and other information about marine protected areas and reserves.

An initial draft of this recommendation was widely reviewed by the public in late spring 2002 and received a wide range of comments from many people. Comments ranged from outright rejection of the idea that marine reserves should be considered, to assertions of the need to enact reserves immediately. The Ocean Policy Advisory Council acknowledges the concerns raised, questions asked, and comments made and concurs that more information, discussion, and step-wise planning and evaluation are needed prior to the designation of specific reserves.

Funding
The OPAC acknowledges that funding will be a significant factor in carrying out this recommendation. The proposed public process will require staff, logistical, and information support. The OPAC RECOMMENDS that the Governor and Legislature provide core funding from state sources in order to leverage additional funds from other sources.

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Background

Request for Recommendation

This recommendation responds to a request from the Governor's Office in July, 2000, for the OPAC to gather facts, engage the public, fishing industry, and other interested parties in a thorough deliberation of the issue of marine protected areas, and provide recommendations on state policies appropriate to the Territorial Sea Plan before making any decisions about additional area-based management in Oregon's Ocean Stewardship Area.

The Governor's Office cited several nationwide and regional developments in marine protected areas as reasons for Oregon to assess the issue and develop a response based on policies in Goal 19, Ocean Resources, the 1990 Oregon Ocean Resources Management Plan, and the 1994 Oregon Territorial Sea Plan (see http://oregonocean.org for memo from the Office of the Governor).

Study Process

The OPAC gathered a wide variety of information and heard reports and presentations about marine protected areas, marine reserves, fisheries, economics, and other related issues from many experts, including scientists from a variety of disciplines, fishermen, divers, and local officials, among others. In October 2000 the OPAC held a two-day symposium on marine protected areas and heard presentations from a range of local, regional, and national speakers on a variety of policy, management, biologic, social, and economic topics. At the end of January 2002 the OPAC conducted a two-day *Dialogue With Experts*, including local experts and scientific experts. (see http://oregonocean.org for summaries of these and other meetings).

A working group of OPAC members carried out the detailed work of analyzing the issues, learning from scientists, managers, and ocean users and developing a well-founded recommendation based on the principles and objectives in Goal 19 (see http://oregonocean.org for staff Study Papers). Several other OPAC members participated with the working group process, as did various stakeholders and interested individuals who came to a dozen meetings to offer opinions and insights. A special Internet website http://oregonocean.org was created on which working group information was posted and made available to the public (see http://oregonocean.org for a list of working group members and meetings).

An extensive body of published scientific literature exists for the topics of marine protected areas and marine reserves around the world. Working Group members reviewed several of these including a comprehensive study of marine protected areas produced by the Ocean Studies Board

of the National Academy of Sciences in 2001. Various OPAC members and staff attended other conferences, workshops, and meetings on marine protected areas and reserves. (See Appendix A for a selected bibliography).

Public Review and Comment

An initial draft of this recommendation was widely reviewed by the public in late spring 2002 and received a wide range of comments. Eleven public meetings were held, including six in coastal cities, which more than 450 people attended. About 200 written comments were received. Comments tend to fall at opposite ends of a spectrum of opinion, ranging from outright rejection of the idea that marine reserves should be considered to assertions of the need to enact large reserves immediately.

Both oral and written comments included questions about adequacy of scientific information to manage marine resources and designate reserves; concerns about potential economic impacts of reserves on fishermen, ocean users, and communities; lack of specificity about how big, how many, and where reserves should be; citations that ample evidence exists to support a stronger, bolder proposal with a faster designation process; concerns about the potential ecological consequences of not implementing reserves; duplication of other management programs; and the need for all interested groups to be involved in planning for and implementing reserves. (See http://oregonocean.org for summary of public meetings and copies of all comments received by e-mail and US mail).

The Ocean Policy Advisory Council acknowledges these concerns and concurs that more information, discussion, and step-wise decisions are needed.

Policy Basis for Recommendation on Marine Reserves

The OPAC concludes that marine reserves may enable the state to meet and promote the policies and objectives in Statewide Planning Goal 19, Ocean Resources. The overall goal of Goal 19 is:

> *To conserve marine resources and ecological functions for the purpose of providing long-term ecological, economic, and social value and benefits to future generations.*

The objectives of Goal 19 provide a framework for the process of planning to test a system of marine reserves. These objectives are to:

- *maintain and, where appropriate, restore the long-term benefits derived from renewable marine resources;*
- *protect renewable marine resources--i.e., living marine organisms--from adverse effects of development of non-renewable resources, uses of the ocean floor, or other actions;*
- *protect the biological diversity of marine life and the functional integrity of the marine ecosystem;*
- *protect important marine habitat, including estuarine habitat, which are areas:*
  - *important to the biological viability of commercially or recreationally caught species;*
  - *needed to assure the survival of threatened or endangered species;*
  - *ecologically significant to ecosystem, and biological productivity and diversity;*
  - *essential to the life-history or behaviors of marine organisms;*
  - *vulnerable because of size, composition, or location in relation to pollutants, noise, physical disturbance, alteration, or harvest; or*
  - *unique or of limited range within the state; and,*
- *protect areas important to fisheries, which are:*
  - *areas of high catch (e.g., high total pounds landed and high value of landed catch); or*
  - *areas where highly valued fish are caught even if in low abundance or by few fishers; or*
  - *areas that are important on a seasonal basis; or*
  - *areas important to commercial or recreational fishing activities, including those of individual ports or particular fleets; or*
  - *habitat areas that support food or prey species important to commercially and recreationally caught fish and shellfish species.*

See http://oregonocean.org for full text of Goal 19, Ocean Resources.

In addition, the OPAC suggests that the Rocky Shore Strategy in the Territorial Sea Plan be considered as a model for carrying out this recommendation. That strategy includes a coastwide ecological framework; overall goals, objectives, and protection criteria; site-specific inventories and analysis; and management prescriptions that are specific to each site. It was adopted by the OPAC as part of the Territorial Sea Plan and is implemented through a variety of programs including state agency regulations and local non-governmental conservation activities.

What the Ocean Policy Advisory Council Learned

During the course of its assessment, the OPAC learned that the issue of marine protected areas and marine reserves is a microcosm of all aspects of the topic of marine conservation and ocean governance in general: law and politics, state-federal relations, economics, the role of scientific study, technology, individual core beliefs, community identity, and cultural aspirations. The OPAC learned that Oregonians care deeply about the coast and marine environment even if they may differ in the steps needed to assure long-term conservation of resources and sustainable ocean-based economies.

The OPAC members heard and considered many aspects of this issue. The most important factors in their decisions were:

Oregon's Existing Ocean Management and Protection

Oregon has a sound ocean policy framework for considering and testing marine reserves.
Statewide Planning Goal 19, Ocean Resources, is unique in the nation. First adopted in 1977 and amended in 2000, it sets out broad state policy objectives and standards for conserving ocean resources, principally with regard to long-term protection of living marine resources, biological diversity, important habitats, and important fishing areas. The 1991 Oregon Ocean Resources Management Act (ORS 196.405) creates an Ocean Resources Management Program, including the OPAC, requires a plan for state ocean waters and establishes a process for engaging all interested parties in the issue of marine reserves.

Oregon's Territorial Sea is already a marine protected area.
Oregon's three nautical mile-wide Territorial Sea meets several definitions of a marine protected area. The National Academy of Sciences report defines a marine protected area as:

> *An ocean or estuarine area designated to conserve marine resources through an integrated management plan that includes broad regulations for some uses and greater regulations of other uses, and may include sub-areas that are highly-regulated for specific purposes.*

Oregon's Ocean Resources Management Program under ORS 196.405-.515 creates such an integrated management regime for Oregon's state waters.

Oregon has a history of identifying conservation, protection, and stewardship needs for natural resources.
The Rocky Shores Management Strategy, an element of the Territorial Sea Plan, states that "[l]ike other shore areas around the world, Oregon's seemingly durable rocky shores harbor many uniquely adapted life forms that are vulnerable to the activities of mankind. There is no one threat. Rather, a web of combined causes poses the potential for habitat loss and destruction." Chapter 111 (Health of Natural Systems and Resources) of The Oregon State of the Environment Report, 2000 contains the following conclusion: "…with increasing human population, coastal development, and recreation use of marine environments, more protection may be needed, particularly for unprotected nearshore reef ecosystems threatened by overfishing, habitat alteration, oil spills, and dredged material disposal."

Oregon has numerous small marine managed areas along the coastline.
An inventory of Oregon Marine Protected Areas (see http://oregonocean.org for Oregon MPA Inventory, April 2001) lists many managed areas in Oregon's state ocean waters and estuaries. These are principally rocky intertidal sites in the Oregon Territorial Sea Plan that are protected by state regulations, offshore rocks and islands and four estuarine sites in the National Wildlife Refuge System with state regulations that add additional protections, the South Slough National Estuarine Research Reserve on Coos Bay, and estuarine areas protected by local, state, and federal laws and regulations.

Oregon has no area that can be considered a "fully-protected" marine reserve.
A marine reserve is defined in the National Academy of Sciences report as

> *A sub-category of marine protected area; a marine reserve is an area that is designated to meet specific goals and is highly-regulated to protect resources or uses from activities that may conflict with these goals.*

There are many kinds of marine reserves worldwide established for various specific purposes to meet specific circumstances. Some are "fully-protected," others are not. An inventory shows that while many of Oregon's marine managed areas have specific goals and regulations to protect resources, none of these areas meets the definition of "fully-protected." Whale Cove is a 30-acre site north of Newport where both the intertidal and subtidal areas are regulated to prohibit harvest of fish and invertebrates. Because marine algae (seaweed) may be collected, this area is not a fully-protected marine reserve.

Oregon's Ocean Fisheries and Ecosystem Conditions

Some ocean areas off Oregon are protected from or unavailable to some fishing activities.
A number of ocean areas on the Oregon continental margin are not available or are "off-limits" to some fishing activities under various circumstances. Most of these are in federal waters. Such limitations on fishing include federal regulations on the type of fishing gear allowed; regulations on harvest of protected fish stocks; topography or geology of the seafloor; and the presence of shipwrecks on the seafloor. Some sites nearer to shore have limited use because of danger from waves and rocks or due to distance from fishing ports. Such areas might be candidates for consideration as marine reserves.

Fishermen and coastal communities are concerned about changes in ocean fisheries and loss of fishing areas and income.
Ocean fisheries along the West Coast, particularly for rockfish, are undergoing major restructuring to account for over-capacity in the fishing fleet and to meet federal regulations to protect stocks of fish listed as overfished under federal law. In light of these changes, fishermen view marine reserves with alarm and argue that reserves are unnecessary and potentially damaging to fishermen, local economies, and coastal communities. Such concerns, common to those expressed worldwide whenever reserves have been proposed, were strongly voiced at some public meetings on a draft of this recommendation.

Better scientific information is needed to manage and conserve marine resources.
Marine resource managers often have inadequate information on the marine environment, status of resources, ocean uses, and the effectiveness of management decisions or their effects on

marine ecosystems. Full assessments of most fish stocks along the West Coast have not been completed. The life-histories and ecological relationships of many marine species are not understood. Marine habitats and conditions have not been completely inventoried. No known control sites exist in Oregon to distinguish the effects of natural variability from the effects of human activity in the marine environment.

Fishermen and other ocean users have information about the marine environment that is unique and valuable.
The information and knowledge of fishermen and other ocean users, gained from years of work on or around the sea, is a valuable asset to the State of Oregon that can help to inform the process of planning, managing, and assessing marine reserves. Engaging fishermen and other users in a participatory process with scientists and managers is essential to ensure that this information is incorporated into the OPAC process.

Oregon's Coastal Tribes have information about the marine environment that is unique and valuable.
The native people of Oregon's coast retain the memory of a healthy coastal ecosystem, which changed drastically at the turn of the 19th century. In 2001, Coastal Oregon tribes, the Affiliated Tribes of Northwest Indians and the National Congress of American Indians all passed resolutions endorsing efforts to restore the health and balance of Oregon's coastal ecosystem through the process of restoring the extirpated populations of the plant and animal communities. Scientists in Oregon have recently verified knowledge of the changes.

Conservationists and many in the general public are concerned about perceived declining conditions in the ocean and support area-closures for conservation.
News reports are the primary means of public information about the condition of the marine environment. News stories about declines in worldwide fish catch, headline-making fishery restrictions along the West Coast, increases in harmful algal blooms, and large ocean pollution events have heightened public concern for the sustainability of the marine environment and stimulated calls for new measures, such as marine reserves, to conserve marine resources.

Ecological responses of marine reserves depend on many factors, including their environmental setting, size and number.
The Pacific Ocean off Oregon is a segment of the much larger dynamic, variable, and biologically productive California Current Ecosystem, which is a set of ocean conditions and associated biota that extend along the continental margin of North America from British Columbia to Baja California. Although these conditions and biota--and the economic uses of them--are similar throughout the region, they vary widely over many time scales and spatial scales and must be analyzed and considered in relation to the potential locations, sizes, and number of sites in a system of marine reserves to be tested along the Oregon coast.

Marine Managed Areas in Other Areas Offer Valuable Lessons

Oregon can learn from marine protected areas and marine reserves that exist worldwide.
Area-based protections have been implemented for many reasons in different circumstances in a diversity of marine environments. The Ocean Studies Board of the National Academy of Sciences, as well as others, have assessed the performance of many marine protected areas and

marine reserves worldwide. A wealth of scientific data and information from these assessments is available in published scientific literature and, increasingly, on the Internet. While some areas are more successful than others and the settings vary widely, the experience of these reserves can help shape Oregon's assessment and planning. (See Appendix A for a selected bibliography).

Studies of existing West Coast research reserves suggest beneficial ecological changes would result from establishing marine reserves off Oregon.
A scientific assessment of nearly a dozen small reserves along the West Coast, including seven that could be considered "fully protected," show that for a variety of fished species, reserves are effective in producing substantially more and larger fish that produce more eggs compared to areas outside the reserves that are fished. These studies predict that such increases are likely to benefit fisheries outside the reserve because many fish species move during their lifetimes, producing "spillover" of adults from reserves to fished areas. Likewise, increased egg and larva production from larger fish in reserves is expected to "seed" down-current areas or areas adjacent to the reserve.

Marine reserves can be an effective management tool for certain purposes, but not all.
The National Academy of Sciences concluded that marine protected areas, including restrictive reserves, can be effective in conserving and protecting marine ecosystems, especially if used in conjunction with other regulations and incentives and if they are designed to meet clear goals and objectives. Marine reserves are not, by themselves, appropriate tools for all resource- or use-management situations.

A system of sites is needed to test the effectiveness of marine reserves for conservation purposes.
The marine environment along the Oregon coast is long (360 miles), varied, fluid, and dynamic. Experience elsewhere indicates that a single reserve is unlikely to provide sufficient experimental results about reserve performance to meet conservation objectives and suggest that a carefully designed system of reserves in several locations will better account for a range of conditions, habitats, resources, and uses, and support more statistically valid conclusions about the performance of reserves. The number, size, and location of reserves in the system will be determined through a process that is based on specific goals and objectives and considers a wide range of biologic, oceanographic, economic, social, and other information.

Many Factors Contribute to the Success or Failure of Reserves:

Stakeholder involvement.
Active involvement of all stakeholders throughout all phases of planning and management of reserves is essential. Planning and management groups made up of stakeholder representatives have proven successful elsewhere. Such a process, using the knowledge and expertise of ocean users as well as scientists, is likely to lead to more cost-effective reserves that are accepted and supported locally.

Clear Objectives
Specific, clear objectives for a system of reserves and, eventually, for individual reserves, are essential. These should be reviewed over time and amended as needed to account for learning and experience.

Account for Local Conditions
Local conditions, attitudes, and needs must be accounted for. The Oregon coast is 360 miles long. Coastal communities, ocean use patterns, physical ocean and water quality conditions, and ecological composition vary widely. A coastwide framework plan must account for this variety of conditions along the entire coast and individual reserve management plans must be tailored to local conditions.

Local Implementation
Locally based management, including enforcement, is essential and will depend on the participation of local stakeholders in all phases of the reserve planning and implementation.

Periodic Evaluation
Reserves must be monitored and evaluated periodically to determine effectiveness and performance and make necessary adjustments in objectives and management.

Adequate Funding
Adequate funding is necessary to plan for, establish, manage, and monitor reserves. Additional funding will be required to conduct scientific research, including cooperative research with fishermen, necessary to test and evaluate the effects of individual reserves and the reserve system. The overall framework plan proposed by the OPAC will greatly enhance the ability of the state to seek and acquire needed funding from a variety of sources.

Integrated Management
An overall marine management program enhances the likelihood of success of reserves. Unlike many other states and the federal government, Oregon has an integrated ocean management program created in ORS 197.415 (the Oregon Ocean Resources Management Act) that includes Statewide Planning Goal 19, Ocean Resources; the Territorial Sea Plan; and the Ocean Policy Advisory Council.

Recommendations to the Governor

Overall Recommendation

The Ocean Policy Advisory Council RECOMMENDS that

a. Oregon establish a limited system of marine reserves in order to test and evaluate their effectiveness in meeting marine resource conservation objectives; and

b. before designating any specific marine reserves, Oregon must acquire additional information and conduct additional study, analysis, and deliberation through an open, public process with extensive stakeholder involvement. This process is described below.

The Ocean Policy Advisory Council makes NO recommendation for either a specific system of reserves or area locations at this time. The OPAC recommends that decisions about such a system or specific reserves be the result of the proposed public process.

The OPAC recommends that attention be devoted to the Rocky Shores Management Strategy in the Territorial Sea Plan and the areas currently defined there. The Rocky Shores Management Strategy identifies and defines levels of protection currently assigned to specific rocky shore and island areas.

The OPAC makes NO recommendation about the use of marine reserves for fishery management. The OPAC concurs that this determination is the purview of state and federal fishery management agencies. However, because the OPAC understands that its recommendation could result in reserves with the potential to affect fisheries activities or fisheries management, an open, public process with extensive stakeholder involvement is essential to anticipate and maximize beneficial effects while minimizing negative effects.

Goals and Objectives for Planning and Evaluation

For the planning and evaluation process, the Ocean Policy Advisory Council RECOMMENDS the following goal and objectives for the system of marine reserves:

System Goal: to help Oregon to meet the conservation objectives of Statewide Planning Goal 19, Ocean Resources. These conservation objectives include maintaining the long-term benefits of renewable marine resources and protecting marine biodiversity, important marine habitats, and areas important to marine fisheries.

System Objectives:

- to establish ecological reference areas as part of an integrated management strategy in significant rocky shore and marine habitats in the territorial sea and on the continental shelf;
- to test the effectiveness of these reserves in maintaining and restoring ecological integrity;
- to provide a strategic framework for appropriate research funding; and
- to increase understanding and awareness of Oregon's marine resources.

The OPAC RECOMMENDS that specific long-term goals and objectives for each reserve be developed during the planning and evaluation process, below.

Two-Phase Process for Planning and Implementation

The Ocean Policy Advisory Council RECOMMENDS the following process for ensuring that all stakeholders are involved in all phases of planning, implementation, and evaluation of the system of reserves. The OPAC also RECOMMENDS that Oregon provide core funding for this process to enable the state to leverage additional funding from other sources.

Phase One: Coastwide Framework Planning and Assessments

A reserve planning committee would be formed with membership representing affected and interested parties such as commercial and recreational fishermen, other ocean users, coastal communities, coastal tribes, state management agencies, marine scientists, state resource managers, conservation interest groups, interested or knowledgeable citizens, and the general public. The Ocean Policy Advisory Council would supervise this reserve planning committee and give final approval to the committee's recommendations.

A scientific advisory committee comprised of marine scientists and technical experts would be convened to support the work of the reserve planning committee and the OPAC.

As part of this process, focus on the Rocky Shores Management Strategy will be supported by staff from the Oregon Parks and Recreation Department in partnership with the Department of Land Conservation and Development, Department of Fish and Wildlife, and the Oregon Division of State Lands.

A adequate planning period is required in order to gather needed information, agree on goals, plan, and assess a feasible, practical experimental system of marine reserves based on clear research and other conservation objectives related to Goal 19. The OPAC intends that before approval of a coastwide system, the potential ecological, economic, and other costs and benefits of various alternatives will be analyzed.

Experience elsewhere with the planning, designation, and implementation of marine reserves has demonstrated that collaborative, participatory goal-setting and planning is essential to increase the likelihood of acceptance and functional success of reserves in meeting program objectives.

Phase Two: Local Area Planning and Implementation

After the coastwide framework plan is completed, the OPAC intends that it be carried out through additional public process at the local level, involving stakeholder, interested groups and individuals, scientists, and resource experts. The number and location of local area planning processes will be determined in large part by Phase One, the coastwide planning and evaluation process, ecological boundaries, and by the resources available to the OPAC and participating agencies. The OPAC recognizes that each local process will require sufficient time and resources to engage all interested stakeholders, address local needs, take advantage of local knowledge, and build local capacity, and that a definitive timeline is not now possible

Area Identification and Planning

Although some reserve areas may be identified in the coastwide framework plan, the exact location, shape, and size of reserve areas will depend many local factors such as fishing patterns, location of habitats, social or economic uses of the area, research opportunities, local current patterns, etc. that are best analyzed and accommodated at a local level. A reserve plan would be

prepared for each reserve through a locally-oriented process, containing such elements as baseline resource information, specific goals and objectives, research needs, monitoring criteria, enforcement needs, and funding needs. No reserve area would be implemented prior to an assessment of the potential ecologic, economic, and social costs and benefits of that reserve.

Implementation

Several potential methods could be used individually or in combination to implement reserves in state waters, depending on the location, size, specific objectives, local interest, etc., including:

- local community-based organizations that have knowledge of and clear interests in the reserve area and the success of experimental design;
- state programs and regulations in agencies such as Oregon Department of Fish and Wildlife, Oregon Parks and Recreation Department, Division of State Lands, Oregon Natural Heritage Advisory Committee, Department of Environmental Quality, Oregon State Police Fish and Game Division, and State Marine Board; and
- federal agency programs or regulations, especially with regard to the National Wildlife Refuge rocks and island, designation of Essential Fish Habitat under the Magnuson-Stevens Marine Fisheries Conservation Act, and research programs for marine resources and marine reserves in the National Oceanic and Atmospheric Administration and other agencies.
- action by the Oregon legislature

For federal waters, the OPAC recognizes that the state has no authority to implement or impose any reserves beyond state waters but urges federal agencies to carry out similar public processes with state, local, and stakeholder involvement when considering marine reserves in ocean areas under federal control off the Oregon.

Stakeholders:

The OPAC intends a broad interpretation of the term "stakeholder" to include all affected or interested parties, groups and individuals because all have important contributions to make in carrying out this proposal. An open, participatory, step-wise planning and evaluation process will enable all interested parties to be involved in all phases of this process. This approach is not only consistent with Oregon's goal of citizen involvement in planning, but consistent with experience elsewhere in the world, where marine reserves have been proven beneficial to both ecosystems and the local economy.

Guidelines for planning marine reserves

- Decisions about marine reserve placement will consider social, economic, and ecosystem effects using the best and most current biologic, economic, and social science information.
- The size and number of reserves will be limited to the minimum needed to achieve the specific objectives for reserves.
- Clear goals and criteria will be developed for each reserve to be used on a regular basis (e.g. annual, every five or ten years, etc.) to assess performance and to adjust or terminate sites as appropriate. Goals would address purposes, benefits, evaluation, enforcement and other issues.

- No reserve will be implemented prior to an assessment of the potential ecologic, economic, and social costs and benefits of that reserve. Such assessments will be the basis for potential mitigation.
- Marine reserves will be designated for specific terms based upon several factors including location, size, purpose, biologic expectations, ocean conditions, etc. It is anticipated that reserves will be periodically evaluated to meet local and coastwide objectives. A term of up to twenty-five (25) years is suggested as a time at which the reserve would be thoroughly reviewed and assessed for effectiveness in meeting its specific and coastwide objectives and to account for benefits, both planned and unanticipated, from the designation. A decision to continue the reserve would be made by OPAC after review with input and advice from a scientific advisory panel and from public comments.
- The coastwide framework plan and subsequent local reserve plans will include potential measures to mitigate for identified effects on fishermen and other ocean users, including coastal tribes.
- During the coastwide framework plan process, Oregon will seek funding to conduct baseline inventories, research, and monitoring to obtain information for decision-making, and as a basis for the measurement of performance against the reserves system objectives.
- A realistic funding plan will be developed as part of the management plan for each marine reserve prior to implementation. In addition, Oregon, through the Ocean Policy Advisory Council, will prepare a long-term marine research plan and funding strategy from which to develop funding proposals as needs and opportunities arise.
- Local marine reserve implementation plans will identify workable enforcement measures based on local conditions and the goals and objectives of the reserve.
- The state will aggressively seek a variety of funding partners, local, state, federal, and private to assure the necessary research, monitoring, enforcement, and mitigation.

Appendix:

Selected Bibliography:

MARINE PROTECTED AREAS and MARINE RESERVES

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Alder, J., D. Zeller, T. Pitcher, and R. Sumaila. 2002. "A Method for Evaluating Marine Protected Area Management". *Coastal Management*. Vol. 30. 121-131.

Allison, G.W., J. Lubchenco, and M.H. Carr. 1998. "Marine Reserves are Necessary but not Sufficient for Marine Conservation". *Ecological Applications*. Vol. 8. Suppl. 1: S79-S92.

Anderson, L. 2000. "Marine Reserves in Oregon: Analysis of Industry Perceptions and Strategies for Improved Communications. Prepared for Environmental Defense. Oakland CA. Presented at Oregon Ocean Policy Advisory Council meeting April 2001.

The Design and Monitoring of Marine Reserves. 1997. Results of a workshop sponsored by the Fisheries Centre at the University of British Columbia. T. Pitcher, ed. FCRR 1997, Vol. 5(1). 49 pp.

Fujita, R. 2000. "Marine Reserves: A Summary of the Scientific Literature". Environmental Defense, Oakland, CA. Presented at Oregon Ocean Policy Advisory Council Symposium on Marine Protected Areas, October 2000.

Grader, Z., and G. Spain. 1999. "Marine Reserves: Friend or Foe?". Fishermen's News. Pacific Coast Federation of Fishermen's Associations. San Francisco. http://www/pcffa.org/fn-feb99.htm Presented as part of testimony Dialogue with Experts, Oregon Ocean Policy Advisory Council, January 2002.

Halpern, B. 2002 (in press, *Ecological Applications*). "The impact of marine reserves: do reserves work and does reserve size matter?". University of California, Santa Barbara.

Hanna, S. 2000. "Marine Protected Areas: Economic Issues". Talking notes presented at Marine Protected Areas Symposium, Oregon Ocean Policy Advisory Council. October 2000.

Hoobyar, P., and H. Weeks. 2000. "Marine Reserves: Will Protecting Ocean Habitats Make a Difference?". *Restoration* (ISSN 1521-5261). Oregon Sea Grant. Spring 2000.

Johnson, D.A., N.A. Funicelli, and J.A. Bohnsack. 1999. "Effectiveness of an Existing Estuarine No-Take Fish Sanctuary within the Kennedy Space Center, Florida". *North American Journal of Fisheries Management*. Vol. 19. 436-453.

Love, M.S., P. Morris, M. McCrae, and R. Collins. 1990. Life History Aspects of 19 Rockfish Species (Scorpaenidae: *Sebastes*) from the Southern California Bight. NOAA Technical Report NMFS 87.

Kenchington, R.A. 1990. Managing Marine Environments. Taylor and Francis New York. 248 pp.

Didier, A.J. 1998. Marine Protected Areas of Washington, Oregon, and California. Pacific States Marine Fisheries Commission. Gladstone, Oregon. 71 pp.

Marine protected areas: tools for sustaining ocean ecosystems. 2001. Committee on the Evaluation, Design and Monitoring of Marine Reserves and Protected Areas in the United States--National Research Council, Ocean Studies Board. Washington, D.C.: National Academy Press. 272 pp.

MontaZo, G. 2002. "Reconstructing Community Interactions in Sea Urchins Reserves". Ph.D. Thesis, Oregon State University, Corvallis.

Murawski, S.A., R. Brown, H.-L. Lai, P.J. Rago, and L. Hendrickson. 2000. "Large-Scale Closed Areas as a Fishery-Management Tool in Temperate Marine Systems: The Georges Bank Experience". *Bulletin of Marine Science*. Vol. 66. No 3. 775-798.

Murphy, Michael. 2000. "Are Marine Reserves a Panacea for Protecting Coastal Resources: Socioeconomic Issues Affecting Implementation and Management". Presented at The Coastal Society 2000, Portland Oregon.

Murray, S.N., R.F. Ambrose, J.A. Bohnsack, L.W. Botsford, M.H. Carr, G.E. Davis, P.K. Dayton, D. Gotshall, D.R. Gunderson, M.A. Hixon, J. Lubchenco, M. Mangel, A. MacCall, D.A. McArdle, J.C. Ogden, J. Roughgarden, R.M. Starr, M. J. Tegner, M.M. Yoklavich. 1999. "No-take Reserve Networks: Sustaining Fishery Populations and Marine Ecosystems". *Fisheries*. Vol. 24, No. 11. 11-25.

Paddack, M.J. 1996. "The influence of marine reserves upon rockfish populations in central California kelp forests". M.S. Thesis, University of California, Santa Cruz.

Paddack, M.J. and J.A. Estes. 2000. "Kelp Forest Fish Populations in Marine Reserves and Adjacent Exploited Areas of Central California". *Ecological Applications*. Vol. 10, No. 3: 855-870.

Palsson, W. A. 2001. "Marine refuges offer haven for Puget Sound fish". Fish and Wildlife Science. Online Science Magazine, April 2001. http://www.wa.gov/wdfw/science/current/marine_sanctuary.html

Palumbi, S.R. 2000 "The Ecology of Marine Protected Areas". Marine Community Ecology. M.D. Bertness, S. D. Gaines, and M.E. Hay, eds. Sinauer Associates, Inc, Sunderland, MA. pp. 509-530.

Parker, S.J., S.A. Berkeley, J.T. Golden, D.R. Gunderson, J. Heifetz, M.A. Hixon., R. Larson, B.M.Leaman, M.S. Love, J.A. Musick, V.M. O'Connel, S. Ralston, H.J. Weeks, and M.M. Yoklavich. 2000. "Management of Pacific Rockfish". *Fisheries*. Vol. 25, No. 3. 22-29.

Roberts, C.M., J.A. Bohnsack, F. Gell, J.P. Hawkins, R. Goodridge. 2001. "Effects of Marine Reserves on Adjacent Fisheries". *Science*. Vol. 294. 1920-1923.

Sanchirico, J.N., K.A. Cochran, and P.M. Emerson. 2002. "Marine Protected Areas: Economic and Social Implications". Environmental Defense. Online at http://www.environmentaldefense.org/pdf.cfm?ContentID=1535&FileName=MPAs%5Feco%5Fsocio%5Fimplic%2Epdf

Sustaining Marine Fisheries. 1998. Committee on Ecosystem Management for Sustainable Marine Fisheries, National Research Council, Ocean Studies Board. Washington, D.C.: National Academy Press. 164 pp.

Syms, C. and M.H. Carr. 2001. "Marine Protected Areas: Evaluating MPA effectiveness in an uncertain world." Presented at workshop of the North American Commission for Environmental Cooperation, Monterey, California, USA. http://www.biology.ucsc.edu/people/carr/Syms/syms_download_page.htm

Yoklavich, M. 1998. Marine Harvest Refugia of West Coast Rockfish: A Workshop. NOAA Technical Memorandum NOAA-TM-NMFS-SWFSC-255. 159 pages.