APPENDIX A: RESPONSES TO COMMENTS RAISED BY THE DEIS/MP
Responses to Comments Raised by the DEIS/MP
Introduction

This Appendix, Responses to Comments Raised by the DEIS/MP, summarizes the comments received on the Draft Environmental Impact Statement/Management Plan (DEIS/MP) prepared for the proposed Olympic Coast National Marine Sanctuary (OCNMS). This document also provides NOAA's responses to these comments in accordance with the National Environmental Policy Act (NEPA). NOAA's responses to comments are also provided via appropriate expansion, clarification, or revision of the DEIS/MP.

The Sanctuaries and Reserves Division (SRD) received 666 written comments during the comment period from September 20, and November 27, 1991 from individuals, organizations, business/industry and local, tribal, state and Federal government. In addition, 137 statements were presented at six public hearings that were held November 6-20, 1991.

These comments contributed to the evolution of NOAA's policies concerning the proposed Sanctuary. This volume clarifies the issues expressed by the commenters, and presents NOAA's final position on actions necessary for the long-term protection of the resources and qualities of the OCNMS.

All letters, documents, and scientific papers were read and divided into five categories: individuals, government, organizations, business/industry, and public hearing transcripts. Each comment was carefully analyzed and grouped into one of twelve issues. NOAA's response is printed following each comment.

Table 1 is a matrix that reflects issues raised by government officials and agencies, organizations, and business/industry. An X is placed next to the commenter's name or group for each issue they commented on.

Individuals who commented on the DEIS/MP and are not reflected in Table 1 are listed in Table 9. Copies of all written comments and public hearing transcripts are available for review during normal business hours at:

Jefferson County Library
P.O. Box 990
Port Hadlock, WA
(206) 385-6544

North Olympic Library System
207 S. Lincoln
Port Angeles, WA
(206) 452-9253
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**List of Acronyms**

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<thead>
<tr>
<th>Acronym</th>
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<tr>
<td>APA</td>
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<td>ATBA</td>
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<td>BIA</td>
<td>Bureau of Indian Affairs</td>
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<td>Draft Environmental Impact Statement/Management Plan</td>
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<td>MARPOL</td>
<td>International Conference on Marine Pollution, 1973</td>
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ISSUE: BOUNDARIES
BOUNDARY ALTERNATIVE 1

Comment: NOAA should choose boundary alternative 1 because: 1) it contains most of the unique ecological features off the Washington Coast; 2) NOAA can offer greater protection to the coastal features than the resources further offshore in the event of a spill of hazardous materials; and 3) vessel traffic would be least affected, thereby ensuring safer seas.

Response: NOAA disagrees. Boundary alternative 1 contains most of the ecological features visible above the sea surface. However, a marine sanctuary should encompass a discrete ecological unit with definable boundaries (16 U.S.C. § 1433 (b)(1)(F)). The marine mammals and seabirds that transit the waters off the Olympic Peninsula and colonize the offshore rocks and islands forage in the rich waters and benthic communities over and on the continental shelf. The shelf is broad off the Strait of Juan de Fuca. The seaward extent of the shelf coupled with the upwelling produced from the Juan de Fuca Canyon are the physical parameters that support the food chain from the plankton to the marine mammals and seabirds. The offshore rocks and intertidal communities are only one habitat within the marine ecosystem off the Olympic Coast. Therefore, the marine sanctuary should encompass the ecologically significant offshore waters.

With respect to NOAA’s ability to protect the offshore waters in the event of a spill, NOAA agrees that there is little that can be done once a spill has occurred. The high seas would most likely render response capabilities ineffective. However, NOAA will coordinate with the U.S. Coast Guard, the Washington State Office of Marine Safety, and the coastal tribes to ensure that there is an adequate response capability for the coastal waters, intertidal regions, and beaches along the sanctuary including seabird and marine mammal rescue capabilities.

Extension of the Sanctuary boundary to the shelf edge provides a buffer area for protecting the coastal resources. NOAA is working with the U.S. Coast Guard to develop a proposal for an Area to be Avoided (ATBA) from the shoreward boundary to 25 nautical miles offshore of the Olympic Peninsula. This ATBA is designed to provide sufficient time to respond to a vessel that loses power off the Olympic Peninsula. The ATBA is compatible with many of the existing voluntarily adhered to traffic patterns along the coast and thus adds only minimal time and distance to transits between the Strait of Juan de Fuca and destinations to the south.
BOUNDARY ALTERNATIVE 2

Comment: NOAA should choose boundary alternative 2 as the preferred alternative.

Response: NOAA disagrees for the same reasons stated in response to the previous comment. The seaward extent of boundary alternative 2, which approximates the 50 fathom isobath, has no relation to the seaward extent of the coastal ecosystem.

BOUNDARY ALTERNATIVE 3

Comment: NOAA should choose boundary alternative 3 as the preferred alternative.

Response: Boundary Alternative 3 excludes the Juan de Fuca Canyon, which is one of the richest regions of the offshore oceanic ecosystem. It also excludes some of the highest concentrations of human uses which threaten the health of the marine ecosystem off the Olympic Peninsula.

Comment: NOAA should not choose boundary alternative 3 as the preferred alternative because it will be too restrictive for vessel traffic.

Response: NOAA is proposing no regulations that will unduly restrict vessel traffic. (See response to comment on boundary alternative 1).

BOUNDARY ALTERNATIVE 4

Comment: NOAA should select boundary alternative 4 as the preferred alternative because: 1) many of the unique unspoiled ecological resources that might be significantly impacted by oil are located in the physically complex area north of Pt. Grenville including areas of submarine canyons, productive fishing grounds, and coastal features that are critical habitat; 2) Sanctuary status in the southern portion of the study area would conflict with state managed activities such as dredged material disposal, while most of the shoreline in the north has little commercial activity; and 3) NOAA can enlarge the boundary in the future.

Response: NOAA agrees. One of the most valuable qualities of the Olympic Peninsula is that it is undeveloped and relatively pristine. NOAA recognizes that the southern portion of the boundary is much more developed, especially with respect to the harbor maintenance activities in Grays Harbor. Further, the rocky intertidal habitats in the north are much more sensitive to pollution from oil and gas compared to the sandy beach environments in the southern
portion of the study area. In the event of a spill of hazardous materials, experts predict that it would take years for intertidal communities of rocky intertidal environments to become reestablished, whereas it would take an order of months for the sandy intertidal communities to recolonize. Lastly, NOAA can expand Sanctuary boundary 4 in the future, in accordance with the requirements of the Marine Protection, Research, and Sanctuaries Act (MPRSA), the National Environmental Policy Act (NEPA), and the Administrative Procedure Act (APA), if deemed necessary.

Comment: NOAA should not choose boundary alternative 4 because: 1) it is not scientifically defensible for it fails to protect the important and environmentally delicate estuaries along the southern coast; 2) it would render ineffective NOAA’s resource monitoring and sanctuary enforcement mandates; and 3) it will be too restrictive for vessel traffic.

Response: The boundary of a marine sanctuary should approximate the most identifiable boundaries of a marine ecosystem. The Site Evaluation List (SEL), from which sites are selected for consideration as marine sanctuaries, identified the coastal offshore islands as the core of the proposed Olympic Coast National Marine Sanctuary (originally identified as the Western Washington Outer Coast). With this focus, NOAA has determined that the boundaries of the ecosystem are encompassed by boundary alternative 4. NOAA recognizes that the coastal estuaries are ecologically valuable and that many organisms that exist within, or transit through boundary alternative 4, depend on the estuaries. However, while the estuaries and outer coast are ecologically linked, the productivity of the two environments is a function of very distinct environmental processes.

NOAA believes that protection of the estuaries could be best achieved through possible inclusion of these areas in programs targeting estuarine management such as, the National Estuarine Research Reserve System, the National Estuary Program, or the Coastal Zone Management Program.

NOAA believes that the size of the sanctuary encompassed by boundary alternative 4 is manageable with respect to research and monitoring initiatives.

As discussed above, NOAA is working with the U.S. Coast Guard to develop a proposal for an ATBA off the northern Olympic Peninsula. It is designed to be as compatible with existing customary practices among mariners as possible. NOAA is not promulgating vessel traffic regulations with designation.
BOUNDARY ALTERNATIVE 5

Comment: NOAA should choose boundary alternative 5 because:
1) activities that are, or could occur, in the southern portion of the study area can affect the resources in the north; 2) the entire study area is ecologically connected; 3) the management needs are greatest in the south; 4) the sanctuary management regime would complement existing management initiatives (Willapa Bay watershed planning processes, Columbia and Snake River Salmon Recovery Planning, State National Heritage Plans); and 5) expansion of the Sanctuary boundary in the future will be too time-consuming.

Response: NOAA’s preferred boundary alternative is based on an ecologically identifiable boundary. The northern and southern portions of the study area are distinct with respect to their coastal and offshore ecology. NOAA can protect Sanctuary resources from outside activities through the prohibition on discharges outside the Sanctuary boundary that enter and injure Sanctuary resources. NOAA will be involved in planning activities that could potentially threaten Sanctuary resources outside its boundary. The boundary can be expanded in the future if needed.

Comment: NOAA should not choose boundary alternative 5 because it is not necessary to encompass the entire Washington coastline as a marine sanctuary, and it would eliminate any future development of the coastal areas.

Response: NOAA agrees. See response to previous comment.

Comment: A more detailed analysis of the impacts of sanctuary designation must be undertaken before seriously considering boundary alternative 5.

Response: NOAA has undertaken an extensive analysis of the uses and ecology of the southern portion of the study area and believes that the ecologically sensitive estuarine environments are adequately protected.

ALTERNATIVE BOUNDARY SUGGESTIONS

Comment: NOAA should establish a series of smaller site-specific areas surrounding unique marine resources, such as ocean waters immediately adjacent to already protected terrestrial ecosystems such as wildlife refuges and the Olympic National Park. This alternative would afford sanctuary status to marine resources while maintaining provisions for compatible ocean uses.
Response: NOAA disagrees. Smaller site-specific areas would not encompass an ecosystem for the reasons stated above. Further, designation of the marine sanctuary would allow for the continuation of pre-existing and compatible uses.

Comment: NOAA's analysis of the resources within the study area identified the southern portion as highly important in terms of wildlife and fishery values, particularly the areas in and surrounding Willapa Bay. NOAA should consider modifying boundary alternative 4 by adding a satellite site encompassing the estuarine environment and the offshore waters of Willapa Bay.

Response: NOAA's analysis confirmed that the estuarine areas in the southern portion of the study area are significant natural resources and that many of the resources utilize the waters off the northern coast as well. However, NOAA has determined that the estuarine ecosystems are distinct from the higher energy marine environment of the northern portion of the study area. In addition, the activities in, and adjacent to Grays Harbor are managed pursuant to an existing estuarine management plan promulgated pursuant to the Washington State Shorelands Management Act. The residents living in the watersheds of Willapa Bay are currently preparing an estuarine management plan.

Comment: NOAA should consider the creation of a north and south Olympic Coast National Marine Sanctuary with separate but coordinated management regimes.

Response: The Act requires the designation of one sanctuary on the Western Washington Outer Coast with the offshore Islands and coastal areas of the northern Olympic Peninsula as the core area of the sanctuary. In carrying out this mandate, NOAA examined the seaward, northerly, southerly, and easterly extent of the ecosystem that has as its core the intertidal communities of the outer coast.

Comment: The boundary of the Sanctuary should be modified as further cetacean information is available.

Response: NOAA can modify the boundary in the future, in accordance with the requirements of the MPRSA, the NEPA and the APA, as more information becomes available.

MODIFICATION OF THE WESTERN BOUNDARY

Comment: The outer boundary of the sanctuary should extend westward to a point that minimizes restrictions and needless re-routing of vessel traffic and harbor maintenance
activities at the opening of Grays Harbor. To accomplish this objective, the outer limit of the sanctuary should be set at a distance between 2 and 10 miles from shore.

Response: Sanctuary boundaries are not established based on vessel traffic routes, particularly because routes are subject to change. NOAA will work with existing regulatory agencies to minimize impacts. While vessel traffic is in the scope of sanctuary regulations, NOAA is not promulgating vessel traffic regulations at this time.

Comment: The outer boundary should be established at either the 100 or 500 fathom isobath.

Response: NOAA has established the boundary at the 100 fathom isobath because it is generally recognized to be the seaward extent of the continental shelf, the area where photosynthetic activity is greatest.

Comment: Clarify the rationale for establishing the western boundary of alternatives 4 and 5.

Response: See response to previous comment.

MODIFICATION OF THE SHORELINE BOUNDARY

Comment: The shoreline boundary should be established at the lower low water mark to preclude interference with carefully crafted beach management plans regulating beach traffic, razor clam harvests and emergency aircraft landings.

Response: The shoreline boundary of the Sanctuary is located at the higher high water line where adjacent to Federally-owned land (including the Olympic National Park and the U.S. Fish and Wildlife refuges) and the lower low line mark when adjacent to State-owned land. Thus, the boundary does not interfere with beach management plans. Razor clam harvests within the intertidal zone of the Sanctuary will be managed by existing authorities such as the Washington State Department of Natural Resources, the Quinault Indian Tribe, and the National Park Service. Emergency aircraft landings are permissible in the Sanctuary.

Comment: The shoreline boundary should cut across the mouths of all rivers, streams and estuaries because there are sufficient management plans in place providing protection of inland environments such as the Washington State Coastal Zone Management Program and the Grays Harbor Estuary Management Plan.
Response: The shoreline boundary of the Sanctuary has been modified to cut across the mouths of all rivers, streams and estuaries.

Comment: Clarify why the shoreward boundary distinguishes between adjacency to tribal and non-tribal lands.

Response: The Tribes have jurisdiction to the mean lower low water line and the Sanctuary program does not have the authority to claim jurisdiction over tribal land without the consent of the governing body of the tribes. Both the Tribes and the State have requested that the Sanctuary boundary not overlap with tribal and State lands. Therefore, the coastal boundary has been modified so that it is at mean lower low water when adjacent to tribal and State owned lands and at mean higher high water when adjacent to Federally owned lands.

Comment: Existing National Park Service standards, regulations, and policies must not be diminished as a result of dual designation as a National Park and National Marine Sanctuary. The majority of the intertidal areas of the Olympic National Park are Federally designated Wilderness Area and must be managed accordingly.

Response: The Sanctuary boundary overlaps with the boundary of the Olympic National Park. NOAA will not diminish the standards, regulations and policies currently applying to the intertidal areas of the Olympic National Park. The existing standards, regulations and policies of the intertidal areas will remain. NOAA will enhance the protection of these intertidal areas by working with the Coast Guard to ensure a safer vessel traffic environment, and the upland users of the watershed to monitor and minimize the impacts of non-point source pollution. Additionally, NOAA will support research and resource monitoring initiatives in the intertidal areas and may seek compensation for damages if an accident were to occur that injures Sanctuary resources.

INCLUSION OF THE STRAIT OF JUAN DE FUCA

Comment: The northeastern boundary of the sanctuary should extend further into the Strait of Juan de Fuca to either: 1) the Lyre River; 2) the Clallam County Marine Sanctuary at Salt Creek; 3) Low Point; 4) Crescent Bay/Agate Beach; or 5) Pillar Point. Omission of the Strait of Juan de Fuca from the Sanctuary excludes the head of the Juan de Fuca Canyon from the boundary of the Sanctuary, and thus represents a boundary not based upon an ecological rationale.

Response: NOAA has examined the resources of the Strait
of Juan de Fuca and the FEIS/MP has been revised accordingly. Sections III and IV (Alternatives, and Environmental Consequences) examine the benefits and consequences of various alternatives in the Strait of Juan de Fuca. NOAA believes that the existence of a functional biotic community characteristic of the marine environment extends into the Strait of Juan de Fuca to Observatory Point. Eastward of Observatory Point, the ecosystem is more characteristic of an estuarine environment.

Despite the ecological arguments that support inclusion of the Strait of Juan de Fuca in the Sanctuary boundary, NOAA does not believe that the public has had ample opportunity to analyze and comment on the proposal to add the Strait. Since the Strait of Juan de Fuca lies entirely in state waters, the Strait of Juan de Fuca cannot be included without the approval of the Governor of Washington State. However, NOAA will pursue expanding the boundary if supported by the State of Washington.

Comment: The boundary of the Sanctuary should be contiguous with that of the proposed Northwest Straits Sanctuary. A gap between these two proposed sanctuaries would cause confusion for commercial shipping and fishing interests and government managing agencies.

Response: At this time, the future and nature of the proposed Northwest Straits National Marine Sanctuary is uncertain and cannot serve as a deciding factor in the determination of the eastern boundary of the Olympic Coast National Marine Sanctuary. The boundary of the Olympic Coast National Marine Sanctuary must be determined based on ecological and human use factors. NOAA can modify the boundary in the future if it is deemed appropriate. NOAA will coordinate with existing managing agencies to ensure that the Olympic Coast National Marine Sanctuary and the proposed Northwest Straits National Marine Sanctuary do not unduly disrupt the management of vessel traffic and fishing.

Comment: The boundary of the Sanctuary should not encompass the waters of the Strait of Juan de Fuca because closely-monitored vessel traffic lanes already exist.

Response: The MPRSA encourages multiple uses of the Sanctuary as long as they are compatible with the resource protection goals of the Sanctuary. Clearly, the Coordinated Vessel Traffic System in the Strait of Juan de Fuca is in the best interest of the vessel traffic industry and the environment. NOAA would not interfere with the vessel traffic management regime in the Strait of Juan de Fuca if the Governor of the State of Washington supported inclusion of the Strait of Juan de Fuca in the Sanctuary boundary.
NORTHERN BOUNDARY

Comment: The northern boundary of the Sanctuary should be adjacent to the international border and include vessel traffic lanes to facilitate the establishment of a cooperative international sanctuary and coordinated vessel traffic management regime.

Response: The northern boundary is adjacent to the international boundary.

INCLUSION OF THE ESTUARIES

Comment: NOAA recognized both the high resource values of the estuaries and the high level of point source discharges. By including the estuaries in the boundary NOAA would be in a position to work with the Washington Department of Ecology (WDOE) to correct the sources of pollution.

Response: NOAA has been working with the Washington Department of Ecology to address pollution problems in the coastal estuaries. The Grays Harbor Estuary Management Plan was supported by funding provided pursuant to the Washington Shorelands Management Act. NOAA agrees that the estuaries are extremely valuable environments with high levels of point source discharges. However, NOAA believes that the estuaries are ecologically distinct from the offshore waters of the Olympic Peninsula, which is the core area of the Sanctuary. Inclusion in the National Estuarine Research Reserve System (NERRS) is a more appropriate management framework for NOAA involvement in estuarine management.

Comment: The estuaries should be excluded from the Sanctuary boundary because the Washington State Coastal Zone Management Program and the Grays Harbor Management Plan offer sufficient protection to the estuaries.

Response: NOAA agrees. The estuaries are excluded from the preferred boundary of the Sanctuary.

CONSIDERATION OF OTHER NATIONAL MARINE SANCTUARIES AND NATIONAL ESTUARINE RESEARCH RESERVES (NERRS)

Comment: Some commenters believed that NOAA should designate the estuaries as NERR’s if they are not included in the boundary of the Sanctuary because of their natural resource values. Other commenters believed that NERR status is inadequate since it does not include the marine environment. Clarification is needed on the specific elements of the NERRS: 1) the degree of protection that the NERRS would provide to Grays Harbor and Willapa Bay; 2) the process of designation; 3) timetable for designation; 4)
assurances that designation would occur; and 5) the degree of protection to the estuaries that would be provided in comparison to sanctuary status.

**Response:** The terms of designation as a NERR are determined between the State and NOAA. The process begins with the nomination of an estuary, or portion thereof, to NOAA for inclusion in the NERRS by the Governor of the State. The State holds scoping meetings in the region nominated for inclusion to solicit public input. The State then prepares a draft environmental impact statement and management plan (DEIS/MP) where boundary, management, and regulatory alternatives are assessed and a preferred alternative is decided upon. The DEIS/MP must demonstrate that the key core land and water areas are adequately protected by the state. Once the DEIS/MP is completed, public hearings are held in the region. After a comment period of one month, the State must produce a Final Environmental Impact Statement/Management Plan (FEIS/MP) incorporating the public comments. Once NOAA approves the FEIS/MP the Reserve is officially designated. The entire process requires approximately three years. Designation is contingent upon available funding.

**Comment:** NOAA should encourage sanctuary designations in Northern Puget Sound, Hood Canal, Southern Oregon and Northern California.

**Response:** NOAA is working with the State of Washington to study the feasibility of a sanctuary in Northern Puget Sound. New candidates for sanctuary status are selected from NOAA's SEL. Sites in Southern Oregon and Northern California are presently on the SEL.

**HARBOR EXCLUSION/INCLUSION**

**Comment:** How will sanctuary designation influence the disposal of dredge material from harbor maintenance and development activities that occur in the Port of La Push, the mouth of the Quilleute River, and Neah Bay?

**Response:** No dredge spoil disposal will be permitted within the Sanctuary. Harbors are excluded from the Sanctuary boundary. Therefore, maintenance and development activities can occur, but disposal of dredge material must be either on land or outside the boundary of the Sanctuary.

**GROWTH MANAGEMENT**

**Comment:** The Sanctuary should help to limit population growth.
Response: The sanctuary program has no control over population growth adjacent to the Sanctuary boundary. Rather, the program exists to ensure that human uses resulting from growth do not have a negative impact on Sanctuary resources.

Comment: Private land owners should not lose development rights to their land, nor should they have the value of their land significantly decreased by regulation without due compensation for that loss.

Response: NOAA is issuing no regulations that will diminish the development rights of private property owners.

OPPOSITION TO SANCTUARY DESIGNATION

Comment: The marine sanctuary should not be designated because: 1) it would shut down the fishing industry; 2) existing legislation and management regimes offer adequate protection; 3) potential industrial interests would be stifled because the sanctuary would over-regulate the local economy and its growth; 4) the ecological/aesthetic values of Washington’s coastline are not permanently threatened; 5) local airports in Aberdeen and Ocean Shores would close due to insurance problems; and 6) the Olympic National Park has too much control over the Olympic Peninsula already.

Response: The Sanctuary will not shut down the fishing industry. Fishing is not within the scope of Sanctuary regulation; the regulation of fishing would remain with existing management regimes. Further, the Sanctuary will ensure greater protection from risks due to oil, gas and mineral development and vessel traffic accidents.

NOAA disagrees that existing legislation offers adequate protection of the offshore resources. The threats from such things as vessel traffic, oil and gas development, sand and gravel mining and Navy practice bombing of Sea Lion Rock have not been addressed through a comprehensive management regime that recognizes the value and fragility of the marine ecosystem off the Olympic Peninsula. NOAA does not believe that the Sanctuary will over-regulate the local economy since the main source of income in the region is from tourism, fishing and timber production—none of which will be negatively affected by the Sanctuary. Tourism and fishing will likely benefit from Sanctuary status due to the increased protection of the marine environment.
ISSUE: ALTERATION OF/OR CONSTRUCTION ON THE SEABED

Comment: The regulation pertaining to alteration or construction of the seabed may be interpreted as prohibiting such activities as geologic research, the placement of current meters, sediment traps and similar research equipment, all of which might be necessary if environmental studies were to be conducted in the Mineral Management Service (MMS) Washington-Oregon planning area. To clarify the intent of this prohibition, "Government sponsored environmental studies" should be added in the second sentence of this section as one of the activities for which this prohibition does not apply.

Response: NOAA supports research within the Sanctuary. However, the prohibition on alteration of, or construction on the seabed applies to all research activities, including those conducted by governmental agencies. All research activities conducted within the Sanctuary that violate a Sanctuary regulation must be undertaken pursuant to a Sanctuary research permit to ensure that the impacts from the research are minimal and temporary.

Comment: The prohibition on the alteration of, or construction on the seabed should not interfere with current or future harbor maintenance or fishing activities including: 1) jetty and groin construction; 2) permitted dredging of channels and harbors; 3) the use of dredge spoils for underwater berm construction; 4) construction and improvement of boat launching and marine facilities adjacent to reservations; 5) the retrieval of fishing gear (including crab pots) and sunken vessels; 6) bottom trawling and scallop dredging; and 7) tribal fin and shellfish operations. NOAA needs to clarify the exemption of activities incidental to routine fishing and vessel operations. The exemptions for harbor maintenance and fishing activities should read: "attempting to alter the seabed for any purpose other than anchoring vessels, normal fishing operations to include commercial bottom trawling and crab pot recovery, and routine harbor maintenance."

Response: Ports and harbors are not included within the boundary of the Sanctuary. Further, there is the following exception to the alteration-of-the-seabed regulation: "Harbor maintenance in the areas necessarily associated with Federal Projects in existence on the effective date of Sanctuary designation, including dredging of entrance channels and repair, replacement or rehabilitation of breakwaters and jetties." The boundary of the Sanctuary adjacent to the Port of La Push is congruent with the Colreg lines at the mouth of the harbor. The boundary of the Sanctuary at Neah Bay forms an arc from Koitlah Point to the

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point of land on the opposite side of Neah Bay. The arc is contiguous with the outer coast of Waadah Island. The noted activities incidental to fishing have been exempted from the Sanctuary regulations.

**Comment:** NOAA should prohibit all dredging and removal of sand and gravel within the Sanctuary boundary.

**Response:** NOAA has prohibited all dredging and removal of sand and gravel within the Sanctuary boundary. These activities threaten the integrity of the benthic community and the food source of many fish, marine mammals and seabirds.

**Comment:** NOAA should not subject the exploration and development of offshore mineral activities to the same restrictions proposed for the exploration and development of Outer Continental Shelf (OCS) oil and gas.

**Response:** All of these activities injure the benthic communities in the Sanctuary and NOAA does not believe that there is cause for exceptions.

**Comment:** Clarify NOAA's policy on establishing artificial reefs within the Sanctuary.

**Response:** There are no artificial reefs in the Sanctuary as of the date of designation. The creation of new artificial reefs would be prohibited pursuant to the prohibition on alteration of, or construction on, the seabed.

**Comment:** NOAA should prohibit the construction of pipelines on the sea floor.

**Response:** The regulation prohibiting the alteration of, or construction on, the seabed would prohibit the construction of pipelines on the sea floor.
ISSUE: CULTURAL AND HISTORIC RESOURCES

Comment: NOAA should prohibit moving, injuring, or possessing historic resources within the Sanctuary.

Response: NOAA agrees that it is necessary to protect and manage historical and cultural resources within the Sanctuary boundary. NOAA has included a prohibition on moving, removing, possessing, injuring, or attempting to move, remove, or injure these resources, except as resulting incidentally from traditional fishing operations. If NOAA determines that fishing activities are resulting in injury to Sanctuary historic and cultural resources, NOAA may amend the Sanctuary regulations to abolish the exemption for these activities.

Comment: The proposed regulations dealing with cultural resources fail to preserve the tribes' ability to control access to, and removal of, their cultural heritage. Therefore, NOAA should add a new section 925.5(a)(8) prohibiting: "removal or attempted removal of any Indian cultural resource or artifact, or entry onto a significant cultural site designated by a tribal governing body with the concurrence of the Director, except with the express written consent of the governing body of the tribe or tribes to which such resource, artifact, or cultural site pertains." NOAA should pursue a cooperative agreement with the tribes to coordinate management of cultural artifacts of tribal significance.

Response: The MPRSA provides NOAA with the authority to control access to cultural artifacts within the Sanctuary thereby helping to ensure their preservation. Accordingly, anyone proposing to remove a cultural or historic resource must apply for and obtain a sanctuary permit from NOAA. NOAA acknowledges the interest of the coastal tribes to preserve their cultural heritage and, in particular, those cultural artifacts of tribal significance found within the Sanctuary. NOAA considers its objective of preserving the historical and cultural resources of the Sanctuary to be compatible with the coastal tribes' desire to preserve their cultural heritage. Therefore, NOAA has clarified in section 925.9(d) that "In deciding whether to issue a permit, the Director or designee may consider such factors as . . . the effect of the activity on adjacent Indian Tribes." NOAA will work on a cooperative agreement with the tribes and the State of Washington to clarify the process by which permits will be granted to conduct research or salvage operations on historical and cultural resources of tribal significance.

Comment: Current management of cultural resources is agreed upon between the Bureau of Indian Affairs (BIA) and the
tribes. The BIA supports the tribes in the management of their cultural resources.

Response: See response to previous comment.

Comment: The regulation as proposed in the DEIS/MP is duplicative of State law. There already exists state and Federal antiquities acts to protect coastal archeological and historical sites that occur on or near the median high tide boundary. The State archeologist already coordinates archeological matters.

Response: The MPRSA is not duplicative of existing laws protecting historical and cultural resources. The MPRSA is more comprehensive in that it provides enforcement authority, including civil penalties, for the destruction or injury of historical and cultural resources.

The Abandoned Shipwreck Act of 1987 gives states the title to certain abandoned shipwrecks in state waters. Under the MPRSA, NOAA has trustee responsibilities for abandoned shipwrecks and other historical and cultural resources within national marine sanctuaries, including those located in state waters, for the purpose of protecting them. NOAA will coordinate with State agencies to ensure that historical and cultural resources within the Sanctuary are protected, and that the policies affecting historical and cultural resources in State waters are consonant with the policies in the Federal waters of the Sanctuary.
ISSUE:  DISCHARGES

Ocean Dumping

Comment: NOAA should not prohibit the use of dredged material disposal sites off Grays Harbor, Willapa Bay, the Columbia River, or on the north jetty and breakwater of the Port of La Push.

Response: The Sanctuary boundary does not extend south of Copalis Beach and excludes ports and harbors. Therefore, the maintenance activities at La Push and the use of the dredge disposal sites south of the boundary is not prohibited.

Comment: No ocean dumping should be allowed in proximity to the major submarine canyons.

Response: The regulations prohibit ocean dumping within the Sanctuary, and outside the Sanctuary if the material enters and injures Sanctuary resources or qualities.

Point Source Discharges

Comment: Prohibit discharges of toxics, plastic, and municipal garbage and sewage into the marine environment.

Response: The dumping of municipal garbage, toxics and plastics is prohibited within the Sanctuary by Sanctuary regulations and by regulations promulgated pursuant to the Act to Prevent Pollution from Ships (33 U.S.C. §§ 1901 et seq.) and the Marine Plastic Pollution Research and Control Act of 1987, which implements Annex V of MARPOL 73/78 in the U.S. Point source discharges are allowed provided such discharge is certified by NOAA in accordance with section 925.10 or approved by NOAA in accordance with section 925.11. After expiration of current permits, discharges from municipal treatment plants will be subject to the review process of section 925.11. At a minimum, secondary treatment will be required.

Comment: Current regulations are adequate. NOAA has not proven that the proposed regulations will enhance the recreational or aesthetic appeal, and water quality.

Response: Current regulations do not protect the area from the cumulative impacts of various types of discharges, including: 1) some ocean dumping; 2) sewage receiving only primary treatment; and 3) non-point source discharges. NOAA's ocean disposal regulation offers protection to the offshore environment that does not otherwise exist. NOAA will work with existing tribal, State and Federal
authorities to ensure that the quality of the water and Sanctuary resources are maintained.

**Comment:** Clarify how discharges from drilling and production rigs may be addressed if oil and gas leasing were to occur in the future.

**Response:** The regulations prohibit oil and gas exploration, development, and production activities within the Sanctuary. NOAA will work with the Environmental Protection Agency (EPA) to ensure that best available technology is implemented on any drilling rigs located outside of the Sanctuary to ensure that no discharges enter and injure Sanctuary resources and qualities.

**Comment:** Depositing or discharging from any location within the Sanctuary or from beyond the Sanctuary should be prohibited.

**Response:** The mandate of the National Marine Sanctuary Program is to facilitate multiple uses that are compatible with resource protection. Depositing or discharging most materials within the boundary of the Sanctuary, or from beyond the boundary of the Sanctuary if such material subsequently enters the Sanctuary and injures Sanctuary resources or qualities is prohibited. NOAA will work with EPA, the Tribes and the State of Washington to maintain water quality. NOAA may require special terms and conditions, including (but not limited to) improved effluent quality, on EPA permits to ensure Sanctuary resources and qualities are protected.

**Non-Point Source Discharges**

**Comment:** NOAA should not require at a minimum secondary treatment and sometimes tertiary or more for non-point source pollution. It is virtually impossible to subject runoff to these levels of treatment.

**Response:** NOAA does not require such treatment for non-point source pollution. NOAA will monitor non-point source pollution and work with those living and working in the coastal watersheds to minimize runoff into the Sanctuary.

**Comment:** It should be stated that there is no intent to regulate forest practices by Sanctuary administrators. There is no research or evidence which would justify the statement made in the proposed DEIS that the "greatest source of non-point discharge is the forest." This statement needs clarification and tree farmers must be assured that they can continue to grow and harvest trees pursuant to Washington’s Forest Practices Act, one of the
most stringent in the country.

Response: NOAA’s Strategic Assessment Branch has analyzed existing watershed data from the National Coastal Pollutant Discharge Inventory to determine sources of runoff. Summaries of pollution discharges for total volumes of nitrogen, lead, and all suspended solids combined indicate that with the exception of suspended solids discharged by paper mills, the greatest source of sediments discharged into sanctuary waters is from natural forest runoff.

Despite this evidence, NOAA will not be directly regulating upland uses. However, NOAA will coordinate with the upland user groups, and managing agencies to minimize non-point source impacts on Sanctuary resources.

Comment: The suggestion that excessive erosion from clear cutting practices is the source of most non-point source pollution from forests supports the need for further study of this common practice and the issuance of more stringent controls due to the steep and unstable slopes and amount of rainfall.

Response: NOAA agrees and will conduct monitoring and research initiatives in coordination with those living and working in the watersheds to minimize the impacts from timbering activities.

Discharges Outside the Sanctuary

Comment: Clarify to what extent the "sphere of influence" of the discharge regulation extends, to what degree it may affect coastal communities including the Tribes, and who determines if injury to a Sanctuary resource has occurred. Would a community such as Ocean Shores or an Indian Tribe face increased water quality regulations or enforcement? Further, does the discharge prohibition apply to particulates that are discharged into the air from pulp mills and subsequently enter the Sanctuary and harm Sanctuary resources and qualities.

NOAA should not impose additional restrictions, beyond the existing requirements of the Federal Water Pollution Control Act (FWPAA), on the discharge of effluent and dredge spoils into marine waters. There is no evidence that additional restrictions on these activities are required to protect water quality in the proposed sanctuary.

Response: The MPSA protects Sanctuary resources and qualities (including water quality) from the impacts of discharges from within and outside the boundary of a
Sanctuary whether airborne or waterborne. NOAA is responsible for determining injury to Sanctuary resources. Discharges pursuant to existing permits may be continued subject to the certification requirements of section 925.10. New permits are subject to the review process of section 925.11. At a minimum, secondary treatment will be required for any treatment plants discharging directly into the Sanctuary. With respect to airborne or waterborne discharges outside the Sanctuary, NOAA may condition such permits only if it is established that the discharges are entering the Sanctuary and injuring Sanctuary resources or qualities. NOAA will work closely with all to ensure that no one is unduly burdened by permitting requirements related to discharges. NOAA will coordinate with the State's Air Quality Board and Department of Ecology to monitor air and water quality over and in the Sanctuary.

Application of Discharge Regulations to Vessel Traffic

Comment: The application of this regulation should prohibit organic and inorganic discharges from fishing vessels and submarines (including bilge), aircraft. The prohibition should apply to all naval operations.

Response: The Sanctuary regulations specify the fishing and vessel related activities exempted from the discharge prohibition (section 925.5(a)(2)(i)-(iv)). Discharges and deposits from vessels are prohibited except for specific discharges intended to provide for traditional fishing activities, such as fish wastes resulting from traditional fishing operations in the Sanctuary, and for allowed vessel operations in the Sanctuary, namely biodegradable effluent incidental to vessel use and generated by approved marine sanitation devices, water generated by routine vessel operations, and engine exhaust. Such discharges are determined to be of minimal threat to the Sanctuary and are important for the safe and effective functioning of fishing and other vessels. Other discharges from vessel operations are prohibited. If in the future NOAA determines that increased protection for Sanctuary resources and qualities from these exempted activities is warranted, the Sanctuary regulations could be revised.

Comment: Clarify acceptable and unacceptable discharges from fishing vessels.

Response: See response to previous comment.

Economic Impacts of Discharge Regulations

Comment: Banning the use of approved dredge disposal sites would impose severe economic impacts on marine navigation
and commerce, and ultimately to the coastal communities.

**Response:** The boundary of the Sanctuary does not encompass the approved dredge disposal sites off of Grays Harbor, Willapa Bay, and the Columbia River. However, no new dredge disposal sites may be located within the Sanctuary boundary.

**Comment:** NOAA must examine the economic impacts of the discharge regulations on existing industries. There are currently 72 identified dischargers in the study area. It is unclear if the proposed Sanctuary would impact the continued operation of the pulp mill’s NPDES permitted discharge near Grays Harbor.

**Response:** The Sanctuary’s boundary does not extend south of Copalis Beach. Therefore, the only discharge regulation that would apply to dischargers in Grays Harbor would be the prohibition on discharges from outside the boundary that subsequently enter and injure Sanctuary resources or qualities. NOAA will need to establish that effluents from pulp mills are injuring Sanctuary resources or qualities before it would impose terms and conditions on the pulp mill’s NPDES permit. If this situation were to occur, NOAA would work with the discharger, the State of Washington, and EPA to minimize the economic impacts of reducing the impacts.
ISSUE: OIL AND GAS DEVELOPMENT

Comment: NOAA's failure to offer as an alternative an outright, no conditions ban on hydrocarbon development within the Sanctuary is contrary to NEPA regulations, 40 CFR 1502.14 which states that the alternatives section is the heart of the environmental impact statement. NOAA should permanently ban oil and gas exploration, development, and production activities.

Response: Section 2207 of the Oceans Act of 1992 prohibits oil and gas exploration, development and production within the Sanctuary. The Sanctuary regulations repeat this prohibition.

Comment: NOAA should designate a buffer zone based on ocean currents and local seabed geography to prevent damage from external mineral operations.

Response: NOAA believes that the Sanctuary is large enough to buffer the sensitive canyon and coastal ecosystems from negative impacts of mineral development. Further, NOAA's authority to regulate discharges from outside the Sanctuary boundary that subsequently enter and injure Sanctuary resources or qualities provides additional protection over mineral activities.

Comment: NOAA should commit in the FEIS/MP and Record of Decision to the preparation of an EIS before lifting the prohibition.

Response: As previously discussed, the Oceans Act of 1992 prohibits oil and gas explorations, development and production within the Sanctuary. This prohibition may only be lifted by an Act of Congress.

Comment: The oil companies should be excluded from voicing an opinion regarding the Sanctuary because this privilege should be extended only to those who have spent time enjoying the State of Washington coastline.

Response: The Sanctuary program does not and cannot discriminate against any individual, agency, or interest group. All individuals have the right to voice an opinion.

Comment: Has NOAA come across any proposal for offshore wind generated power?

Response: NOAA is not aware of any proposal for offshore wind generated power.

Comment: The President's decision to postpone OCS
activities off the coasts of Washington and Oregon until after the year 2,000 should expire at that time unless affirmatively extended.

**Response:** Section 2207 of the Oceans Act of 1992 indefinitely bans oil and gas exploration, development and production within the boundary of the Sanctuary. This prohibitions could only be lifted by an Act of Congress.

**Contingency Plans**

**Comment:** The Sanctuary should establish a contingency plan in coordination with existing state and Federal contingency plans. Efforts should be made to coordinate with the State of Washington Departments of Wildlife, Fisheries, Ecology, and Natural Resources and pursue data sharing opportunities.

**Response:** The FEIS/MP identifies existing oil spill contingency plans and efforts in the State of Washington to cover the Strait of Juan de Fuca and Outer Coast. NOAA will coordinate closely with the existing agencies involved in contingency and emergency response planning, particularly the U.S. and Canadian Coast Guard and the State of Washington Office of Marine Safety (OMS). However, NOAA agrees that the Sanctuary requires its own contingency plan to ensure that resources are protected during events that threaten the environment. A prototype Sanctuary Contingency Plan is being tested at the Channel Islands National Marine Sanctuary. Once implementation experience has been gained, the plan will be adapted to other sites, including the Olympic Coast National Marine Sanctuary. To implement successfully an organized emergency response, NOAA will incorporate state and Federal legislation as well as local efforts into the Sanctuary Contingency Plan.

**Comment:** NOAA needs to provide for better oil spill response planning.

**Response:** NOAA is coordinating with the regional response committees of the OMS to ensure that the equipment is available to address an emergency that would threaten Sanctuary resources.

**Comment:** An Oil Spill Response Center should be sited in close proximity to the Sanctuary to address small spills north of Grays Harbor where there is currently a lack of oil spill response capability.

**Response:** NOAA is promoting this idea in its participation on the regional response subcommittee whose jurisdiction is the Strait of Juan de Fuca and the Outer Coast. However, priority will be placed on the stationing
of tugs and barges dedicated to emergency response.

Comment: The tribes should be properly funded to handle resource damage assessment as well as other activities where an oil spill could impact their subsistence and ceremonial harvest and cultural values.

Response: The reservations are not within the Sanctuary boundary. Therefore, the Sanctuary cannot dedicate funds to the Tribes for the purpose of damage assessment pursuant to a spill of hazardous materials.

Comment: NOAA should request that the oil industry’s Marine Spill Response Corporation station a tractor/tug response vessel at Neah Bay.

Response: NOAA has made the recommendation to the subcommittee on emergency response for the Strait of Juan de Fuca and the Outer Coast. NOAA is actively participating in formulating the recommendation to the State, and will coordinate with the Makah Tribe in their planning initiative to expand their marina to plan to accommodate a tug or emergency response vessel that is of appropriate size to service the Outer Coast and the Strait of Juan de Fuca.

Comment: NOAA should ensure that drills are conducted for the Clean Sound Cooperative with outside evaluation.

Response: NOAA intends to hire an operations manager immediately after designation to address issues related to vessel traffic and contingency planning. One of the priorities of this position will be to encourage the Coast Guard to focus on the Sanctuary during its emergency response drills.

Comment: NOAA should propose the examination of extending unlimited liability for spills to the shipping companies and the original firms providing the original source materials involved in the polluting activities.

Response: The MPRSA only provides NOAA with the authority to collect $100,000 per day for each violation pursuant to 16 U.S.C. 1437(c)(1), and damages to Sanctuary natural resources pursuant to 16 U.S.C. 1443.
ISSUE: NAVAL PRACTICE BOMBING OF SEALION ROCK

Comment: NOAA should prohibit, or at least condition, the Navy's practice bombing activities over Sealion Rock due to the impact on seabirds, depositing of metal objects in the Sanctuary, and because the military environment does not require such a sensitive area to be used for such purposes. At the very least, NOAA should prohibit the practice bombing during the breeding season. Section 7 consultations with the Department of Commerce and the Department of the Interior should not be construed as sufficient mitigation because these processes do not address impacts to non-endangered species.

Response: NOAA agrees that the Navy practice bombing of Sealion Rock is inconsistent with the goals of the Sanctuary program. Because the permit under which the Navy conducted its activities over Sealion Rock was rescinded by the Secretary of the Interior in August, 1993, NOAA may prohibit outright all bombing activities within the Sanctuary and has determined to do so. The regulation adopted by NOAA prohibits all practice bombing and provides that no exemption from the prohibition will be granted.

Comment: NOAA does not have the authority to prohibit or condition the Navy's activities.

Response: Because the Navy's authorization from the Secretary of Interior was rescinded, NOAA now has the authority to not only condition but also prohibit the Navy's practice bombing activities.

Comment: NOAA should place the Navy's bombing activities within the scope of regulation to allow future regulation if necessary. To not list military activities is in conflict with the primary goal of resource protection.

Response: NOAA has addressed Navy activities in section 925.5(d) of the regulations.

Comment: NOAA should investigate the history of the Navy's activities over Sealion Rock to determine if a grandfather clause is warranted.

Response: The history of the Navy's activities and the permit that authorized its activities has been outlined in the FEIS/MP. The Navy's authority to conduct practice bombing activities has been rescinded and thus consideration of a grandfather clause is irrelevant.

Comment: Clarify how Navy bombing of Sealion Rock at 200 feet is less disruptive than commercial overflights.
Response: NOAA does not assert that the Navy’s low flying activities are less disruptive than commercial or non-commercial overflights. NOAA’s differing regulations in the DEIS/MP applying to Navy and non-military overflights resulted from limitations placed on NOAA by the MPRSA with respect to terminating pre-existing leases and permits.
ISSUE: PROTECTION OF TREATY RIGHTS

Comment: NOAA's regulations do not formally recognize the Federal Government's trust responsibility to the coastal Tribes. The regulations contain no provision which formally requires the Director to consider and protect tribal interests when ruling on permit applications to conduct development activities within the Sanctuary. To address this issue, the following modifications to the section 925.8 should be made:

The Director . . . may issue a permit . . . to conduct an activity otherwise prohibited by section 925.5(a)(2)-(7), if the Director finds that the activity will: further research related to Sanctuary resources:

... or promote the welfare of any Indian Tribe adjacent to the Sanctuary. In deciding whether to issue a permit, the Director shall consider such factors as . . . the impacts of the activity on adjacent Indian Tribes. Where the issuance or denial of a permit is requested by the governing body of an Indian Tribe, the Director shall consider and protect the interests of the Tribe to the fullest extent practicable in keeping with the purposes of the Sanctuary and his or her fiduciary duties to the Tribe. . . .

Response: NOAA agrees that the designation of the Olympic Coast National Marine Sanctuary is subject to the Federal government's general fiduciary responsibility to the coastal tribes. However, it is also clear that the Federal government is not obligated to provide particular services or benefits, nor to undertake any specific fiduciary responsibilities in the absence of a specific provision in a treaty, agreement, executive order, or statute. See Havasupai Tribe v. U.S., 752 F. Supp. 1471 (D. Ariz 1990), citing, Vigil, 667 (D.C. Cir. 1980); Gila River Pima-Maricopa Indian Community, 427 F.2d 1194, 190 Ct. Cl. 790 (1970). With respect to this designation, there is no specific provision in the coastal Tribes' treaties or any agreement, executive order, or statute which requires NOAA to undertake any specific fiduciary responsibility on behalf of the coastal Tribes. Therefore, NOAA can fulfill its obligations to the coastal Tribes with respect to the designation by giving due consideration to their interests and concerns during the decision-making process.

NOAA agrees that its trust responsibilities to the Tribes requires that it consider Tribal interest when ruling on permit applications to conduct activities within the Sanctuary. However, this responsibility does not require
that NOAA base its decision solely on what is in the best interest of the coastal Tribes. Therefore, NOAA opposes the addition of "or promote the welfare of any Indian Tribe adjacent to the Sanctuary", but agrees to include "the effects of the activity on adjacent Indian Tribes ...."

As previously stated, NOAA agrees that it must consider the interests of the Tribes when issuing permits, and language to that effect has been included in the regulations.

**Comment:** NOAA's regulation prohibiting the taking of marine mammals and seabirds conflicts with treaty rights to fish and hunt marine mammals in tribal usual and accustomed fishing grounds.

**Response:** NOAA recognizes that, given the standard for abrogating treaty rights enunciated by the Supreme Court in *United States v. Dion*, 476 U.S. 734 (1985), the provisions of the MPRSA do not abrogate the coastal Tribes' treaty fishing and hunting rights. However, it is unclear whether Congress intended the MMPA and the Endangered Species Act (ESA) to abrogate these rights. Recently, the Makah Tribe has pursued clarification regarding the applicability of the Marine Mammal Protection Act (MMPA) and ESA to its treaty rights to hunt whales and seals. The issue is currently being examined by the Tribes and the National Marine Fisheries Service (NMFS). Given the concerns raised by the coastal Tribes, section 925.5(a)(6) has been revised to read as follows:

Taking any marine mammal, sea turtle, or seabird in or above the Sanctuary, except as authorized by the National Marine Fisheries Service or the United States Fish and Wildlife Service under the authority of the Marine Mammal Protection Act, as amended (MMPA), 16 U.S.C. 1361 et seq., the Endangered Species Act, as amended, (ESA), 16 U.S.C. 1531 et seq., and the Migratory Bird Treaty Act, as amended, (MBTA), 16 U.S.C. 703 et seq., or pursuant to any treaty with an Indian Tribe to which the United States is a party, provided that the treaty right is exercised in accordance with the MMPA, ESA, and MBTA.

The revised language recognizes the Makah Tribe's treaty right to hunt whales and seals. However, the regulation also requires that the right be exercised in accordance with the provisions of the MMPA, ESA, and MBTA. If the MMPA, ESA or MBTA is determined to abrogate or otherwise restrict the Tribe's exercise of its right to hunt whales and seals, then that determination shall apply to the Tribe's exercise of those rights within the boundary of the Sanctuary.
Comment: The regulations fail to preserve tribal control of their cultural heritage. NOAA should amend section 925.5(a)(8) to read as follows:

Removal or attempted removal of any Indian cultural resource or artifact, or entry onto a significant cultural site designated by a Tribal governing body with the concurrence of the Director, except with the express written consent of the governing body of the Tribe or Tribes to which such resource, artifact, or cultural site pertains.

Response: The MPRSA provides NOAA with the authority to control access to cultural or historical artifacts within the Sanctuary thereby helping to ensure their preservation. Accordingly, anyone proposing to remove a cultural or historical resource must apply for and obtain a Sanctuary permit from NOAA. NOAA also acknowledges the coastal Tribes' desire to preserve their cultural heritage and, in particular, those cultural artifacts of tribal significance found within the Sanctuary. NOAA considers its objective of preserving the historical and cultural resources of the Sanctuary to be compatible with the coastal Tribes' desire to preserve their cultural heritage. Therefore, prior to issuing a Sanctuary permit to excavate a cultural or historical artifact that is of tribal significance, NOAA will consult with the affected Tribe(s). This clarification has been added to section 925.9.

Comment: The regulation prohibiting overflights under 1,000 ft. except for valid law enforcement purposes conflicts with the treaty secured rights to access certain reservation lands such as Tatoosh Island and Ozette, which are only accessible by helicopter in the winter months, and to conduct aerial timber cruises and engage in helicopter logging on portions of the reservation abutting the Sanctuary. Therefore the following amendment to section 925.5(7) is proposed:

Flying motorized aircraft at less than 1,000 feet above the Sanctuary within one nautical mile of the coastal boundary of the Sanctuary and the Flattery Rocks, Quilleute Needles, and Copalis National Wildlife Refuges, except for valid law enforcement purposes or where authorized by a governing body of an Indian Tribe to provide access to reservation lands.

Response: NOAA acknowledges the Tribes' concerns and does not intend to interfere with tribal rights to access reservation lands. Also, for the reasons discussed below, the minimum altitude has been changed to 2000 ft. In order not to interfere with Tribal access to reservation lands,
the prohibition on flying has been changed to read:

Flying motorized aircraft at less than 2,000 feet above the Sanctuary within one nautical mile of the Flattery Rocks, Quillayute Needles, or Copalis National Wildlife Refuge, and within one nautical mile seaward from the coastal boundary of the Sanctuary, except as necessary for valid law enforcement purposes, for activities related to tribal timber operations conducted on reservation lands, or to transport persons or supplies to or from reservation lands as authorized by a governing body of an Indian Tribe.

Comment: NOAA should apply the management plan equally to tribal and non-tribal governmental entities within the adopted boundary equally.

Response: NOAA is legally bound to recognize treaty secured rights and has no intention to interfere with these rights. As such, there will be circumstances in which Sanctuary regulations will apply to tribal and non-tribal members differently.
ISSUE: VESSEL TRAFFIC

Comment: Route tankers and barges as far away from near-shore reefs and islands as possible. Clarify what types of vessels can transit close to shore.

Response: There exists a Cooperative Vessel Traffic Management System (CVTMS) established and jointly managed by the United States and Canada. The CVTMS is a mandatory regime and consists of all navigable waters of the Strait of Juan de Fuca and its offshore approaches, southern Georgia Strait, the Gulf and San Juan Archipelagos, Rosario Strait, Boundary Pass, Haro Strait, and Puget Sound, bounded on the west by longitude 147°W and latitude 48°N, and on the northeast by a line along 49°N from Vancouver Island to Semiamoo Bay.

The rules of the CVTMS are intended to enhance safe and expeditious vessel traffic movement, to prevent groundings and collisions, and to minimize the risk of property damage and pollution to the marine environment. The rules apply to:

a. Each vessel of 30 meters or more in length; and
b. Each vessel that is engaged in towing alongside or astern, or in pushing ahead, one or more objects, other than fishing gear, where:
   (1) the combined length of the vessel towing, the towing apparatus, and the vessel or object towed is 45 meters or more; or
   (2) the vessel or object towed is 20 meters or more in overall length.

Both the Canadian and the United States Coast Guards are studying methods to improve the CVTMS in the area. Items being studied include replacement of outdated equipment, elimination of gaps in coverage, and increasing operator training and assignment length.

The Oil Pollution Act of 1990 (OPA 90) requires the U.S. Coast Guard to conduct a national Tanker Free Zone Study. This study is nearing completion and will recommend regulations requiring tank vessels to remain offshore during coastal transits.

Further, NOAA has recommended to the U.S. Coast Guard that an International Maritime Organization (IMO) approved ATBA be established within the proposed Sanctuary boundary. This would require vessels transporting hazardous materials to remain at least 25 nautical miles offshore while in the vicinity of Sanctuary waters or until making their approach to the Strait of Juan de Fuca using the established CVTMS traffic separation scheme. Although ATBA’s are not
compulsory for foreign flag vessels, a maritime state may make such an area compulsory for domestic vessels transiting the waters under its jurisdiction.

**Comment:** Clarify "commercial vessel" and distinguish between various sizes, uses, and types of vessels.

**Response:** "Commercial vessel" means any vessel operating in return for payment or other type of compensation. Clarification between sizes, uses, and types of vessels would require more space than is available in this document. Rather than attempt to hold to a general definition of "commercial vessel", reference will be made to specific types of vessels, i.e., tank vessels, bulk carriers, fishing vessels, pleasure craft, etc., wherever required.

**Comment:** The Sanctuary boundary should be published on navigational charts.

**Response:** NOAA agrees and will submit the Sanctuary boundary to the Nautical Charting Division of the National Ocean Service. The boundary will be delineated on the next update of the appropriate navigational chart.

**Comment:** Spill containment and cleanup measures should be part of appropriate mitigation requirements for vessels operating within the Sanctuary.

**Response:** OPA 90 mandates that tank vessel contingency plans be prepared for a worst-case discharge, and that vessel plans be reviewed and approved by the U.S. Coast Guard. OPA 90 also stipulates that each responsible party for a vessel from which oil is discharged, or which poses the substantial threat of a discharge of oil into or upon the navigable waters or adjoining shorelines or the exclusive economic zone, is liable for the removal costs and damages resulting from such an incident.

Further, Washington State law (Title 88 Section 46 Revised Code of Washington) requires the owner or operator of a tank vessel to prepare and submit an oil spill prevention plan prior to the vessel's entry into a Washington port. The law also requires that each tank vessel, cargo vessel of greater than three hundred or more gross tons, or passenger vessel of greater than three hundred or more gross tons have a contingency plan for the containment and cleanup of oil spills from such vessel into the waters of the State.

**Comment:** NOAA should provide a more complete explanation of how implementation of each of the regulations would put U.S.
shipping companies at an economic disadvantage in relation to foreign vessels. Precisely what would be the estimated cost in dollars, time, inconvenience, and ultimate impact upon U.S. shipping companies.

**Response:** NOAA is promulgating no regulations that will adversely affect domestic vessels.

**Comment:** NOAA should put forth a vessel traffic management plan, spearheaded by the U.S. Coast Guard, that addresses research needs, vessel traffic monitoring and communication systems, and future regulatory alternatives. The management plan should be proactive, and establish a timetable for considering new vessel traffic regulations in the future.

**Response:** NOAA is working with the U.S. Coast Guard, which has the primary authority for vessel traffic regulation, to determine the need for additional measures to ensure protection of Sanctuary resources and qualities. In addition, NOAA will work with the U.S. Army Corps of Engineers (COE) and the EPA regarding vessel traffic activities resulting from the transport of dredged material through the Sanctuary for disposal outside the Sanctuary. These consultations will aim to determine which resources are most at risk, which vessel traffic practices are most threatening, and which regulations or restrictions would be most appropriate to alleviate such risk.

NOAA agrees that an improved vessel traffic monitoring and communication system along the coast is desirable. OPA 90 requires the Secretary of Transportation to complete a comprehensive study on the impact of installation, expansion, or improvement of vessel traffic servicing systems. NOAA will work with the State of Washington's OMS, the U.S. Coast Guard, and appropriate public agencies during the development of these monitoring studies to determine an appropriate system for the Sanctuary and the need for any additional site-specific protective measures.

Vessel traffic monitoring and research and coordination on this subject have been incorporated into the Sanctuary management plan.

**Comment:** Allow only double-hulled vessels in the Sanctuary.

**Response:** OPA 90 establishes double hull requirements for tank vessels. Most tank vessels over 5,000 gross tons will be required to have double hulls by 2010. Vessels under 5,000 gross tons will be required to have a double hull or a double containment system by 2015. All newly constructed tankers must have a double hull (or double containment system if under 5,000 gross tons), while
existing vessels are phased out over a period of years.

As previously stated, the U.S. Coast Guard is completing a study of a tanker free zone where tank vessels would be required to remain offshore during coastal transits. Further, a proposal to establish an ATBA within the Sanctuary boundary has been developed and will be submitted to the International Maritime Organization (IMO) for approval at the earliest possible date which, in accordance with IMO’s procedures, is June, 1994. Both actions will serve to ensure that hazardous material laden vessels will remain an appropriate distance offshore.

Comment: Require vessels to have a pilot aboard.

Response: Requirements for pilots are set forth in both Federal and state regulations. NOAA will monitor and review vessel traffic in the Sanctuary and make recommendations to the appropriate regulatory agencies, state and Federal, regarding the need for additional pilotage requirements. Pilotage is currently compulsory for all vessels except those under enrollment or engaged exclusively in the coasting trade on the West Coast of the continental United States (including Alaska) and/or British Columbia. Port Angeles has been designated as the pilotage station for all vessels enroute to or from the sea.

OPA 90 requires the U.S. Coast Guard to designate U.S. waters where a second licensed officer must be on the bridge of a coastwise seagoing tanker over 1,600 gross tons. Under the Ports and Waterways Safety Act, the U.S. Coast Guard also is proposing to require a second officer on foreign flag tankers over 1,600 gross tons and on U.S. registered tankers over 1,600 gross tons.

Comment: Establish a tonnage limit within three nautical miles of shore except for those making a port call.

Response: All types of vessels and traffic patterns will be reviewed by NOAA, the U.S. Coast Guard, and the State of Washington OMS to determine any appropriate action to be taken. In conducting this review, attention will be paid to vessel type, cargo carried, and vessel size.

Comment: Require all vessels to have English speaking bridge personnel.

Response: All vessels required to participate in the Juan de Fuca region CVTMS are required to make all reports in English.

Comment: Curtail traffic during poor weather conditions.
Response: NOAA will work with the state, U.S. Coast Guard, and appropriate public agencies to determine the need for further vessel traffic regulations to specifically address vessel traffic during adverse weather conditions.

During conditions of vessel congestion, adverse weather, reduced visibility, or other hazardous circumstances in the area of the Juan de Fuca Region CVTMS, the Cooperative Vessel Traffic Management Center may issue directions to control and supervise traffic. They may also specify times when vessels may enter, move within or through, or depart from ports, harbors, or other waters of the CVTMS Zone.

Further, the U.S. Coast Guard's Navigation Rules, International and Inland, speak specifically to the conduct of vessels while at sea. Rule 6 of the International and Inland Steering and Sailing Rules states that "every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions."

Comment: Prohibit engine powered water craft of any type.

Response: A fundamental objective of the sanctuary program is "to facilitate, to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities" (16 U.S.C. 1431(b)(5)). NOAA will consider the threats from all types of vessels - power driven, sailing, or paddle propelled - as a continuing analysis of vessel traffic within the sanctuary boundaries.

Comment: Manage the off-loading or exchange of cargo or oil.

Response: No offloading or exchange of oil occurs within the boundary of the Sanctuary. This activity generally occurs in ports which are located outside of the Sanctuary boundary. Further, this type of activity is addressed by both OPA 90 and programs being established by the recently created Washington State OMS.

Comment: Prohibit shipment of reclaimed spent nuclear fuel from foreign reactors through the Sanctuary.

Response: As previously noted, NOAA has recommended to the U.S. Coast Guard that an IMO approved ATBA be established within the Sanctuary boundary. This would require vessels transporting hazardous materials to remain
at least 25 nautical miles offshore while in the vicinity of Sanctuaries waters or until making their approach to the Strait of Juan de Fuca using the established CVTMS traffic separation scheme.

NOAA will also work with the State of Washington’s OMS and both the U.S. and Canadian Coast Guards to be informed of, and alerted to, in a timely and regular manner, all hazardous cargo carriers transiting near Sanctuary waters. Further, through participation in regular meetings of the Washington State Regional Marine Safety Committees and discussions with the U. S. Coast Guard, NOAA will ensure that contingency plans adequately address such transport issues.

Comment: Prohibit commercial vessel anchorages within the Sanctuary, particularly off Makah Bay, except in emergencies.

Response: The use of the Makah Bay anchorage by vessels waiting either for an available pilot at Port Angeles or instructions from their home office, has been examined. Currently, its use as a temporary anchorage has been agreed upon by both the U.S. and Canadian Coast Guards. This is viewed as a more favorable alternative than having such vessels continuously underway within, and off the entrances to, the Strait. Vessels at anchor are subject to MARPOL, U.S. Federal law, and Sanctuary regulations regarding discharges. The use of this anchorage is monitored by Tofino Vessel Traffic Service which can also educate such vessels regarding the Sanctuary and its regulations.

Comment: Clarify NOAA’s authority to regulate vessel traffic within State of Washington waters.

Response: Section 303 of the MPRSA gives NOAA the authority to promulgate regulations to implement the designation, including regulations necessary to achieve resource protection.

Comment: The State and Federal government have appropriated $75 million to expand and enhance maritime activity at Grays Harbor through waterway dredging and port terminal development programs. If vessel traffic is restricted, one branch of the government would be defeating the purpose of other parts of the government.

Response: NOAA has studied vessel traffic along the Washington coast. The result of the analysis was the recommendation for the previously mentioned ATBA. This proposal, if adopted, would add approximately 17 nautical
miles on a transit from Grays Harbor to the entrance of the Straits of Juan de Fuca and approximately 21 nautical miles on a transit from the entrance of the Straits to Grays Harbor. In comparison to the costs of cleanup, legal fees, liability, fines, loss of cargo, and vessel and environmental damages, the proposals to establish the ATBA seem reasonable.

Comment: Double-hulled proposals are not economically sensible in the foreseeable future.

Response: Congress has mandated (OPA 90) national double hull requirements for tank vessels.
ISSUE: OVERFLIGHTS

Comment: Establish the boundary for overflights at the beach rather than one (1) mile inland.

Response: The boundary for overflights is at the shoreline and not one (1) mile inland.

Comment: Establish a 2,500 foot minimum flight altitude over the sanctuary.

Response: To be consonant with current regulations regarding flights over charted National Park Service Areas, U.S. Fish and Wildlife Service Areas, and U.S. Forest Service Areas, NOAA is prohibiting the flying of motorized aircraft at less than 2,000 feet above the Sanctuary within one nautical mile of the Flattery Rocks, Quillayute Needles, or Copalis National Wildlife Refuge, and at less than 2,000 feet above the Sanctuary within one nautical mile seaward from the coastal boundary of the Sanctuary, except as necessary for valid law enforcement purposes, for activities related to tribal timber operations conducted on reservation lands, or to transport persons or supplies to or from reservation lands as authorized by a governing body of an Indian Tribe. NOAA will work with the Federal Aviation Administration (FAA) to reflect this regulation on aeronautical charts.

Comment: Permit search and rescue at all times by whatever aircraft is needed to accomplish the task.

Response: The prohibitions set forth in the Sanctuary regulations do not apply to activities necessary to respond to emergencies threatening life, property, or the environment pursuant to Section 925.5 (c) of the regulations. Thus, in any emergency, search and rescue aircraft are allowed to perform whatever tasks are required within the Sanctuary boundary.

Comment: When necessary to bring a research flight into the area below the Sanctuary prescribed ceiling, regulations should require the plane’s engine be kept at or below a reasonable decibel level as heard from the ground.

Response: FAA regulations (14 CFR Part 36) codify noise standards for aircraft operating within U.S. airspace. Adherence to these standards is already required. When research is to be conducted within the Sanctuary boundary, aircraft operators will be required to obtain a permit and conduct such research in such a manner so as to minimize disturbance yet remain within safe aircraft operating parameters.
ISSUE: LIVING RESOURCE EXTRACTION

Fishing

Comment: NOAA should not restrict access to fishing grounds or catch-ability. Crab fishing and razor clam digging must be allowed.

Response: The regulation of fishing is not authorized by the Designation Document. NOAA has determined that existing fishery management authorities are adequate to address fishery resource issues. As with all other fisheries that occur within the Sanctuary, crab fishing and razor clam digging remain under the regulatory authority of existing Federal, state, tribal and regional fishery authorities. NOAA does not view fishing as contrary to the goals of the Sanctuary. The sanctuary program is by law mandated "to facilitate to the extent compatible with the primary objective of resource protection, all public and private uses of the resources . . ." (including fishing) (16 U.S.C. 1431(b)(5)).

Existing fishery management agencies are primarily concerned with the regulation and management of fish stocks for a healthy fishery. In contrast, the National Marine Sanctuary Program has a different and broader mandate under the MPRSA to protect all Sanctuary resources on an ecosystem-wide basis. Thus, while fishery agencies may be concerned about certain fishing efforts and techniques in relation to fish stock abundance and distribution, the Marine Sanctuary Program is also concerned about the potential incidental impacts of specific fishery techniques on all Sanctuary resources including benthic habitats or marine mammals as well as the role the target species plays in the health of the ecosystem. In the case of the Olympic Coast, fish resources are already extensively managed by existing authorities and NOAA does not envision a fishery management role for the Sanctuary Program. Accordingly, fishing activities have not been included in the list of activities in the Designation Document subject to regulation as part of the Sanctuary regime. However, the Sanctuary Program will provide research results and recommendations to existing fishery management agencies in order to enhance the protection of fishery and other resources within the Sanctuary.

Comment: No additional fisheries management or regulation is needed in the Sanctuary. Commercial, recreation, and subsistence fishing can be compatible with sanctuary designation, and the existing regulatory framework is adequate at this time.
Response: See response to previous comment. The Designation Document places kelp harvesting within the scope of future regulation since there is no existing management plan for kelp harvesting.

Comment: Clarify the language associated with commercial fishing practices near sunken vessels, rocks and reefs in the proposed sanctuary to insure continuance of historical and customary fishing practices. Existing Federal and state regulations adequately protect archeological treasures, man-made reefs, and natural rock and reef formations. The FEIS should acknowledge and permit prevailing practices.

Response: Commercial fishing vis-a-vis historical resources is an exempted activity under the prohibition against disturbance of historical resources. However, the exemption is only for incidental disturbance and therefore does not allow deliberate disturbance.

Comment: Fishing should either be regulated, or placed in the scope of regulation, because there may be a time in the future when fishing needs to be regulated by the Sanctuary.

Response: NOAA believes that existing authorities are adequate to regulate fishing. Should the need arise to regulate fishing as part of the Sanctuary management regime, the Designation Document could be amended.

Comment: Proposed regulations should result in the gradual reduction of fishing, aquaculture, kelp harvesting and waterfowl hunting to insure that no commercial activity threatens the integrity of any resources in the proposed Sanctuary. Some commenters believed that the Sanctuary should ban all commercial fishing activities except Native American fishing activities.

Response: A blanket reduction of resource-use activities across the Sanctuary could not be imposed without credible evidence that each resource affected is threatened by a population decrease or stock failure. Absent such evidence, the Act requires that existing uses be facilitated to the extent compatible with the primary objective of resource protection.

Comment: True refugia should be established where all consumptive uses are prohibited for a period of time.

Response: The determination of whether refugia are established in the Sanctuary will be done in coordination with the NMFS, PPMC, Washington Department of Fisheries (WDF), the tribes, environmental groups, and industry. The Sanctuary Advisory Committee (SAC) will be an important
forum to address this issue. If, in coordination with other governmental agencies, it is determined that establishment of refugia is a desirable alternative, NOAA will analyze the alternative through the preparation of an environmental impact statement/management plan and solicitation of public input pursuant to the NEPA and the APA.

Comment: Driftnets, trawling, and all dragnet fisheries should be banned from the proposed Sanctuary as inconsistent with the regulation prohibiting alteration of, or construction on, the seabed.

Response: The only net gear used in fisheries in the Sanctuary are trolling gear (for salmon) and trawling gear (for groundfish). The regulatory prohibition on altering the seabed includes an exception for incidental disturbance resulting from traditional fishing operations. NMFS has conducted a limited study of the impact of trawl gear on the benthos and has not identified any resulting systematic destruction. However, the regulations could be modified to regulate any activity that is shown to cause significant disturbance of the seabed. This reflects adherence to the MPRSA's goals of preserving natural and human-use qualities of a marine area.

High-seas driftnets, defined as nets greater than 1.5 miles long, have been banned pursuant to United Nations resolution 46/215. While gillnets and setnets are currently used in the inland waters of the State of Washington, they are not used in Sanctuary waters.

Comment: NOAA should facilitate the regulation of resource extraction within the Sanctuary under a regulatory framework that is controlled by a single agency.

Response: Regulatory authority over resources and resource extraction industries is expressly granted by state and Federal statute. NOAA does not have the primary regulatory authority over resource extraction. NOAA can act to coordinate the various regulators and can impose additional regulations, but cannot reassign itself or other agencies regulatory authority.

Comment: NOAA must clarify and acknowledge all tribal treaty fishing rights in the FEIS/MP, and the interaction of Sanctuary regulations with the right of tribes to fish in their Usual and Accustomed fishing areas.

Response: This issue is clarified in the Designation Document and in Part II (under Socio-Demographic profile and Land Use). Treaty rights to hunt and fish are acknowledged.
Comment: The entire study area must be considered as a "fishing area" since fish migrate along the entire Washington coast.

Response: NOAA recognizes that fish "know no boundaries in the sea." The fishing areas identified in the FEIS/MP only represent known locations where certain fishery activity is concentrated. The fishing areas displayed in the FEIS/MP are not related to regulatory jurisdiction in any way. They are simplified visual aids to complement the discussion of resources off the coast of Washington.

Aquaculture

Comment: Clarify NOAA's intention to regulate, condition, or prohibit aquaculture activities throughout the Sanctuary and adjacent to Indian reservations.

Response: The Sanctuary regulations do not directly prohibit aquaculture operations within the Sanctuary boundary. However, discharge of matter into the Sanctuary, or alteration of or construction on the seabed in connection with aquaculture activities are prohibited. It is unlikely that permits would be granted for aquaculture activities in the Sanctuary that violate these prohibitions. This determination is based upon U.S. Army Corps of Engineers (COE) guidance related to permits for fish pen mariculture operations, which prohibits fish farms in Federal natural resource areas, such as national seashores, wilderness areas, wildlife refuges, parks or other areas designated for similar purposes (e.g., national marine sanctuaries).

Comment: NOAA should change the proposed regulation governing alteration of or construction on the seabed to "maintenance and development of approved aquaculture operations", and strike "existing prior to the effective date of these regulations." Eliminating future aquaculture development off the Olympic Coast would preclude opportunities for both private shellfish and finfish production and for public enhancement. Technology is being developed which would result in minimal environmental imbalance, and would afford employment for regional communities.

Response: See response to previous comment.

Comment: The Sanctuary should not regulate aquaculture activities because there are sufficient regulations in place.

Response: See response to previous comment.
Comment: The Sanctuary should provide mutually agreed upon requirements for aquaculture activities among the oyster growers of Willapa Bay.

Response: The boundary of the Sanctuary does not include Willapa Bay.

Comment: The discussion in the FEIS/MP on the impacts of aquaculture needs to be expanded and the proposal to not regulate aquaculture in the Sanctuary should be re-assessed. The FEIS/MP needs to address the use of drugs in farm-raised fish.

Response: The discussion of aquaculture within the Sanctuary is intended only to evaluate the current status of the industry in the study area - it is not intended to measure aggregate impacts. The request for expanded discussion of resources does not identify specific issues of discussion. A re-assessment of aquaculture vis-a-vis the Sanctuary reveals that the industry is adequately regulated by existing state and Federal requirements. However, any discharges from such operations into the Sanctuary would be prohibited. The Sanctuary has no jurisdiction over the use of drugs in aquaculture - such determinations are under the purview of the Washington State Department of Health (WDH) and the Federal Food and Drug Administration (FDA).

Comment: All aquaculture should be banned from within the Sanctuary.

Response: The Sanctuary is required by law to facilitate public and private uses of Sanctuary resources as long as resource protection is not jeopardized. If properly sited and operated, aquaculture does not appear to appreciably impact the health of the marine environment.

Comment: Kelp harvesting should be banned or regulated within the Sanctuary.

Response: At present there is no kelp harvesting within the Sanctuary. The Washington Department of Natural Resources (DNR) is in the process of preparing a management plan for kelp harvesting. NOAA has included kelp harvesting in the scope of regulations in the Designation Document in the event that future action by NOAA is necessary to protect this resource. NOAA will work with DNR to develop a kelp management plan within the Sanctuary.
ISSUE: MARINE MAMMALS, SEA TURTLES AND SEABIRDS

Comment: Clarify "takings". The prohibition on the taking of marine mammals and seabirds within the Sanctuary is redundant with the ESA, the MMPA and the MBTA, and what further impact it will have on the fishing community.

Response: "Taking" is defined in section 925.3 of the regulations to mean: (1) for any marine mammal, sea turtle or seabird listed as either endangered or threatened pursuant to the ESA to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect or injure, or to attempt to engage in any such conduct and, (2) for any other marine mammal, sea turtle, or seabird, the term means to harass, hunt, capture, kill, collect or injure, or to attempt to engage in any such conduct. While marine mammals, seabirds and endangered and threatened species are protected under the MMPA, ESA and MBTA, NOAA believes that the higher penalties afforded under the MPRSA will provide a stronger deterrent.

The MBTA sets maximum criminal fines at either $500 or $2,000 per violation, depending on the violation. The MMPA sets maximum civil penalties at $10,000 and maximum criminal fines at $20,000. The ESA sets maximum civil penalties at $500, $12,000 or $25,000 per violation, depending on the violation; maximum criminal fines are set at $50,000. (All three statutes also provide for imprisonment for criminal violations.)

Section 307 of the MPRSA allows NOAA to assess civil penalties as high as $100,000 for each violation. In addition, monies collected under the MPRSA are available for use by the National Marine Sanctuary Program.

Comment: The MBTA would not allow any taking of migratory birds in the sanctuary, thus providing even stronger prohibition than sanctuary status can provide.

Response: See above response. Section 925.5(a)(6) of the Sanctuary regulations prohibits the taking of migratory birds within the Sanctuary. Including a prohibition on "taking" marine birds in the Sanctuary regulations allows such violations to be subject to the civil penalties authorized by the MPRSA which far exceed those authorized by the MBTA.

Comment: Prohibit all takings of marine mammals and seabirds, regardless of military or fishing exemptions.

Response: Section 925.5(a)(6) of the Sanctuary regulations prohibits the taking of marine mammals and
seabirds in or above the Sanctuary except as authorized by the NMFS or the United States Fish and Wildlife Service under the authority of the MMPA, as amended, 16 U.S.C. 1361 et seq., the ESA, as amended, 16 U.S.C. 1531 et seq., and the MBTA, as amended, 16 U.S.C. 703 et seq., or pursuant to any treaty with an Indian tribe to which the United States is a party, provided that the treaty right is exercised in accordance with the MMPA, ESA, and MBTA. Exemptions include a limited five-year incidental take of marine mammals provided by interim regulations promulgated pursuant to the MMPA, which are in effect until October, 1993. The ESA also has a limited incidental take exemption. See 16 U.S.C. section 1539(a)(2)(B(i). NMFS, in conjunction with environmental groups and the fishing industry, is developing a permanent management regime to be implemented upon expiration of the MMPA interim regulations.

If in the future NOAA determines that the existing regulations promulgated under MMPA, ESA, MBTA or any other state or Federal statute are not adequate to ensure the coordinated and comprehensive management of marine mammals and seabirds, changes to the Sanctuary regulations would be undertaken in accordance with the requirements of the MPRSA, NEPA and APA.

**Comment:** Exclude from [takings] prohibition birds considered game.

**Response:** The only birds section 925.5(a)(6) prohibits the taking of are seabirds--seabirds are not considered game species.

**Comment:** Section 925.5(a)(6) of the proposed regulations would prohibit the taking of marine mammals or seabirds unless affirmatively permitted by regulations promulgated under authority of the ESA, MMPA, or MBTA. Because these regulations do not expressly permit any takings by treaty Indians, the proposed sanctuary regulations would effectively prohibit the Makah Tribe from exercising their treaty rights to take marine mammals. The proposed regulations would also hinder the tribe’s ability to exercise its fishing rights by precluding fisheries which result in the incidental taking of marine mammals and seabirds.

The DEIS/MP offers no conservation justification for imposing restrictions on the taking of marine mammals and seabirds which go beyond the restrictions imposed by the ESA and MMPA. The DEIS/MP concedes that the purpose of the proposed sanctuary regulations is not to protect particular species from extinction. According to the DEIS the purpose of these additional prohibitions in the proposed regulations
is to "extend protection for sanctuary resources on an environmentally holistic basis." This goal does not permit infringement of treaty rights. Therefore, the regulations should be amended by adding "or in accordance with any treaty to which the United States is a party."

Response: The regulatory prohibitions do not abrogate or obstruct any rights under an existing treaty. The regulations have been changed by adding "or pursuant to any treaty with an Indian tribe to which the United States is a party, provided that the treaty right is exercised in accordance with the MMPA, ESA and MBTA." The treaty between the Makah Tribe and the United States explicitly assures the "right of taking fish and of whaling or sealing at usual accustomed grounds and stations." (Article 4, Treaty of Neah Bay, 1855).

Incidental takes of marine mammals can legally occur under permit and exemption provisions of the MMPA. Currently, Washington coastal tribes apply for and receive exemption certificates from NMFS for the incidental taking of marine mammals during fishing. Fees for this exemption are waived for tribes.

Further, tribes cannot be denied entry into any fishery based on the likelihood or occurrence of seabird or marine mammal takings. However, they could be prosecuted if they violate the ESA, MMPA, or MBTA.

Comment: Change the wording of the regulation to read "as authorized or permitted by NMFS or [the U.S. Fish and Wildlife Service] USFWS under the authority of the MMPA and ESA." NMFS suggests that the preamble and/or regulations clarify that Sanctuary permits will not be required for activities authorized or permitted by NMFS or USFWS under MMPA or ESA. Such clarification would relieve many concerns over the possibility of overlapping and potentially duplicative permitting requirements.

ISSUE: SANCTUARY ADMINISTRATION

Regulations/Permits

Comment: NOAA should use economic incentives rather than regulations to ensure that activities do not impact resources.

Response: NOAA does not have sufficient authority to provide economic incentives to ensure that activities do not impact Sanctuary resources. Even regulations, which include economic disincentives such as monetary penalties, are not sufficient to ensure that any activity does not impact resources.

Comment: Clarify the statement: "When a conflict with a sanctuary regulation related to specific [non-sanctuary] regulations occurs, the one more protective of sanctuary resources will prevail." NOAA regulations should not override those of the local jurisdictions. NOAA needs to clarify: 1) the application of this policy to fishing; 2) types of conflicts the statement applies to; 3) who determines whether a conflict exists; and 4) the process for resolving a conflict.

Response: NOAA agrees that the statement as written in the DEIS/MP is unclear. Accordingly, the statement has been deleted in the FEIS/MP. Essentially, the statement meant that if two regulations exist covering an activity in the Sanctuary, one promulgated by NOAA under the MPA authority and the other by another agency under a different statute, compliance with the less restrictive regulation will not relieve the obligation to comply with the other more restrictive one.

Comment: NOAA should follow the guidelines of NEPA when proposing any change in regulations that are listed in the scope of regulations. This is especially applicable to vessel traffic and discharge regulations. Also, clarification is needed on the rulemaking and amendment processes.

Response: Listing activities in the scope of regulation reflects that the issues and alternatives were addressed in the FEIS/MP, public hearings were held, and public comments were solicited regarding the activities. If NOAA later proposes the regulation of an activity listed in the scope of regulations in the Designation Document but not regulated at the time of Sanctuary designation, NOAA will request public comments on the proposal. When NOAA plans to amend a rule that has been promulgated, an analysis of the issues, affected environment, alternatives and consequences will be

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completed and public comments solicited. NOAA will then modify the proposal if necessary and respond to public comments when taking the final action.

**Comment:** A procedure must be established to disagree with management and issue an appeal if permits to conduct research are denied.

**Response:** Section 925.12 of the Sanctuary regulations set forth the procedures for appealing denials of Sanctuary permits. The appeal process involves a written statement by the appellant to the Assistant Administrator of NOAA. The Assistant Administrator may conduct a hearing on the appeal.

**Comment:** Clarify the procedure for obtaining permits for low-flying aircraft engaged in ongoing species monitoring studies and damage assessment studies in response to an incident such as an oil spill. Activities authorized by the NMFS and USFWS should not require a Sanctuary permit because the requirements for permits would be duplicative.

**Response:** All flights engaged in monitoring or research activities that fly below 2,000 feet are required to obtain a Sanctuary permit, or, if the activity is already pursuant to a permit, to have that permit certified. Permits are not required for overflights necessary to respond to emergencies threatening life, property or the environment.

**Comment:** NOAA should not grandfather existing uses if otherwise prohibited by sanctuary regulations.

**Response:** Section 304(c)(1)(B) of the MPRSA specifies that NOAA may not terminate any valid lease, permit, license, or right of subsistence use or of access, if the lease, permit, license, or right "is in existence on the date of designation of any national marine sanctuary . . . ."

**Comment:** Treaty secured rights should not require sanctuary certification and registration. Further, NOAA should obligate federal regulators to consider and protect tribal interests when issuing permits which may affect those interests.

**Response:** Treaty secured rights do not require certification by the Sanctuary program.

**Comment:** The regulations, exemptions and authority to place conditions on existing permitted activities are unclear.

**Response:** Section 304(c)(2) of the MPRSA provides NOAA with the right to regulate the exercise of a lease, permit,
license, or right of subsistence use or of access existing on the effective date of Sanctuary designation.

Comment: Sanctuary management should be formally coordinated with tribal regulatory and law enforcement authorities through cooperative agreements.

Response: Cooperative agreements will be developed as necessary between NOAA and the tribes regarding regulatory and law enforcement activities.

Comment: The Sanctuary should offer increased enforcement which should be conducted by Sanctuary personnel rather than the U.S. Coast Guard. Clarify the enforcement procedures.

Response: There will be enforcement of Sanctuary regulations through cooperative agreements with the U.S. Coast Guard, NMFS, WDF, the coastal tribes, USFWS, and the National Park Service (NPS). Considering fiscal constraints, level of use, and availability of enforcement personnel working in the field already, NOAA has determined that it is not a high immediate priority to hire Sanctuary enforcement personnel. The Sanctuary must first become fully staffed and operational, and a determination must be made whether additional enforcement personnel are needed. The enforcement procedures will be determined pursuant to the cooperative agreements that are established.

Comment: The broad scope of the discharge prohibition will require a well-coordinated enforcement operation to monitor all discharge and disposal activities from sources on land as well as in offshore, coastal and inland waters over large areas outside of the Sanctuary boundary. It may be impossible to determine the origin of discharges or deposits found in the Sanctuary after the dumping activity has occurred.

Response: The prohibition on discharges from outside the boundary relates to discharges that enter and injure Sanctuary resources. NOAA must establish that discharges not only enter, but injure the resources before enforcement actions will be taken. It will, therefore be desirable for NOAA to undertake a comprehensive monitoring program by which it can determine ecosystem health and use impacts.

Comment: NOAA should impose unlimited liability for spills extended to shipping companies and firms providing original source materials involved in polluting activities.

Response: NOAA is permitted to seek penalties of up to $100,000 per day for a violation pursuant to Section 307(c)(1) of the MPRSA (16 U.S.C. 1437(c)(1)), and for
natural resource damages pursuant to section 312 of the MPRSA (16 U.S.C. 1443).

Transboundary Coordination

**Comment:** NOAA should coordinate with other Federal and Canadian authorities to regulate vessel traffic, reduce the risk of oil spills, and eliminate oil and gas drilling in Canadian waters adjacent to the proposed sanctuary. NOAA should encourage an adjacent sanctuary along the west coast of Vancouver Island.

**Response:** NOAA agrees and is working with the Canadian Coast Guard, the U.S. Coast Guard and the Washington OMS to reduce the risk of oil spills. The regulation of vessel traffic will currently remain with the U.S. and Canadian Coast Guards and the OMS. NOAA will support any Canadian initiative to designate a marine protected area in Canadian waters on the Pacific Coast.

Beach Management Policies

**Comment:** NOAA should grandfather in the existing beach management policies including allowable beach driving activities.

**Response:** The boundary of the Sanctuary does not encompass beaches where beach driving is permitted.

Advisory Committee/Decision Making

**Comment:** NOAA and the State of Washington should work together to determine the composition of the Sanctuary Advisory Committee (SAC). The SAC should include representatives from private landowners, local industry, the county and tribes. The SAC should be based at the local level to oversee operations and help maintain strong local input.

**Response:** NOAA will work with local user and interest groups and state and local governments to obtain broad representation on the SAC. The law limits the SAC to no more than 15 members.

**Comment:** The SAC should have the power to direct the Sanctuary manager and set priorities for funding. The SAC decisions should be binding. If the decisions are not binding, then the manager should at least provide a rationale for any actions taken which are directly contrary to the recommendations of the SAC.

**Response:** The SAC recommendations to the manager will
be instrumental in guiding the manager with respect to prioritizing actions. If the manager chooses not to pursue the recommendations of the SAC, a rationale will be provided to the members of the SAC.

Comment: One of the first tasks of the SAC should be to review and update the State of Washington’s coastal zone management program to ensure consistency with the Sanctuary management plan. The Sanctuary management plan goals and objectives should also be reviewed.

Response: Prior to designation, the State of Washington will review the FEIS/MP as part of its consistency determination as it relates to Washington’s approved coastal zone management program. The WDOE has jurisdiction for the Shoreline Management Act. The SAC will not share that jurisdiction, rather, the SAC will be responsible for reviewing the Sanctuary management plan goals and objectives. The SAC’s first priority will be to help determine the five-year Sanctuary operating plan establishing priorities for education, research, monitoring, facilities siting and administration.

Miscellaneous

Comment: Firearms should be controlled or banned within the Sanctuary.

Response: Possession and use of firearms is regulated by State law for public safety purposes. The primary purpose of Sanctuary designation is resource protection.

Management Alternatives/Strategies

Comment: The administrative models being discussed in the Northwest Straits proposal should be considered.

Response: The administrative model identifying NOAA as the lead agency in managing the sanctuary with guidance and assistance from the SAC (which will represent State and local interests) will be implemented in the Olympic Coast National Marine Sanctuary. The administrative model which involves joint administration between NOAA and the State of Washington was not considered for the Olympic Coast National Marine Sanctuary because the Sanctuary is predominately in Federal waters. One model suggested for the proposed Northwest Straits National Marine Sanctuary focuses on joint administration because the Sanctuary would be located entirely within State waters. NOAA will work closely with the state and counties and other Federal agencies in the administration of the Olympic Coast National Marine Sanctuary.
Comment: The management plan needs to account for tribal sovereignty and jurisdiction with respect to cultural resources, law enforcement and research practices. NOAA needs to recognize the need to coordinate with each tribal entity in the same manner as with the state and its management agencies.

Response: NOAA acknowledges the importance of tribal sovereignty. Nothing in the designation will impact the treaty rights of the coastal tribes. NOAA will consult closely with the tribes on any action that may potentially impact tribal rights or interests.

Comment: NOAA should choose management plan alternative 1 which proposes to gradually phase in program activities and staffing. Staff could be co-located with another Federal agency in Port Angeles, with satellite sites in Klaloch or La Push. National concerns with fiscal restraint support this choice.

Some commenters supported management plan alternative 2 which proposes to set up the sanctuary headquarters and immediately provide full-staffing. Sanctuary headquarters should be located on the coast. The former Makah Air Force Station is one possible location.

Response: NOAA is experiencing the fiscal constraints that all Federal programs are experiencing. NOAA proposes to balance the needs for resource protection and fiscal restraint by phasing in staffing and maximizing cooperative relationships with other agencies and jurisdictions working in the area (e.g., NPS, U.S. Coast Guard, the tribes, and the USFWS) to implement the management plan. The Sanctuary manager will have an office on the Olympic Coast with administrative support facilities in Seattle.

Comment: Implementation of the final management plan must be adequately funded in order to prevent pollution and resource damage.

Response: The level of funding for the first year after Sanctuary designation will depend upon the Sanctuary Program’s funding which is authorized and appropriated by Act of Congress. However, the reality of the program’s funding situation will require the manager and SAC to identify alternative sources of funding for Sanctuary programs.

Comment: A volunteer program, coordinated by a full-time volunteer coordinator, should be established to assist in implementation of the management plan.
Response: NOAA agrees that the establishment of a volunteer program can assist in implementation of the management plan. The SAC will be influential in determining the priority of hiring a volunteer coordinator.

Comment: The management alternatives should more accurately describe NOAA's comprehensive planning as implemented through a combination of legal management authority over certain specific Sanctuary activities and advisory coordination with other entities managing the remaining essential components.

Response: NOAA agrees. The FEIS/MP outlines the regulations which NOAA is promulgating. The FEIS/MP also outlines the role of the SAC, whose composition is aimed at enhancing the coordination with other entities with management jurisdiction in the Sanctuary.

Comment: The Sanctuary manager should have a great deal of responsibility for setting the Sanctuary budget, as well as assigning funds to local governments for assistance in implementing management plans.

Response: The Sanctuary manager will have primary responsibility for recommending the Sanctuary budget to headquarters. The Sanctuaries and Reserves Division has responsibility for the entire National Marine Sanctuary Program budget, and will work with the site manager to develop the annual program budget. The manager has the discretion to earmark funds to local governments or groups to implement Sanctuary programs.

Comment: Zoning plans should be implemented which accommodate the varying resource management needs within the Sanctuary. Some zoning examples include allowing for the needs of ports to the south, designating areas which would be closed to all consumptive uses on a rotating basis, and zoning specific areas within the sanctuary for the sole purposes of research, recreational use, commercial use and no use.

Response: Zoning is not anticipated as part of the FEIS/MP for the Sanctuary. If NOAA, in consultation with the SAC, believes that zoning would better meet the needs of the program, the management plan and regulations can be amended in accordance with the requirements of the MPRSA, the NEPA and the APA.

Research/Education Protocol

Comment: Research results and data should be shared through existing databases with Federal and state agencies and tribes. The sharing of data should be formalized through cooperative agreements.

Response: NOAA agrees that research results and data should
be shared and will pursue appropriate cooperative agreements to ensure this coordination.

Comment: It is unnecessary to severely restrict or eliminate activities such as fishing, commercial vessel activity, dredging and aircraft operation in order to carry out the Sanctuary goals of promoting research and public education.

Response: The primary goal of sanctuary designation is the comprehensive long-term protection of marine resources. Some restrictions are necessary to accomplish this goal. Of the above activities, only dredging is being eliminated within the Sanctuary boundary. Research and education provide additional means to promote the goal of marine resource protection.

Comment: Geophysical exploration should not be prohibited, as the information gathered from this research can benefit coastal communities and academic institutions.

Response: NOAA's emphasis on research within the Sanctuary allows for research which may involve an otherwise prohibited activity (such as alteration of or construction on the seabed) as long as researchers obtain a research permit pursuant to section 925.9 of the Sanctuary regulations. NOAA will determine the environmental consequences of the proposed research, including short and long term effects on marine biota (such as noise which may interfere with cetacean communication) in deciding whether to issue a permit.

Comment: The research program should stress applied research such as research which can facilitate fisheries management, provide information on long-term environmental trends, and provide links between the marine systems and the adjacent terrestrial systems. Providing research results to decision makers at the various governmental levels would be an important link in addressing marine resource problems.

Response: NOAA agrees and has clarified this point in the research section of the management plan.

Comment: Criteria for acceptable research within the Sanctuary should be established prior to formal designation of the Sanctuary. The criteria should be used in review of research permit applications, and an appeal process should be established in the case of research permit application denial.

Response: Research permit applications will be reviewed on a case-by-case basis and evaluated to determine the potential short and long term impacts of the proposed activities. In addition, section 925.12 of the regulations sets forth the procedures for appealing to the Assistant Administrator the denial of a research permit.
Comment: NOAA should conduct research into the effects of fishing activities on the entire marine system. Fish stocks, species abundance, and monitoring information should be presented to the PFMC.

Response: The National Ocean Service (which includes the Sanctuaries and Reserves Division) and the NMFS have entered into a Memorandum of Understanding outlining the working relationship between the Sanctuary Program and the NMFS. The PFMC will be involved in this agreement, through its relationship with the NMFS. Research which benefits the overall goal of resource protection is addressed within this agreement by highlighting the need for interagency coordination, research and monitoring.

Comment: The benefits of sanctuary designation to the fishing community and others should be clearly articulated. Additionally, connections between the regulations and resource protection should be integrated in the education plan (e.g., establishing warning signs at popular access sites to alert boaters and hikers to the effect of disturbance of pelagic birds and marine mammals.)

Response: NOAA agrees and has clarified the education goals in the Sanctuary management plan. NOAA has articulated the benefits of the Sanctuary program for the fishing community. NOAA will coordinate with the USFWS and the NPS to post warning signs around critical marine bird and mammal habitat.

Comment: NOAA should provide for increased education and interpretation of the shoreline through a variety of media. Educational materials and outreach programs should be developed by pre-existing facilities and organizations on the Olympic Peninsula.

Response: Sanctuary designation will provide for increased education and interpretation of the entire Sanctuary ecosystem. Education materials and outreach programs will be developed in cooperation with existing Federal, tribal, state and local entities.
**ISSUE:** INFORMATIONAL AMENDMENTS TO THE DEIS/MP

**Biological Amendments**

**Comment:** The discussion of the neretic and shelf edge environments in the DEIS/MP needs to be expanded. The resource assessment must stress the biological richness of the area.

**Response:** The resource assessment describing the ecosystem of the Sanctuary study area has been expanded in the FEIS/MP.

**Comment:** Biological resources need to be discussed in terms of ecosystem interactions and not single species descriptions.

**Response:** NOAA has expanded the discussion to include a description of the study area from an ecosystem perspective.

**Socioeconomic**

**Comment:** The FEIS/MP must contain a socioeconomic impact study of the regulations on the affected coastal communities and Tribes. Failure to consider and mitigate these impacts violates the NEPA and Federal Trust responsibility to Indians.

**Response:** An economic analysis has been included within the FEIS/MP. NOAA is not promulgating regulations that will unduly burden the tribes. The regulations have provisions that recognize treaty secured rights. In addition, NOAA will consult with the tribes when considering permits affecting proposed development activities in the Sanctuary. NOAA believes that the regulations do not conflict with the economic interests of the tribes since the regulations offer increased protection for those natural resources critical to the tribal economy.

**Comment:** The Federal government should investigate the possibility of tax breaks to offset economic impacts of the management plan.

**Response:** NOAA’s actions do not add economic burdens to the area. The issue of tax breaks should be addressed to an individual’s representatives in Congress. NOAA does not have the legislative authority to address tax laws.

**Supplemental Draft Environmental Impact Statement**

**Comment:** NOAA should submit a supplemental Draft Environmental Impact Statement for the following reasons: 1) the DEIS/MP lacks a satisfactory examination of the socioeconomic impacts of the regulations on the coastal communities; 2) the DEIS/MP contains erroneous information related to port activities in Grays Harbor; 3) some information is missing, outdated, or inaccurate; 4) inadequate definition of the unique environment.
Response: NOAA has determined that the matters for which an SEIS has been requested can be addressed in the FEIS/MP. The FEIS/MP addresses the socioeconomic impacts of regulations that could potentially affect the coastal communities in the alternatives and consequences section. Further, the vessel traffic section has been amended substantially to provide a detailed description of the significance of vessel traffic to the coastal communities. Additionally, the description of the marine environment under consideration has been expanded greatly.

Management

Comment: NOAA needs to address or recognize a number of current local and state regulatory controls in place within the shoreline areas.

Response: NOAA has addressed local and state regulatory controls within the shoreline areas. These controls are listed in Appendix J.
Table 7. Individual Commenters

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Mary T. Hodgson
Lisa Hoff
Edward P. Hoffman
Tracie Hornung
Steve Horsill
Grace Hubenthal
Claudia Hubenthal
Dennis/Melanie Humfleet
Janette M. Hursh
Linda Ikeda
Matt Irinaga
Dorothy E. Jackins
Mrs. Judith L. Jackson
Hugh A. Jennings
Mr. Allen Johnson
Carl R. Johnson
Johnson Family
Dale R. Johnson
Morgan A. Jones
Marita Justice
Claudia L. Justis
George Kaminsky
Camilla Kelly
Jacqueline Kettman
Dianne S. Kirst
J. Klostermeyer
Mr./Mrs. Leonard Knecht
Dana Knizkerbocker
Roger/Phyllis Knight
David Kramer
Allen Kreger
Y. Kutt
Nancy N. Kroening
Dr. Daniel Krog
Max J. Krueger
Walter Kucij
Theresa/John Kwieinski
John P. Lacy
Greg Lambert/
Patricia Fannigan-
Lambert
Mark Langner
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Robert P. Lee
Ann Lennartz
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Ray Maddux
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Sharon Merrill
Kay Metcalf
William Michel
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Craig F. Miller
Jeff Miller
John Mills/Patricia Kubala
Nancy Mills
Mrs. J.R. Mitchell
Vicki Morris
Peter Moser
Mrs. Albert Moss
Jennifer Moss
Joan/Stan Muench
Leo J. Muraro III
Scott Murdoch
Herbert E. Nelson
Dave Neupert
Duncan/Dennis Neuzil
Tamara Newport
Mr./Mrs. Nils von Vein
David Nordstrom
Lee Norton
Mr./Mrs. Kelly Obad
Judy Ogilvie
Lili Ohse
John Olson
Keith M. Oublanica
K.A. Padden
Mrs. Charles Paine
I. Wesley Padnoe
R.T. Paine
Mary E. Paulsen
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Henry Penn
Marlene Penry
Breida Peterson
Craig Peterson
George Pickett
Marilyn Pierce
Eric Ross Pierce
Erik Lee Pierce
Mary R. Pierce
Carol Plank
Mary Plunkett
Chris/Andrew Poje
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Nancy Price
Heather Pullen
Mark Pullen
Barbara R. Questad
Jack Raidy
Peggy Jo Randall
S. Fred Rapp
Krista Rave
Pamela Raddy
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John Dixon/Noriko Riggleman
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Glorian Robben
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### Table 8. Public Hearing Speakers

**November 6, 1991**  
**Port Angeles, WA.**

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</table>

**November 7, 1991**  
**Seattle, WA.**

| Jim Gunsolos  | Jim Lowery  | Pat Putnam  |
| Bruce Agnew  | David McCraney  |               |
| David McCraney  | David Heiser  |               |
| Mike Lowry  | Eric Johnson  |               |
| Priscilla Collins  | Laurie Sardina  |               |
| Cathy Becker  | Robert Gordon  |               |
| Michael Gayler  | Peter Andrews  |               |
| Jim Goettler  | Christine Platt  |               |
| Rachel Saunders  | Jeff Parsons  |               |
| Rod Sandelin  | Harper Hill  |               |
| Donna Osseward  | Sandy Moore  |               |

**November 12, 1991**  
**Olympia, WA.**

| Jim Lowery  | David McCraney  |               |
| Therese Swanson  | David Heiser  |               |
| Bob Basich  | Eric Johnson  |               |
| Mary Paulson  | Laurie Sardina  |               |
| Phyllis Shrauger  | Robert Gordon  |               |
| John Stevens  | Peter Andrews  |               |
| Russel Richardson  | Christine Platt  |               |
| Stan Lattin  | Jeff Parsons  |               |
| O'Lean Williamson  | Harper Hill  |               |
| Sue Patnude  | Sandy Moore  |               |
| Ken Kimura  | Meta Heller  |               |
| Ernest Hensley  | Nigel Blakley  |               |
| Ben Watson  | Fred Felleman  |               |
| Larry Westfall  | David Dickinson  |               |
| Leroy Tipton  | Scott Richardson  |               |
| Dennis Benn  | Mike Leigh  |               |
| Diane Ellison  | David Jennings  |               |
| William Pickell  | Kenneth Dzinkal  |               |
| Chuck Peterson  | Judith Johnson  |               |
| Doug Ficke  | Eli Sterling  |               |
| Jim Fox  | Markus Tengesdal  |               |
| Ellen Pickell  |               |               |
| Jim Walls  |               |               |
| Steve Barnowemeyer  |               |               |
| Lionel Brown  |               |               |
| Louis Messmer  |               |               |
| Ray Nelson  |               |               |
| Chandra Coski  |               |               |
| Joe Early  |               |               |
| Stanley Trohimovich  |               |               |
| John Olson  |               |               |
| Darlene Caldwell  |               |               |
| Glenn Sundstrom  |               |               |
| Fred Sharpe  |               |               |
| Marina Littleton  |               |               |
**Table 8. Continued**

**November 14, 1991-**  
**Seaview, WA.**

Ann Saari  
John Baker  
Fred Mattfield  
Scott McMullen  
Virginia Leach  
Ernie Soule  
Kathleen Sayce  
William Tufts  
Gordon Tompkins  
Ernie Soule  
Nance Main  
Lee Weighardt  
Kathleen Boyle  
Frank Wolfe  
Frank Christhilf

**November 20, 1991-**  
**Washington, D.C.**

Jeff Sass  
Jack Sobel
### Table 9. Petitions

<table>
<thead>
<tr>
<th>Subject Supports</th>
<th>Signatures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) designation of the Olympic Coast National Marine Sanctuary; 2) permanent ban on oil drilling throughout Sanctuary; 3) a plan of action to address commercial vessel traffic (especially tankers and barges); 4) ban on Navy's practice bombing of Sea Lion Rock; 5) boundary alternative #4 as the smallest acceptable boundary alternative; 6) protection for Willapa Bay and Grays Harbor; and 7) adequate funding and staff.</td>
<td>30</td>
</tr>
<tr>
<td>1) permanent ban on oil and gas development; 2) near shore tanker transits; 3) Navy bombing practice along the entire Washington Coast; and 4) boundary alternative #5.</td>
<td>17</td>
</tr>
<tr>
<td>Supports complete ban on oil and gas exploration and development.</td>
<td>23</td>
</tr>
<tr>
<td>1) boundary alternative #5; 2) permanent ban on oil and gas drilling; and 3) protection of the Sanctuary from vessel traffic and military activities, particularly ending the Navy's bombing of Sea Lion Rock.</td>
<td>11</td>
</tr>
<tr>
<td>1) designation of the Olympic Coast Marine Sanctuary; 2) boundary alternative #5; 3) permanent ban on oil and gas drilling; and 4) designation of the Hood Canal, and Whidby, Marrowstone, and the San Juan Islands as Marine Sanctuaries.</td>
<td>6</td>
</tr>
<tr>
<td>1) designation of the Olympic Coast National Marine Sanctuary; 2) permanent ban on oil and gas drilling; 3) commercial vessel traffic management plan and implementation strategy; 4) permanent ban on practice bombing of Sea Lion Rock; 5) boundary alternative 5; and 6) protection for the Strait of Juan de Fuca.</td>
<td>197</td>
</tr>
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Appendix B: NOTICE OF NATIONAL MARINE SANCTUARY DESIGNATION; FINAL RULE; AND SUMMARY OF FINAL MANAGEMENT PLAN
DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

15 CFR Part 925

[ ]

RIN

Olympic Coast National Marine Sanctuary Regulations

AGENCY: Office of Ocean and Coastal Resource Management (OCRM), National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA), Department of Commerce (DOC)

ACTION: Notice of National Marine Sanctuary Designation; Final Rule; and Summary of Final Management Plan.

SUMMARY: The National Oceanic and Atmospheric Administration (NOAA), by the Designation Document contained in this notice, and as required by Section 205(a)(4) of Pub. L. No. 106-627, designates an approximately 2,500 square nautical mile area of coastal and ocean waters, and the submerged lands thereunder, off the Olympic Peninsula of Washington State, including the waters of the Strait of Juan de Fuca eastward to Koitlah Point, as the Olympic Coast National Marine Sanctuary (Sanctuary). This notice publishes the final Management Plan detailing the goals and objectives, management responsibilities, research activities, interpretive and educational programs, and enforcement, including surveillance, activities for the Sanctuary.

Further, NOAA, by this notice, issues final regulations to
implement the designation by regulating activities affecting the Sanctuary consistent with the provisions of the Designation Document. The intended effect of these regulations is to protect the conservational, recreational, ecological, historical, research, educational, and aesthetic resources and qualities of the Sanctuary.

**Effective Dates:** Pursuant to Section 304(b) of the Marine Protection, Research, and Sanctuaries Act (16 U.S.C. § 1434(b)), the Governor of the State of Washington has 45 days of continuous session of Congress beginning on the day on which this notice is published to review the designation and regulations before they take effect. After 45 days, the designation and regulations automatically become final and take effect. However, if the Governor of the State of Washington certifies within the 45-day period to the Secretary of Commerce that the designation or any of its terms are unacceptable, the designation or the unacceptable terms cannot take effect in the area of the Sanctuary lying within the seaward boundary of the State. If the Secretary considers that such disapproval will affect the designation in a manner that the goals and objectives of the Sanctuary cannot be fulfilled, the Secretary may withdraw the designation. A document announcing the effective date will be published in the Federal Register.

**ADDRESSES:** Copies of the Final Environmental Impact Statement
and Management Plan (FEIS/MP) prepared for the designation are available upon request from the Sanctuaries and Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration, 1305 East West Highway, Silver Spring, MD 20910, (301) 713-3125.

FOR FURTHER INFORMATION CONTACT: Nina Garfield, (301) 713-3141.

SUPPLEMENTARY INFORMATION:

I. Background

Section 303 of the Marine Protection, Research, and Sanctuaries Act, as amended (the "Act" or "MPRSA"), 16 U.S.C. § 1433), provides that the Secretary may designate any discrete area of the marine environment as a National Marine Sanctuary if the Secretary determines that such designation will fulfill the purposes and policies of the Act as set forth in Section 301(b) (16 U.S.C. § 1431(b)) and finds that: (1) the area is of special national significance due to its resource or human-use values; (2) existing state and Federal authorities are inadequate or should be supplemented to ensure coordinated and comprehensive conservation and management of the area, including resource protection, scientific research, and public education; (3) designation of the area as a national marine sanctuary will facilitate the coordinated and comprehensive conservation and management of the area; and (4) the area is of a size and nature that will permit comprehensive and coordinated conservation and management.
The authority of the Secretary to designate national marine sanctuaries and administer the other provisions of the Act has been delegated to the Under Secretary of Commerce for Oceans and Atmosphere by DOC Organization Order 10-15, section 3.01(z), January 11, 1988. The authority to administer the other provisions of the Act has been re-delegated to the Assistant Administrator of NOAA for Ocean Services and Coastal Zone Management by NOAA Circular 83-38, Directive 05-50, September 21, 1983, as amended.

The coastal and ocean waters off the Olympic Coast were recognized for their high natural resource and human use values and placed on the National Marine Sanctuary Program Site Evaluation List (SEL) in August of 1983 (48 FR 35568). In 1988, Congress reauthorized and amended the Act and directed the Secretary to designate the Olympic Coast National Marine Sanctuary (P.L. 100-627, section 205(a)). In report language accompanying this legislation, Congress noted that the Olympic Coast possesses a unique and nationally significant collection of flora and fauna, and that adjacency of the area to the Olympic National Park merits the designation of this area as a national marine sanctuary (H. Rep. No. 4210, 100th Cong., 1st. Sess., 1988).

NOAA held four scoping meetings in Washington State April 10-13, 1989, to solicit public comments on the designation: Aberdeen on April 10, Port Angeles on April 11, Forks on April 12, and Seattle on April 13 (45 FR 10398, March 13, 1989).
On September 20, 1991, NOAA published a proposed Designation Document and proposed implementing regulations and announced the availability of the Draft Environmental Impact Statement/Management Plan (DEIS/MP) (56 FR 47836). Public hearings to receive comments on the proposed designation, proposed regulations, and DEIS/MP were held on November 6th in Port Angeles, November 7th in Seattle, November 12th in Olympia, November 13th in Aberdeen, November 14th in Seaview, and November 20th in Washington D.C. On November 14th, 1991, the period for submitting public comments was extended from November 27th, 1991 to December 13th, 1991 pursuant to requests from the State of Washington and the coastal counties (56 FR 57869). All comments received by NOAA in response to the Federal Register notice and at the public hearings were considered and, where appropriate, incorporated in the final regulations and FEIS/MF. A summary of the comments on the proposed regulations and the regulatory elements of the DEIS/MP and NOAA’s responses to them follow.
ISSUE:     BOUNDARIES

BOUNDARY ALTERNATIVE 1

Comment: NOAA should choose boundary alternative 1 because: 1) it contains most of the unique ecological features off the Washington Coast; 2) NOAA can offer greater protection to the coastal features than the resources further offshore in the event of a spill of hazardous materials; and 3) vessel traffic would be least affected, thereby ensuring safer seas.

Response: NOAA disagrees. Boundary alternative 1 contains most of the ecological features visible above the sea surface. However, a marine sanctuary should encompass a discrete ecological unit with definable boundaries (16 U.S.C. § 1433(b)(1)(F)). The marine mammals and seabirds that transit the waters off the Olympic Peninsula and colonize the offshore rocks and islands forage in the rich waters and benthic communities over and on the continental shelf. The shelf is broad off the Strait of Juan de Fuca. The seaward extent of the shelf coupled with the upwelling produced from the Juan de Fuca Canyon are the physical parameters that support the food chain from the plankton to the marine mammals and seabirds. The offshore rocks and intertidal communities are only one habitat within the marine ecosystem off the Olympic Coast. Therefore, the marine sanctuary should encompass the ecologically significant offshore waters.

With respect to NOAA's ability to protect the offshore waters in the event of a spill, NOAA agrees that there is little that can be done once a spill has occurred. The high seas would
most likely render response capabilities ineffective. However, NOAA will coordinate with the U.S. Coast Guard, the Washington State Office of Marine Safety, and the coastal tribes to ensure that there is an adequate response capability for the coastal waters, intertidal regions, and beaches along the sanctuary including seabird and marine mammal rescue capabilities.

Extension of the Sanctuary boundary to the shelf edge provides a buffer area for protecting the coastal resources. NOAA is working with the U.S. Coast Guard to develop a proposal for an Area to be Avoided (ATBA) from the shoreward boundary to 25 nautical miles offshore of the Olympic Peninsula. This ATBA is designed to provide sufficient time to respond to a vessel that loses power off the Olympic Peninsula. The ATBA is compatible with many of the existing voluntarily adhered to traffic patterns along the coast and thus adds only minimal time and distance to transits between the Strait of Juan de Fuca and destinations to the south.

BOUNDARY ALTERNATIVE 2

Comment: NOAA should choose boundary alternative 2 as the preferred alternative.

Response: NOAA disagrees for the same reasons stated in response to the previous comment. The seaward extent of boundary alternative 2, which approximates the 50 fathom isobath, has no relation to the seaward extent of the coastal ecosystem.
BOUNDARY ALTERNATIVE 3

Comment: NOAA should choose boundary alternative 3 as the preferred alternative.

Response: Boundary Alternative 3 excludes the Juan de Fuca Canyon, which is one of the richest regions of the offshore oceanic ecosystem. It also excludes some of the highest concentrations of human uses which threaten the health of the marine ecosystem off the Olympic Peninsula.

Comment: NOAA should not choose boundary alternative 3 as the preferred alternative because it will be too restrictive for vessel traffic.

Response: NOAA is proposing no regulations that will unduly restrict vessel traffic. (See response to comment on boundary alternative 1).

BOUNDARY ALTERNATIVE 4

Comment: NOAA should select boundary alternative 4 as the preferred alternative because: 1) many of the unique unspoiled ecological resources that might be significantly impacted by oil are located in the physically complex area north of Pt. Grenville including areas of submarine canyons, productive fishing grounds, and coastal features that are critical habitat; 2) Sanctuary status in the southern portion of the study area would conflict with state managed activities such as dredged material disposal, while most of the shoreline in the north has little commercial
Response: NOAA agrees. One of the most valuable qualities of the Olympic Peninsula is that it is undeveloped and relatively pristine. NOAA recognizes that the southern portion of the boundary is much more developed, especially with respect to the harbor maintenance activities in Grays Harbor. Further, the rocky intertidal habitats in the north are much more sensitive to pollution from oil and gas compared to the sandy beach environments in the southern portion of the study area. In the event of a spill of hazardous materials, experts predict that it would take years for intertidal communities of rocky intertidal environments to become reestablished, whereas it would take an order of months for the sandy intertidal communities to recolonize. Lastly, NOAA can expand Sanctuary boundary 4 in the future, in accordance with the requirements of the Marine Protection, Research, and Sanctuaries Act (MPRSA), the National Environmental Policy Act (NEPA), and the Administrative Procedure Act (APA), if deemed necessary.

Comment: NOAA should not choose boundary alternative 4 because:

1) it is not scientifically defensible for it fails to protect the important and environmentally delicate estuaries along the southern coast; 2) it would render ineffective NOAA's resource monitoring and sanctuary enforcement mandates; and 3) it will be too restrictive for vessel traffic.

Response: The boundary of a marine sanctuary should
approximate the most identifiable boundaries of a marine ecosystem. The Site Evaluation List (SEL), from which sites are selected for consideration as marine sanctuaries, identified the coastal offshore islands as the core of the proposed Olympic Coast National Marine Sanctuary (originally identified as the Western Washington Outer Coast). With this focus, NOAA has determined that the boundaries of the ecosystem are encompassed by boundary alternative 4. NOAA recognizes that the coastal estuaries are ecologically valuable and that many organisms that exist within, or transit through boundary alternative 4, depend on the estuaries. However, while the estuaries and outer coast are ecologically linked, the productivity of the two environments is a function of very distinct environmental processes.

NOAA believes that protection of the estuaries could be best achieved through possible inclusion of these areas in programs targeting estuarine management such as, the National Estuarine Research Reserve System, the National Estuary Program, or the Coastal Zone Management Program.

NOAA believes that the size of the sanctuary encompassed by boundary alternative 4 is manageable with respect to research and monitoring initiatives.

As discussed above, NOAA is working with the U.S. Coast Guard to develop a proposal for an ATBA off the northern Olympic Peninsula. It is designed to be as compatible with existing customary practices among mariners as possible. NOAA is not promulgating vessel traffic regulations with designation.
BOUNDARY ALTERNATIVE 5

**Comment:** NOAA should choose boundary alternative 5 because:
1) activities that are, or could occur, in the southern portion of the study area can affect the resources in the north; 2) the entire study area is ecologically connected; 3) the management needs are greatest in the south; 4) the sanctuary management regime would complement existing management initiatives (Willapa Bay watershed planning processes, Columbia and Snake River Salmon Recovery Planning, State National Heritage Plans); and 5) expansion of the Sanctuary boundary in the future will be too time-consuming.

**Response:** NOAA's preferred boundary alternative is based on an ecologically identifiable boundary. The northern and southern portions of the study area are distinct with respect to their coastal and offshore ecology. NOAA can protect Sanctuary resources from outside activities through the prohibition on discharges outside the Sanctuary boundary that enter and injure Sanctuary resources. NOAA will be involved in planning activities that could potentially threaten Sanctuary resources outside its boundary. The boundary can be expanded in the future if needed.

**Comment:** NOAA should not choose boundary alternative 5 because it is not necessary to encompass the entire Washington coastline as a marine sanctuary, and it would eliminate any future development of the coastal areas.
Response: NOAA agrees. See response to previous comment.

Comment: A more detailed analysis of the impacts of sanctuary designation must be undertaken before seriously considering boundary alternative 5.

Response: NOAA has undertaken an extensive analysis of the uses and ecology of the southern portion of the study area and believes that the ecologically sensitive estuarine environments are adequately protected.

ALTERNATIVE BOUNDARY SUGGESTIONS

Comment: NOAA should establish a series of smaller site-specific areas surrounding unique marine resources, such as ocean waters immediately adjacent to already protected terrestrial ecosystems such as wildlife refuges and the Olympic National Park. This alternative would afford sanctuary status to marine resources while maintaining provisions for compatible ocean uses.

Response: NOAA disagrees. Smaller site-specific areas would not encompass an ecosystem for the reasons stated above. Further, designation of the marine sanctuary would allow for the continuation of pre-existing and compatible uses.

Comment: NOAA's analysis of the resources within the study area identified the southern portion as highly important in terms of wildlife and fishery values, particularly the areas in and surrounding Willapa Bay. NOAA should consider modifying boundary
alternative 4 by adding a satellite site encompassing the estuarine environment and the offshore waters of Willapa Bay.

Response: NOAA's analysis confirmed that the estuarine areas in the southern portion of the study area are significant natural resources and that many of the resources utilize the waters off the northern coast as well. However, NOAA has determined that the estuarine ecosystems are distinct from the higher energy marine environment of the northern portion of the study area. In addition, the activities in, and adjacent to Grays Harbor are managed pursuant to an existing estuarine management plan promulgated pursuant to the Washington State Shorelands Management Act. The residents living in the watersheds of Willapa Bay are currently preparing an estuarine management plan.

Comment: NOAA should consider the creation of a north and south Olympic Coast National Marine Sanctuary with separate but coordinated management regimes.

Response: The Act requires the designation of one sanctuary on the Western Washington Outer Coast with the offshore Islands and coastal areas of the northern Olympic Peninsula as the core area of the sanctuary. In carrying out this mandate, NOAA examined the seaward, northerly, southerly, and easterly extent of the ecosystem that has as its core the intertidal communities of the outer coast.

Comment: The boundary of the Sanctuary should be modified as

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further cetacean information is available.

Response: NOAA can modify the boundary in the future, in accordance with the requirements of the MPRSA, the NEPA and the APA, as more information becomes available.

MODIFICATION OF THE WESTERN BOUNDARY

Comment: The outer boundary of the sanctuary should extend westward to a point that minimizes restrictions and needless re-routing of vessel traffic and harbor maintenance activities at the opening of Grays Harbor. To accomplish this objective, the outer limit of the sanctuary should be set at a distance between 2 and 10 miles from shore.

Response: Sanctuary boundaries are not established based on vessel traffic routes, particularly because routes are subject to change. NOAA will work with existing regulatory agencies to minimize impacts. While vessel traffic is in the scope of sanctuary regulations, NOAA is not promulgating vessel traffic regulations at this time.

Comment: The outer boundary should be established at either the 100 or 500 fathom isobath.

Response: NOAA has established the boundary at the 100 fathom isobath because it is generally recognized to be the seaward extent of the continental shelf, the area where photosynthetic activity is greatest.
Comment: Clarify the rationale for establishing the western boundary of alternatives 4 and 5.

Response: See response to previous comment.

MODIFICATION OF THE SHORELINE BOUNDARY

Comment: The shoreline boundary should be established at the lower low water mark to preclude interference with carefully crafted beach management plans regulating beach traffic, razor clam harvests and emergency aircraft landings.

Response: The shoreline boundary of the Sanctuary is located at the higher high water line where adjacent to Federally-owned land (including the Olympic National Park and the U.S. Fish and Wildlife refuges) and the lower low line mark when adjacent to State-owned land. Thus, the boundary does not interfere with beach management plans. Razor clam harvests within the intertidal zone of the Sanctuary will be managed by existing authorities such as the Washington State Department of Natural Resources, the Quinault Indian Tribe, and the National Park Service. Emergency aircraft landings are permissible in the Sanctuary.

Comment: The shoreline boundary should cut across the mouths of all rivers, streams and estuaries because there are sufficient management plans in place providing protection of inland environments such as the Washington State Coastal Zone Management Program and the Grays Harbor Estuary Management Plan.
Response: The shoreline boundary of the Sanctuary has been modified to cut across the mouths of all rivers, streams and estuaries.

Comment: Clarify why the shoreward boundary distinguishes between adjacency to tribal and non-tribal lands.

Response: The Tribes have jurisdiction to the mean lower low water line and the Sanctuary program does not have the authority to claim jurisdiction over tribal land without the consent of the governing body of the tribes. Both the Tribes and the State have requested that the Sanctuary boundary not overlap with tribal and State lands. Therefore, the coastal boundary has been modified so that it is at mean lower low water when adjacent to tribal and State owned lands and at mean higher high water when adjacent to Federally owned lands.

Comment: Existing National Park Service standards, regulations, and policies must not be diminished as a result of dual designation as a National Park and National Marine Sanctuary. The majority of the intertidal areas of the Olympic National Park are Federally designated Wilderness Area and must be managed accordingly.

Response: The Sanctuary boundary overlaps with the boundary of the Olympic National Park. NOAA will not diminish the standards, regulations and policies currently applying to the intertidal areas of the Olympic National Park. The existing
standards, regulations and policies of the intertidal areas will remain. NOAA will enhance the protection of these intertidal areas by working with the Coast Guard to ensure a safer vessel traffic environment, and the upland users of the watershed to monitor and minimize the impacts of non-point source pollution. Additionally, NOAA will support research and resource monitoring initiatives in the intertidal areas and may seek compensation for damages if an accident were to occur that injures Sanctuary resources.

INCLUSION OF THE STRAIT OF JUAN DE FUCA

Comment: The northeastern boundary of the sanctuary should extend further into the Strait of Juan de Fuca to either: 1) the Lyre River; 2) the Clallam County Marine Sanctuary at Salt Creek; 3) Low Point; 4) Crescent Bay/Agate Beach; or 5) Pillar Point. Omission of the Strait of Juan de Fuca from the Sanctuary excludes the head of the Juan de Fuca Canyon from the boundary of the Sanctuary, and thus represents a boundary not based upon an ecological rationale.

Response: NOAA has examined the resources of the Strait of Juan de Fuca and the FEIS/MP has been revised accordingly. Sections III and IV (Alternatives, and Environmental Consequences) examine the benefits and consequences of various alternatives in the Strait of Juan de Fuca. NOAA believes that the existence of a functional biotic community characteristic of the marine environment extends into the Strait of Juan de Fuca to
Observatory Point. Eastward of Observatory Point, the ecosystem is more characteristic of an estuarine environment.

Despite the ecological arguments that support inclusion of the Strait of Juan de Fuca in the Sanctuary boundary, NOAA does not believe that the public has had ample opportunity to analyze and comment on the proposal to add the Strait. Since the Strait of Juan de Fuca lies entirely in state waters, the Strait of Juan de Fuca cannot be included without the approval of the Governor of Washington State. However, NOAA will pursue expanding the boundary if supported by the State of Washington.

Comment: The boundary of the Sanctuary should be contiguous with that of the proposed Northwest Straits Sanctuary. A gap between these two proposed sanctuaries would cause confusion for commercial shipping and fishing interests and government managing agencies.

Response: At this time, the future and nature of the proposed Northwest Straits National Marine Sanctuary is uncertain and cannot serve as a deciding factor in the determination of the eastern boundary of the Olympic Coast National Marine Sanctuary. The boundary of the Olympic Coast National Marine Sanctuary must be determined based on ecological and human use factors. NOAA can modify the boundary in the future if it is deemed appropriate. NOAA will coordinate with existing managing agencies to ensure that the Olympic Coast National Marine Sanctuary and the proposed Northwest Straits National Marine
Sanctuary do not unduly disrupt the management of vessel traffic and fishing.

Comment: The boundary of the Sanctuary should not encompass the waters of the Strait of Juan de Fuca because closely-monitored vessel traffic lanes already exist.

Response: The MPRSA encourages multiple uses of the Sanctuary as long as they are compatible with the resource protection goals of the Sanctuary. Clearly, the Coordinated Vessel Traffic System in the Strait of Juan de Fuca is in the best interest of the vessel traffic industry and the environment. NOAA would not interfere with the vessel traffic management regime in the Strait of Juan de Fuca if the Governor of the State of Washington supported inclusion of the Strait of Juan de Fuca in the Sanctuary boundary.

NORTHERN BOUNDARY

Comment: The northern boundary of the Sanctuary should be adjacent to the international border and include vessel traffic lanes to facilitate the establishment of a cooperative international sanctuary and coordinated vessel traffic management regime.

Response: The northern boundary is adjacent to the international boundary.
INCLUSION OF THE ESTUARIES

Comment: NOAA recognized both the high resource values of the estuaries and the high level of point source discharges. By including the estuaries in the boundary NOAA would be in a position to work with the Washington Department of Ecology (WDOE) to correct the sources of pollution.

Response: NOAA has been working with the Washington Department of Ecology to address pollution problems in the coastal estuaries. The Grays Harbor Estuary Management Plan was supported by funding provided pursuant to the Washington Shorelands Management Act. NOAA agrees that the estuaries are extremely valuable environments with high levels of point source discharges. However, NOAA believes that the estuaries are ecologically distinct from the offshore waters of the Olympic Peninsula, which is the core area of the Sanctuary. Inclusion in the National Estuarine Research Reserve System (NERRS) is a more appropriate management framework for NOAA involvement in estuarine management.

Comment: The estuaries should be excluded from the Sanctuary boundary because the Washington State Coastal Zone Management Program and the Grays Harbor Management Plan offer sufficient protection to the estuaries.

Response: NOAA agrees. The estuaries are excluded from the preferred boundary of the Sanctuary.
CONSIDERATION OF OTHER NATIONAL MARINE SANCTUARIES AND NATIONAL ESTUARINE RESEARCH RESERVES (NERRS)

Comment: Some commenters believed that NOAA should designate the estuaries as NERR's if they are not included in the boundary of the Sanctuary because of their natural resource values. Other commenters believed that NERR status is inadequate since it does not include the marine environment. Clarification is needed on the specific elements of the NERRS: 1) the degree of protection that the NERRS would provide to Grays Harbor and Willapa Bay; 2) the process of designation; 3) timetable for designation; 4) assurances that designation would occur; and 5) the degree of protection to the estuaries that would be provided in comparison to sanctuary status.

Response: The terms of designation as a NERR are determined between the State and NOAA. The process begins with the nomination of an estuary, or portion thereof, to NOAA for inclusion in the NERRS by the Governor of the State. The State holds scoping meetings in the region nominated for inclusion to solicit public input. The State then prepares a draft environmental impact statement and management plan (DEIS/MP) where boundary, management, and regulatory alternatives are assessed and a preferred alternative is decided upon. The DEIS/MP must demonstrate that the key core land and water areas are adequately protected by the state. Once the DEIS/MP is completed, public hearings are held in the region. After a comment period of one month, the State must produce a Final Environmental Impact Statement/Management Plan (FEIS/MP)
incorporating the public comments. Once NOAA approves the FEIS/MP the Reserve is officially designated. The entire process requires approximately three years. Designation is contingent upon available funding.

Comment: NOAA should encourage sanctuary designations in Northern Puget Sound, Hood Canal, Southern Oregon and Northern California.

Response: NOAA is working with the State of Washington to study the feasibility of a sanctuary in Northern Puget Sound. New candidates for sanctuary status are selected from NOAA’s SEL. Sites in southern Oregon and Northern California are presently on the SEL.

HARBOR EXCLUSION/INCLUSION

Comment: How will sanctuary designation influence the disposal of dredge material from harbor maintenance and development activities that occur in the Port of La Push, the mouth of the Quilleute River, and Neah Bay?

Response: No dredge spoil disposal will be permitted within the Sanctuary. Harbors are excluded from the Sanctuary boundary. Therefore, maintenance and development activities can occur, but disposal of dredge material must be either on land or outside the boundary of the Sanctuary.
GROWTH MANAGEMENT

**Comment:** The Sanctuary should help to limit population growth.

**Response:** The sanctuary program has no control over population growth adjacent to the Sanctuary boundary. Rather, the program exists to ensure that human uses resulting from growth do not have a negative impact on Sanctuary resources.

**Comment:** Private land owners should not lose development rights to their land, nor should they have the value of their land significantly decreased by regulation without due compensation for that loss.

**Response:** NOAA is issuing no regulations that will diminish the development rights of private property owners.

OPPOSITION TO SANCTUARY DESIGNATION

**Comment:** The marine sanctuary should not be designated because: 1) it would shut down the fishing industry; 2) existing legislation and management regimes offer adequate protection; 3) potential industrial interests would be stifled because the sanctuary would over-regulate the local economy and its growth; 4) the ecological/aesthetic values of Washington's coastline are not permanently threatened; 5) local airports in Aberdeen and Ocean Shores would close due to insurance problems; and 6) the Olympic National Park has too much control over the Olympic Peninsula already.

**Response:** The Sanctuary will not shut down the fishing
industry. Fishing is not within the scope of Sanctuary regulation; the regulation of fishing would remain with existing management regimes. Further, the Sanctuary will ensure greater protection from risks due to oil, gas and mineral development and vessel traffic accidents.

NOAA disagrees that existing legislation offers adequate protection of the offshore resources. The threats from such things as vessel traffic, oil and gas development, sand and gravel mining and Navy practice bombing of Sea Lion Rock have not been addressed through a comprehensive management regime that recognizes the value and fragility of the marine ecosystem off the Olympic Peninsula. NOAA does not believe that the Sanctuary will over-regulate the local economy since the main source of income in the region is from tourism, fishing and timber production—none of which will be negatively affected by the Sanctuary. Tourism and fishing will likely benefit from Sanctuary status due to the increased protection of the marine environment.

**ISSUE: ALTERATION OF/OR CONSTRUCTION ON THE SEABED**

**Comment:** The regulation pertaining to alteration or construction of the seabed may be interpreted as prohibiting such activities as geologic research, the placement of current meters, sediment traps and similar research equipment, all of which might be necessary if environmental studies were to be conducted in the Mineral Management Service (MMS) Washington-Oregon planning area.
To clarify the intent of this prohibition, "Government sponsored environmental studies" should be added in the second sentence of this section as one of the activities for which this prohibition does not apply.

**Response:** NOAA supports research within the sanctuary. However, the prohibition on alteration of, or construction on the seabed applies to all research activities, including those conducted by governmental agencies. All research activities conducted within the Sanctuary that violate a Sanctuary regulation must be undertaken pursuant to a Sanctuary research permit to ensure that the impacts from the research are minimal and temporary.

**Comment:** The prohibition on the alteration of, or construction on the seabed should not interfere with current or future harbor maintenance or fishing activities including: 1) jetty and groin construction; 2) permitted dredging of channels and harbors; 3) the use of dredge spoils for underwater berm construction; 4) construction and improvement of boat launching and marine facilities adjacent to reservations; 5) the retrieval of fishing gear (including crab pots) and sunken vessels; 6) bottom trawling and scallop dredging; and 7) tribal fin and shellfish operations. NOAA needs to clarify the exemption of activities incidental to routine fishing and vessel operations. The exemptions for harbor maintenance and fishing activities should read: "attempting to alter the seabed for any purpose other than anchoring vessels,"
normal fishing operations to include commercial bottom trawling and crab pot recovery, and routine harbor maintenance."

**Response:** Ports and harbors are not included within the boundary of the Sanctuary. Further, there is the following exception to the alteration-of-the-seabed regulation: "Harbor maintenance in the areas necessarily associated with Federal Projects in existence on the effective date of Sanctuary designation, including dredging of entrance channels and repair, replacement or rehabilitation of breakwaters and jetties." The boundary of the Sanctuary adjacent to the Port of La Push is congruent with the Colreg lines at the mouth of the harbor. The boundary of the Sanctuary at Neah Bay forms an arc from Koitlah Point to the point of land on the opposite side of Neah Bay. The arc is contiguous with the outer coast of Waadah Island. The noted activities incidental to fishing have been exempted from the Sanctuary regulations.

**Comment:** NOAA should prohibit all dredging and removal of sand and gravel within the Sanctuary boundary.

**Response:** NOAA has prohibited all dredging and removal of sand and gravel within the Sanctuary boundary. These activities threaten the integrity of the benthic community and the food source of many fish, marine mammals and seabirds.

**Comment:** NOAA should not subject the exploration and development of offshore mineral activities to the same restrictions proposed
for the exploration and development of Outer Continental Shelf (OCS) oil and gas.

Response: All of these activities injure the benthic communities in the Sanctuary and NOAA does not believe that there is cause for exceptions.

Comment: Clarify NOAA's policy on establishing artificial reefs within the Sanctuary.

Response: There are no artificial reefs in the Sanctuary as of the date of designation. The creation of new artificial reefs would be prohibited pursuant to the prohibition on alteration of, or construction on, the seabed.

Comment: NOAA should prohibit the construction of pipelines on the sea floor.

Response: The regulation prohibiting the alteration of, or construction on, the seabed would prohibit the construction of pipelines on the sea floor.

ISSUE: CULTURAL AND HISTORIC RESOURCES

Comment: NOAA should prohibit moving, injuring, or possessing historic resources within the Sanctuary.

Response: NOAA agrees that it is necessary to protect and manage historical and cultural resources within the Sanctuary boundary. NOAA has included a prohibition on moving, removing, possessing, injuring, or attempting to move, remove, or injure
these resources, except as resulting incidentally from traditional fishing operations. If NOAA determines that fishing activities are resulting in injury to Sanctuary historic and cultural resources, NOAA may amend the Sanctuary regulations to abolish the exemption for these activities.

Comment: The proposed regulations dealing with cultural resources fail to preserve the tribes' ability to control access to, and removal of, their cultural heritage. Therefore, NOAA should add a new section 925.5(a)(8) prohibiting: "removal or attempted removal of any Indian cultural resource or artifact, or entry onto a significant cultural site designated by a tribal governing body with the concurrence of the Director, except with the express written consent of the governing body of the tribe or tribes to which such resource, artifact, or cultural site pertains." NOAA should pursue a cooperative agreement with the tribes to coordinate management of cultural artifacts of tribal significance.

Response: The MPRSA provides NOAA with the authority to control access to cultural artifacts within the Sanctuary thereby helping to ensure their preservation. Accordingly, anyone proposing to remove a cultural or historic resource must apply for and obtain a sanctuary permit from NOAA. NOAA acknowledges the interest of the coastal tribes to preserve their cultural heritage and, in particular, those cultural artifacts of tribal significance found within the Sanctuary. NOAA considers its
objective of preserving the historical and cultural resources of the Sanctuary to be compatible with the coastal tribes' desire to preserve their cultural heritage. Therefore, NOAA has clarified in section 925.9(d) that "In deciding whether to issue a permit, the Director or designee may consider such factors as . . . the effect of the activity on adjacent Indian Tribes." NOAA will work on a cooperative agreement with the tribes and the State of Washington to clarify the process by which permits will be granted to conduct research or salvage operations on historical and cultural resources of tribal significance.

Comment: Current management of cultural resources is agreed upon between the Bureau of Indian Affairs (BIA) and the tribes. The BIA supports the tribes in the management of their cultural resources.

Response: See response to previous comment.

Comment: The regulation as proposed in the DEIS/MP is duplicative of State law. There already exists state and Federal antiquities acts to protect coastal archeological and historical sites that occur on or near the median high tide boundary. The State archeologist already coordinates archeological matters.

Response: The MPRSA is not duplicative of existing laws protecting historical and cultural resources. The MPRSA is more comprehensive in that it provides enforcement authority, including civil penalties, for the destruction or injury of
historical and cultural resources.

The Abandoned Shipwreck Act of 1987 gives states the title to certain abandoned shipwrecks in state waters. Under the MPRSA, NOAA has trustee responsibilities for abandoned shipwrecks and other historical and cultural resources within national marine sanctuaries, including those located in state waters, for the purpose of protecting them. NOAA will coordinate with State agencies to ensure that historical and cultural resources within the Sanctuary are protected, and that the policies affecting historical and cultural resources in State waters are consonant with the policies in the Federal waters of the Sanctuary.

ISSUE: DISCHARGES

Ocean Dumping

Comment: NOAA should not prohibit the use of dredged material disposal sites off Grays Harbor, Willapa Bay, the Columbia River, or on the north jetty and breakwater of the Port of La Push.

Response: The Sanctuary boundary does not extend south of Copalis Beach and excludes ports and harbors. Therefore, the maintenance activities at La Push and the use of the dredge disposal sites south of the boundary is not prohibited.

Comment: No ocean dumping should be allowed in proximity to the major submarine canyons.

Response: The regulations prohibit ocean dumping within the Sanctuary, and outside the Sanctuary if the material enters and
injures Sanctuary resources or qualities.

Point Source Discharges

Comment: Prohibit discharges of toxics, plastic, and municipal garbage and sewage into the marine environment.

Response: The dumping of municipal garbage, toxics and plastics is prohibited within the Sanctuary by Sanctuary regulations and by regulations promulgated pursuant to the Act to Prevent Pollution from Ships (33 U.S.C. §§ 1901 et seq.) and the Marine Plastic Pollution Research and Control Act of 1987, which implements Annex V of MARPOL 73/78 in the U.S. Point source discharges are allowed provided such discharge is certified by NOAA in accordance with section 925.10 or approved by NOAA in accordance with section 925.11. After expiration of current permits, discharges from municipal treatment plants will be subject to the review process of section 925.11. At a minimum, secondary treatment will be required.

Comment: Current regulations are adequate. NOAA has not proven that the proposed regulations will enhance the recreational or aesthetic appeal, and water quality.

Response: Current regulations do not protect the area from the cumulative impacts of various types of discharges, including: 1) some ocean dumping; 2) sewage receiving only primary treatment; and 3) non-point source discharges. NOAA's ocean disposal regulation offers protection to the offshore environment that does not otherwise exist. NOAA will work with existing
tribal, State and Federal authorities to ensure that the quality of the water and Sanctuary resources are maintained.

**Comment:** Clarify how discharges from drilling and production rigs may be addressed if oil and gas leasing were to occur in the future.

**Response:** The regulations prohibit oil and gas exploration, development, and production activities within the Sanctuary. NOAA will work with the Environmental Protection Agency (EPA) to ensure that best available technology is implemented on any drilling rigs located outside of the Sanctuary to ensure that no discharges enter and injure Sanctuary resources and qualities.

**Comment:** Depositing or discharging from any location within the Sanctuary or from beyond the Sanctuary should be prohibited.

**Response:** The mandate of the National Marine Sanctuary Program is to facilitate multiple uses that are compatible with resource protection. Depositing or discharging most materials within the boundary of the Sanctuary, or from beyond the boundary of the Sanctuary if such material subsequently enters the Sanctuary and injures Sanctuary resources or qualities is prohibited. NOAA will work with EPA, the Tribes and the State of Washington to maintain water quality. NOAA may require special terms and conditions, including (but not limited to) improved effluent quality, on EPA permits to ensure Sanctuary resources and qualities are protected.
Non-Point Source Discharges

Comment: NOAA should not require at a minimum secondary treatment and sometimes tertiary or more for non-point source pollution. It is virtually impossible to subject runoff to these levels of treatment.

Response: NOAA does not require such treatment for non-point source pollution. NOAA will monitor non-point source pollution and work with those living and working in the coastal watersheds to minimize runoff into the Sanctuary.

Comment: It should be stated that there is no intent to regulate forest practices by Sanctuary administrators. There is no research or evidence which would justify the statement made in the proposed DEIS that the "greatest source of non-point discharge is the forest." This statement needs clarification and tree farmers must be assured that they can continue to grow and harvest trees pursuant to Washington's Forest Practices Act, one of the most stringent in the country.

Response: NOAA's Strategic Assessment Branch has analyzed existing watershed data from the National Coastal Pollutant Discharge Inventory to determine sources of runoff. Summaries of pollution discharges for total volumes of nitrogen, lead, and all suspended solids combined indicate that with the exception of suspended solids discharged by paper mills, the greatest source of sediments discharged into sanctuary waters is from natural forest runoff.
Despite this evidence, NOAA will not be directly regulating upland uses. However, NOAA will coordinate with the upland user groups, and managing agencies to minimize non-point source impacts on Sanctuary resources.

Comment: The suggestion that excessive erosion from clear cutting practices is the source of most non-point source pollution from forests supports the need for further study of this common practice and the issuance of more stringent controls due to the steep and unstable slopes and amount of rainfall.

Response: NOAA agrees and will conduct monitoring and research initiatives in coordination with those living and working in the watersheds to minimize the impacts from timbering activities.

Discharges Outside the Sanctuary

Comment: Clarify to what extent the "sphere of influence" of the discharge regulation extends, to what degree it may affect coastal communities including the Tribes, and who determines if injury to a Sanctuary resource has occurred. Would a community such as Ocean Shores or an Indian Tribe face increased water quality regulations or enforcement? Further, does the discharge prohibition apply to particulates that are discharged into the air from pulp mills and subsequently enter the Sanctuary and harm Sanctuary resources and qualities.

NOAA should not impose additional restrictions, beyond the
existing requirements of the Federal Water Pollution Control Act (FWPA), on the discharge of effluent and dredge spoils into marine waters. There is no evidence that additional restrictions on these activities are required to protect water quality in the proposed sanctuary.

**Response:** The MPRSA protects Sanctuary resources and qualities (including water quality) from the impacts of discharges from within and outside the boundary of a Sanctuary whether airborne or waterborne. NOAA is responsible for determining injury to Sanctuary resources. Discharges pursuant to existing permits may be continued subject to the certification requirements of section 925.10. New permits are subject to the review process of section 925.11. At a minimum, secondary treatment will be required for any treatment plants discharging directly into the Sanctuary. With respect to airborne or waterborne discharges outside the Sanctuary, NOAA may condition such permits only if it is established that the discharges are entering the Sanctuary and injuring Sanctuary resources or qualities. NOAA will work closely with all to ensure that no one is unduly burdened by permitting requirements related to discharges. NOAA will coordinate with the State's Air Quality Board and Department of Ecology to monitor air and water quality over and in the Sanctuary.
Application of Discharge Regulations to Vessel Traffic

Comment: The application of this regulation should prohibit organic and inorganic discharges from fishing vessels and submarines (including bilge), aircraft. The prohibition should apply to all naval operations.

Response: The Sanctuary regulations specify the fishing and vessel related activities exempted from the discharge prohibition (section 925.5(a)(2)(i)-(iv)). Discharges and deposits from vessels are prohibited except for specific discharges intended to provide for traditional fishing activities, such as fish wastes resulting from traditional fishing operations in the Sanctuary, and for allowed vessel operations in the Sanctuary, namely biodegradable effluent incidental to vessel use and generated by approved marine sanitation devices, water generated by routine vessel operations, and engine exhaust. Such discharges are determined to be of minimal threat to the Sanctuary and are important for the safe and effective functioning of fishing and other vessels. Other discharges from vessel operations are prohibited. If in the future NOAA determines that increased protection for Sanctuary resources and qualities from these exempted activities is warranted, the Sanctuary regulations could be revised.

Comment: Clarify acceptable and unacceptable discharges from fishing vessels.

Response: See response to previous comment.
Economic Impacts of Discharge Regulations

Comment: Banning the use of approved dredge disposal sites would impose severe economic impacts on marine navigation and commerce, and ultimately to the coastal communities.

Response: The boundary of the Sanctuary does not encompass the approved dredge disposal sites off of Grays Harbor, Willapa Bay, and the Columbia River. However, no new dredge disposal sites may be located within the Sanctuary boundary.

Comment: NOAA must examine the economic impacts of the discharge regulations on existing industries. There are currently 72 identified dischargers in the study area. It is unclear if the proposed Sanctuary would impact the continued operation of the pulp mill’s NPDES permitted discharge near Grays Harbor.

Response: The Sanctuary’s boundary does not extend south of Copalis Beach. Therefore, the only discharge regulation that would apply to dischargers in Grays Harbor would be the prohibition on discharges from outside the boundary that subsequently enter and injure Sanctuary resources or qualities. NOAA will need to establish that effluents from pulp mills are injuring Sanctuary resources or qualities before it would impose terms and conditions on the pulp mill’s NPDES permit. If this situation were to occur, NOAA would work with the discharger, the State of Washington, and EPA to minimize the economic impacts of reducing the impacts.
ISSUE: OIL AND GAS DEVELOPMENT

Comment: NOAA's failure to offer as an alternative an outright, no conditions ban on hydrocarbon development within the Sanctuary is contrary to NEPA regulations, 40 CFR 1502.14 which states that the alternatives section is the heart of the environmental impact statement. NOAA should permanently ban oil and gas exploration, development, and production activities.

Response: Section 2207 of the Oceans Act of 1992 prohibits oil and gas exploration, development and production within the Sanctuary. The Sanctuary regulations repeat this prohibition.

Comment: NOAA should designate a buffer zone based on ocean currents and local seabed geography to prevent damage from external mineral operations.

Response: NOAA believes that the Sanctuary is large enough to buffer the sensitive canyon and coastal ecosystems from negative impacts of mineral development. Further, NOAA's authority to regulate discharges from outside the Sanctuary boundary that subsequently enter and injure Sanctuary resources or qualities provides additional protection over mineral activities.

Comment: NOAA should commit in the FEIS/MP and Record of Decision to the preparation of an EIS before lifting the prohibition.

Response: As previously discussed, the Oceans Act of 1992
prohibits oil and gas explorations, development and production within the Sanctuary. This prohibition may only be lifted by an Act of Congress.

Comment: The oil companies should be excluded from voicing an opinion regarding the Sanctuary because this privilege should be extended only to those who have spent time enjoying the State of Washington coastline.

Response: The Sanctuary program does not and cannot discriminate against any individual, agency, or interest group. All individuals have the right to voice an opinion.

Comment: Has NOAA come across any proposal for offshore wind generated power?

Response: NOAA is not aware of any proposal for offshore wind generated power.

Comment: The President's decision to postpone OCS activities off the coasts of Washington and Oregon until after the year 2000 should expire at that time unless affirmatively extended.

Response: Section 2207 of the Oceans Act of 1992 indefinitely bans oil and gas exploration, development and production within the boundary of the Sanctuary. This prohibitions could only be lifted by an Act of Congress.
Contingency Plans

Comment: The Sanctuary should establish a contingency plan in coordination with existing state and Federal contingency plans. Efforts should be made to coordinate with the State of Washington Departments of Wildlife, Fisheries, Ecology, and Natural Resources and pursue data sharing opportunities.

Response: The FEIS/MP identifies existing oil spill contingency plans and efforts in the State of Washington to cover the Strait of Juan de Fuca and Outer Coast. NOAA will coordinate closely with the existing agencies involved in contingency and emergency response planning, particularly the U.S. and Canadian Coast Guard and the State of Washington Office of Marine Safety (OMS). However, NOAA agrees that the Sanctuary requires its own contingency plan to ensure that resources are protected during events that threaten the environment. A prototype Sanctuary Contingency Plan is being tested at the Channel Islands National Marine Sanctuary. Once implementation experience has been gained, the plan will be adapted to other sites, including the Olympic Coast National Marine Sanctuary. To implement successfully an organized emergency response, NOAA will incorporate state and Federal legislation as well as local efforts into the Sanctuary Contingency Plan.

Comment: NOAA needs to provide for better oil spill response planning.

Response: NOAA is coordinating with the regional response
committees of the OMS to ensure that the equipment is available to address an emergency that would threaten Sanctuary resources.

**Comment:** An Oil Spill Response Center should be sited in close proximity to the Sanctuary to address small spills north of Grays Harbor where there is currently a lack of oil spill response capability.

**Response:** NOAA is promoting this idea in its participation on the regional response subcommittee whose jurisdiction is the Strait of Juan de Fuca and the Outer Coast. However, priority will be placed on the stationing of tugs and barges dedicated to emergency response.

**Comment:** The tribes should be properly funded to handle resource damage assessment as well as other activities where an oil spill could impact their subsistence and ceremonial harvest and cultural values.

**Response:** The reservations are not within the Sanctuary boundary. Therefore, the Sanctuary cannot dedicate funds to the Tribes for the purpose of damage assessment pursuant to a spill of hazardous materials.

**Comment:** NOAA should request that the oil industry’s Marine Spill Response Corporation station a tractor/tug response vessel at Neah Bay.

**Response:** NOAA has made the recommendation to the
subcommittee on emergency response for the Strait of Juan de Fuca and the Outer Coast. NOAA is actively participating in formulating the recommendation to the State, and will coordinate with the Makah Tribe in their planning initiative to expand their marina to plan to accommodate a tug or emergency response vessel that is of appropriate size to service the Outer Coast and the Strait of Juan de Fuca.

Comment: NOAA should ensure that drills are conducted for the Clean Sound Cooperative with outside evaluation.

Response: NOAA intends to hire an operations manager immediately after designation to address issues related to vessel traffic and contingency planning. One of the priorities of this position will be to encourage the Coast Guard to focus on the Sanctuary during its emergency response drills.

Comment: NOAA should propose the examination of extending unlimited liability for spills to the shipping companies and the original firms providing the original source materials involved in the polluting activities.

Response: The MPRSA only provides NOAA with the authority to collect $100,000 per day for each violation pursuant to 16 U.S.C. 1437(c)(1), and damages to Sanctuary natural resources pursuant to 16 U.S.C. 1443.
ISSUE: SEALION ROCK

Comment: NOAA should prohibit, or at least condition, the Navy’s practice bombing activities over Sealion Rock due to the impact on seabirds, depositing of metal objects in the Sanctuary, and because the military environment does not require such a sensitive area to be used for such purposes. At the very least, NOAA should prohibit the practice bombing during the breeding season. Section 7 consultations with the Department of Commerce and the Department of the Interior should not be construed as sufficient mitigation because these processes do not address impacts to non-endangered species.

Response: NOAA agrees that the Navy practice bombing of Sealion Rock is inconsistent with the goals of the Sanctuary program. Because the permit under which the Navy conducted its activities over Sealion Rock was rescinded by the Secretary of the Interior in August, 1993, NOAA may prohibit outright all bombing activities within the Sanctuary and has determined to do so. The regulation adopted by NOAA prohibits all practice bombing and provides that no exemption from the prohibition will be granted.

Comment: NOAA does not have the authority to prohibit or condition the Navy’s activities.

Response: Because the Navy’s authorization from the Secretary of Interior was rescinded, NOAA now has the authority to not only condition but also prohibit the Navy’s practice
Comment: NOAA should place the Navy’s bombing activities within the scope of regulation to allow future regulation if necessary. To not list military activities is in conflict with the primary goal of resource protection.

Response: NOAA has addressed Navy activities in section 925.5(d) of the regulations.

Comment: NOAA should investigate the history of the Navy’s activities over Sealion Rock to determine if a grandfather clause is warranted.

Response: The history of the Navy’s activities and the permit that authorized its activities has been outlined in the FEIS/MP. The Navy’s authority to conduct practice bombing activities has been rescinded and thus consideration of a grandfather clause is irrelevant.

Comment: Clarify how Navy bombing of Sealion Rock at 200 feet is less disruptive than commercial overflights.

Response: NOAA does not assert that the Navy’s low flying activities are less disruptive than commercial or non-commercial overflights. NOAA’s differing regulations in the DEIS/MP applying to Navy and non-military overflights resulted from limitations placed on NOAA by the MPRSA with respect to terminating pre-existing leases and permits.
ISSUE: PROTECTION OF TREATY RIGHTS

Comment: NOAA's regulations do not formally recognize the Federal Government's trust responsibility to the coastal Tribes. The regulations contain no provision which formally requires the Director to consider and protect tribal interests when ruling on permit applications to conduct development activities within the Sanctuary. To address this issue, the following modifications to the section 925.8 should be made:

The Director . . . may issue a permit . . . to conduct an activity otherwise prohibited by section 925.5(a)(2)-(7), if the Director finds that the activity will: further research related to Sanctuary resources; . . . or promote the welfare of any Indian Tribe adjacent to the Sanctuary. In deciding whether to issue a permit, the Director shall consider such factors as . . . the impacts of the activity on adjacent Indian Tribes. Where the issuance or denial of a permit is requested by the governing body of an Indian Tribe, the Director shall consider and protect the interests of the Tribe to the fullest extent practicable in keeping with the purposes of the Sanctuary and his or her fiduciary duties to the Tribe . . ..

Response: NOAA agrees that the designation of the Olympic Coast National Marine Sanctuary is subject to the Federal government's general fiduciary responsibility to the coastal tribes. However, it is also clear that the Federal government is not obligated to provide particular services or benefits, nor to undertake any specific fiduciary responsibilities in the absence of a specific provision in a treaty, agreement, executive order, or statute. See Havasupai Tribe v. U.S., 752 F. Supp. 1471 (D. Ariz 1990), citing, Vigil, 667 (D.C. Cir. 1980); Gila River Pima-Maricopa Indian Community, 427 F.2d 1194, 190 Ct. Cl. 790 (1970). With respect to this designation, there is no specific provision

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in the coastal Tribes' treaties or any agreement, executive order, or statute which requires NOAA to undertake any specific fiduciary responsibility on behalf of the coastal Tribes. Therefore, NOAA can fulfill its obligations to the coastal Tribes with respect to the designation by giving due consideration to their interests and concerns during the decision-making process.

NOAA agrees that its trust responsibilities to the Tribes requires that it consider Tribal interest when ruling on permit applications to conduct activities within the Sanctuary. However, this responsibility does not require that NOAA base its decision solely on what is in the best interest of the coastal Tribes. Therefore, NOAA opposes the addition of "or promote the welfare of any Indian Tribe adjacent to the Sanctuary", but agrees to include "the effects of the activity on adjacent Indian Tribes . . . ." As previously stated, NOAA agrees that it must consider the interests of the Tribes when issuing permits, and language to that effect has been included in the regulations.

Comment: NOAA's regulation prohibiting the taking of marine mammals and seabirds conflicts with treaty rights to fish and hunt marine mammals in tribal usual and accustomed fishing grounds.

Response: NOAA recognizes that, given the standard for abrogating treaty rights enunciated by the Supreme Court in United States v. Dion, 476 U.S. 734 (1985), the provisions of the MPRSA do not abrogate the coastal Tribes' treaty fishing and
hunting rights. However, it is unclear whether Congress intended the MMPA and the Endangered Species Act (ESA) to abrogate these rights. Recently, the Makah Tribe has pursued clarification regarding the applicability of the Marine Mammal Protection Act (MMPA) and ESA to its treaty rights to hunt whales and seals. The issue is currently being examined by the Tribes and the National Marine Fisheries Service (NMFS). Given the concerns raised by the coastal Tribes, section 925.5(a)(6) has been revised to read as follows:

Taking any marine mammal, sea turtle, or seabird in or above the Sanctuary, except as authorized by the National Marine Fisheries Service or the United States Fish and Wildlife Service under the authority of the Marine Mammal Protection Act, as amended (MMPA), 16 U.S.C. 1361 et seq., the Endangered Species Act, as amended, (ESA), 16 U.S.C. 1531 et seq., and the Migratory Bird Treaty Act, as amended, (MBTA), 16 U.S.C. 703 et seq., or pursuant to any treaty with an Indian Tribe to which the United States is a party, provided that the treaty right is exercised in accordance with the MMPA, ESA, and MBTA.

The revised language recognizes the Makah Tribe's treaty right to hunt whales and seals. However, the regulation also requires that the right be exercised in accordance with the provisions of the MMPA, ESA, and MBTA. If the MMPA, ESA or MBTA is determined to abrogate or otherwise restrict the Tribe's exercise of its right to hunt whales and seals, then that determination shall apply to the Tribe's exercise of those rights within the boundary of the Sanctuary.

Comment: The regulations fail to preserve tribal control of their cultural heritage. NOAA should amend section 925.5(a)(8)
to read as follows:

Removal or attempted removal of any Indian cultural resource or artifact, or entry onto a significant cultural site designated by a Tribal governing body with the concurrence of the Director, except with the express written consent of the governing body of the Tribe or Tribes to which such resource, artifact, or cultural site pertains.

Response: The MPRSA provides NOAA with the authority to control access to cultural or historical artifacts within the Sanctuary thereby helping to ensure their preservation. Accordingly, anyone proposing to remove a cultural or historical resource must apply for and obtain a Sanctuary permit from NOAA. NOAA also acknowledges the coastal Tribes' desire to preserve their cultural heritage and, in particular, those cultural artifacts of tribal significance found within the Sanctuary. NOAA considers its objective of preserving the historical and cultural resources of the Sanctuary to be compatible with the coastal Tribes' desire to preserve their cultural heritage. Therefore, prior to issuing a Sanctuary permit to excavate a cultural or historical artifact that is of tribal significance, NOAA will consult with the affected Tribe(s). This clarification has been added to section 925.9.

Comment: The regulation prohibiting overflights under 1,000 ft. except for valid law enforcement purposes conflicts with the treaty secured rights to access certain reservation lands such as Tatoosh Island and Ozette, which are only accessible by helicopter in the winter months, and to conduct aerial timber cruises and engage in helicopter logging on portions of the
reservation abutting the Sanctuary. Therefore the following amendment to section 925.5(7) is proposed:

Flying motorized aircraft at less than 1,000 feet above the Sanctuary within one nautical mile of the coastal boundary of the Sanctuary and the Flattery Rocks, Quilleute Needles, and Copalis National Wildlife Refuges, except for valid law enforcement purposes or where authorized by a governing body of an Indian Tribe to provide access to reservation lands.

Response: NOAA acknowledges the Tribes' concerns and does not intend to interfere with tribal rights to access reservation lands. Also, for the reasons discussed below, the minimum altitude has been changed to 2000 ft. In order not to interfere with Tribal access to reservation lands, the prohibition on flying has been changed to read:

Flying motorized aircraft at less than 2,000 feet above the Sanctuary within one nautical mile of the Flattery Rocks, Quillayute Needles, or Copalis National Wildlife Refuge, and within one nautical mile seaward from the coastal boundary of the Sanctuary, except as necessary for valid law enforcement purposes, for activities related to tribal timber operations conducted on reservation lands, or to transport persons or supplies to or from reservation lands as authorized by a governing body of an Indian Tribe.

Comment: NOAA should apply the management plan equally to tribal and non-tribal governmental entities within the adopted boundary equally.

Response: NOAA is legally bound to recognize treaty secured rights and has no intention to interfere with these rights. As such, there will be circumstances in which Sanctuary regulations will apply to tribal and non-tribal members differently.
**ISSUE: VESSEL TRAFFIC**

**Comment:** Route tankers and barges as far away from near-shore reefs and islands as possible. Clarify what types of vessels can transit close to shore.

**Response:** There exists a Cooperative Vessel Traffic Management System (CVTMS) established and jointly managed by the United States and Canada. The CVTMS is a mandatory regime and consists of all navigable waters of the Strait of Juan de Fuca and its offshore approaches, southern Georgia Strait, the Gulf and San Juan Archipelagos, Rosario Strait, Boundary Pass, Haro Strait, and Puget Sound, bounded on the west by longitude 147°W and latitude 48°N, and on the northeast by a line along 49°N from Vancouver Island to Semiamoo Bay.

The rules of the CVTMS are intended to enhance safe and expeditious vessel traffic movement, to prevent groundings and collisions, and to minimize the risk of property damage and pollution to the marine environment. The rules apply to:

a. Each vessel of 30 meters or more in length; and

b. Each vessel that is engaged in towing alongside or astern, or in pushing ahead, one or more objects, other than fishing gear, where:

(1) the combined length of the vessel towing, the towing apparatus, and the vessel or object towed is 45 meters or more; or

(2) the vessel or object towed is 20 meters or more in overall length.
Both the Canadian and the United States Coast Guards are studying methods to improve the CVTMS in the area. Items being studied include replacement of outdated equipment, elimination of gaps in coverage, and increasing operator training and assignment length.

The Oil Pollution Act of 1990 (OPA 90) requires the U.S. Coast Guard to conduct a national Tanker Free Zone Study. This study is nearing completion and will recommend regulations requiring tank vessels to remain offshore during coastal transits.

Further, NOAA has recommended to the U.S. Coast Guard that an International Maritime Organization (IMO) approved ATBA be established within the proposed Sanctuary boundary. This would require vessels transporting hazardous materials to remain at least 25 nautical miles offshore while in the vicinity of Sanctuary waters or until making their approach to the Strait of Juan de Fuca using the established CVTMS traffic separation scheme. Although ATBA's are not compulsory for foreign flag vessels, a maritime state may make such an area compulsory for domestic vessels transiting the waters under its jurisdiction.

Comment: Clarify "commercial vessel" and distinguish between various sizes, uses, and types of vessels.

Response: "Commercial vessel" means any vessel operating in return for payment or other type of compensation. Clarification between sizes, uses, and types of vessels would require more
space than is available in this document. Rather than attempt to hold to a general definition of "commercial vessel", reference will be made to specific types of vessels, i.e., tank vessels, bulk carriers, fishing vessels, pleasure craft, etc., wherever required.

Comment: The Sanctuary boundary should be published on navigational charts.

Response: NOAA agrees and will submit the Sanctuary boundary to the Nautical Charting Division of the National Ocean Service. The boundary will be delineated on the next update of the appropriate navigational chart.

Comment: Spill containment and cleanup measures should be part of appropriate mitigation requirements for vessels operating within the Sanctuary.

Response: OPA 90 mandates that tank vessel contingency plans be prepared for a worst-case discharge, and that vessel plans be reviewed and approved by the U.S. Coast Guard. OPA 90 also stipulates that each responsible party for a vessel from which oil is discharged, or which poses the substantial threat of a discharge of oil into or upon the navigable waters or adjoining shorelines or the exclusive economic zone, is liable for the removal costs and damages resulting from such an incident.

Further, Washington State law (Title 88 Section 46 Revised Code of Washington) requires the owner or operator of a tank
vessel to prepare and submit an oil spill prevention plan prior to the vessel's entry into a Washington port. The law also requires that each tank vessel, cargo vessel of greater than three hundred or more gross tons, or passenger vessel of greater than three hundred or more gross tons have a contingency plan for the containment and cleanup of oil spills from such vessel into the waters of the State.

Comment: NOAA should provide a more complete explanation of how implementation of each of the regulations would put U.S. shipping companies at an economic disadvantage in relation to foreign vessels. Precisely what would be the estimated cost in dollars, time, inconvenience, and ultimate impact upon U.S. shipping companies.

Response: NOAA is promulgating no regulations that will adversely affect domestic vessels.

Comment: NOAA should put forth a vessel traffic management plan, spearheaded by the U.S. Coast Guard, that addresses research needs, vessel traffic monitoring and communication systems, and future regulatory alternatives. The management plan should be proactive, and establish a timetable for considering new vessel traffic regulations in the future.

Response: NOAA is working with the U.S. Coast Guard, which has the primary authority for vessel traffic regulation, to determine the need for additional measures to ensure protection.
of Sanctuary resources and qualities. In addition, NOAA will work with the U.S. Army Corps of Engineers (COE) and the EPA regarding vessel traffic activities resulting from the transport of dredged material through the Sanctuary for disposal outside the Sanctuary. These consultations will aim to determine which resources are most at risk, which vessel traffic practices are most threatening, and which regulations or restrictions would be most appropriate to alleviate such risk.

NOAA agrees that an improved vessel traffic monitoring and communication system along the coast is desirable. OPA 90 requires the Secretary of Transportation to complete a comprehensive study on the impact of installation, expansion, or improvement of vessel traffic servicing systems. NOAA will work with the State of Washington’s OMS, the U.S. Coast Guard, and appropriate public agencies during the development of these monitoring studies to determine an appropriate system for the Sanctuary and the need for any additional site-specific protective measures.

Vessel traffic monitoring and research and coordination on this subject have been incorporated into the Sanctuary management plan.

Comment: Allow only double-hulled vessels in the Sanctuary.

Response: OPA 90 establishes double hull requirements for tank vessels. Most tank vessels over 5,000 gross tons will be required to have double hulls by 2010. Vessels under 5,000 gross
tons will be required to have a double hull or a double containment system by 2015. All newly constructed tankers must have a double hull (or double containment system if under 5,000 gross tons), while existing vessels are phased out over a period of years.

As previously stated, the U.S. Coast Guard is completing a study of a tanker free zone where tank vessels would be required to remain offshore during coastal transits. Further, a proposal to establish an ATBA within the Sanctuary boundary has been developed and will be submitted to the International Maritime Organization (IMO) for approval at the earliest possible date which, in accordance with IMO's procedures, is June, 1994. Both actions will serve to ensure that hazardous material laden vessels will remain an appropriate distance offshore.

Comment: Require vessels to have a pilot aboard.

Response: Requirements for pilots are set forth in both Federal and state regulations. NOAA will monitor and review vessel traffic in the Sanctuary and make recommendations to the appropriate regulatory agencies, state and Federal, regarding the need for additional pilotage requirements. Pilotage is currently compulsory for all vessels except those under enrollment or engaged exclusively in the coasting trade on the West Coast of the continental United States (including Alaska) and/or British Columbia. Port Angeles has been designated as the pilotage station for all vessels enroute to or from the sea.
OPA 90 requires the U.S. Coast Guard to designate U.S. waters where a second licensed officer must be on the bridge of a coastwise seagoing tanker over 1,600 gross tons. Under the Ports and Waterways Safety Act, the U.S. Coast Guard also is proposing to require a second officer on foreign flag tankers over 1,600 gross tons and on U.S. registered tankers over 1,600 gross tons.

Comment: Establish a tonnage limit within three nautical miles of shore except for those making a port call.

Response: All types of vessels and traffic patterns will be reviewed by NOAA, the U.S. Coast Guard, and the State of Washington OMS to determine any appropriate action to be taken. In conducting this review, attention will be paid to vessel type, cargo carried, and vessel size.

Comment: Require all vessels to have English speaking bridge personnel.

Response: All vessels required to participate in the Juan de Fuca region CVTMS are required to make all reports in English.

Comment: Curtail traffic during poor weather conditions.

Response: NOAA will work with the state, U.S. Coast Guard, and appropriate public agencies to determine the need for further vessel traffic regulations to specifically address vessel traffic during adverse weather conditions.

During conditions of vessel congestion, adverse weather,
reduced visibility, or other hazardous circumstances in the area of the Juan de Fuca Region CVTMS, the Cooperative Vessel Traffic Management Center may issue directions to control and supervise traffic. They may also specify times when vessels may enter, move within or through, or depart from ports, harbors, or other waters of the CVTMS Zone.

Further, the U.S. Coast Guard's Navigation Rules, International and Inland, speak specifically to the conduct of vessels while at sea. Rule 6 of the International and Inland Steering and Sailing Rules states that "Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions."

Comment: Prohibit engine powered water craft of any type.

Response: A fundamental objective of the sanctuary program is "to facilitate, to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities" (16 U.S.C. 1431(b)(5)). NOAA will consider the threats from all types of vessels - power driven, sailing, or paddle propelled - as a continuing analysis of vessel traffic within the sanctuary boundaries.

Comment: Manage the off-loading or exchange of cargo or oil.
Response: No offloading or exchange of oil occurs within the boundary of the Sanctuary. This activity generally occurs in ports which are located outside of the Sanctuary boundary. Further, this type of activity is addressed by both OPA 90 and programs being established by the recently created Washington State OMS.

Comment: Prohibit shipment of reclaimed spent nuclear fuel from foreign reactors through the Sanctuary.

Response: As previously noted, NOAA has recommended to the U.S. Coast Guard that an IMO approved ATBA be established within the Sanctuary boundary. This would require vessels transporting hazardous materials to remain at least 25 nautical miles offshore while in the vicinity of Sanctuary waters or until making their approach to the Strait of Juan de Fuca using the established CVTMS traffic separation scheme.

NOAA will also work with the State of Washington's OMS and both the U.S. and Canadian Coast Guards to be informed of, and alerted to, in a timely and regular manner, all hazardous cargo carriers transiting near Sanctuary waters. Further, through participation in regular meetings of the Washington State Regional Marine Safety Committees and discussions with the U.S. Coast Guard, NOAA will ensure that contingency plans adequately address such transport issues.

Comment: Prohibit commercial vessel anchorages within the
Sanctuary, particularly off Makah Bay, except in emergencies.

Response: The use of the Makah Bay anchorage by vessels waiting either for an available pilot at Port Angeles or instructions from their home office, has been examined. Currently, its use as a temporary anchorage has been agreed upon by both the U.S. and Canadian Coast Guards. This is viewed as a more favorable alternative than having such vessels continuously underway within, and off the entrances to, the Strait. Vessels at anchor are subject to MARPOL, U.S. Federal law, and Sanctuary regulations regarding discharges. The use of this anchorage is monitored by Tofino Vessel Traffic Service which can also educate such vessels regarding the Sanctuary and its regulations.

Comment: Clarify NOAA’s authority to regulate vessel traffic within State of Washington waters.

Response: Section 303 of the MPRSA gives NOAA the authority to promulgate regulations to implement the designation, including regulations necessary to achieve resource protection.

Comment: The State and Federal government have appropriated $75 million to expand and enhance maritime activity at Grays Harbor through waterway dredging and port terminal development programs. If vessel traffic is restricted, one branch of the government would be defeating the purpose of other parts of the government.

Response: NOAA has studied vessel traffic along the Washington coast. The result of the analysis was the
recommendation for the previously mentioned ATBA. This proposal, if adopted, would add approximately 17 nautical miles on a transit from Grays Harbor to the entrance of the Straits of Juan de Fuca and approximately 21 nautical miles on a transit from the entrance of the Straits to Grays Harbor. In comparison to the costs of cleanup, legal fees, liability, fines, loss of cargo, and vessel and environmental damages, the proposals to establish the ATBA seem reasonable.

Comment: Double-hulled proposals are not economically sensible in the foreseeable future.

Response: Congress has mandated (OPA 90) national double hull requirements for tank vessels.

ISSUE: OVERFLIGHTS

Comment: Establish the boundary for overflights at the beach rather than one (1) mile inland.

Response: The boundary for overflights is at the shoreline and not one (1) mile inland.

Comment: Establish a 2,500 foot minimum flight altitude over the sanctuary.

Response: To be consonant with current regulations regarding flights over charted National Park Service Areas, U.S. Fish and Wildlife Service Areas, and U.S. Forest Service Areas, NOAA is prohibiting the flying of motorized
aircraft at less than 2,000 feet above the Sanctuary within one nautical mile of the Flattery Rocks, Quillayute Needles, or Copalis National Wildlife Refuge, and at less than 2,000 feet above the Sanctuary within one nautical mile seaward from the coastal boundary of the Sanctuary, except as necessary for valid law enforcement purposes, for activities related to tribal timber operations conducted on reservation lands, or to transport persons or supplies to or from reservation lands as authorized by a governing body of an Indian Tribe. NOAA will work with the Federal Aviation Administration (FAA) to reflect this regulation on aeronautical charts.

Comment: Permit search and rescue at all times by whatever aircraft is needed to accomplish the task.

Response: The prohibitions set forth in the Sanctuary regulations do not apply to activities necessary to respond to emergencies threatening life, property, or the environment pursuant to Section 925.5 (c) of the regulations. Thus, in any emergency, search and rescue aircraft are allowed to perform whatever tasks are required within the Sanctuary boundary.

Comment: When necessary to bring a research flight into the area below the Sanctuary prescribed ceiling, regulations should require the plane's engine be kept at or below a
reasonable decibel level as heard from the ground.

Response: FAA regulations (14 CFR Part 36) codify noise standards for aircraft operating within U.S. airspace. Adherence to these standards is already required. When research is to be conducted within the Sanctuary boundary, aircraft operators will be required to obtain a permit and conduct such research in such a manner so as to minimize disturbance yet remain within safe aircraft operating parameters.

ISSUE: LIVING RESOURCE EXTRACTION

Fishing

Comment: NOAA should not restrict access to fishing grounds or catch-ability. Crab fishing and razor clam digging must be allowed.

Response: The regulation of fishing is not authorized by the Designation Document. NOAA has determined that existing fishery management authorities are adequate to address fishery resource issues. As with all other fisheries that occur within the Sanctuary, crab fishing and razor clam digging remain under the regulatory authority of existing Federal, state, tribal and regional fishery authorities. NOAA does not view fishing as contrary to the goals of the Sanctuary. The sanctuary program is by law mandated "to facilitate to the extent compatible with the primary objective of resource protection, all public and
private uses of the resources "(including fishing) (16 U.S.C. 1431(b)(5)).

Existing fishery management agencies are primarily concerned with the regulation and management of fish stocks for a healthy fishery. In contrast, the National Marine Sanctuary Program has a different and broader mandate under the MPRSA to protect all Sanctuary resources on an ecosystem-wide basis. Thus, while fishery agencies may be concerned about certain fishing efforts and techniques in relation to fish stock abundance and distribution, the Marine Sanctuary Program is also concerned about the potential incidental impacts of specific fishery techniques on all Sanctuary resources including benthic habitats or marine mammals as well as the role the target species plays in the health of the ecosystem. In the case of the Olympic Coast, fish resources are already extensively managed by existing authorities and NOAA does not envision a fishery management role for the Sanctuary Program. Accordingly, fishing activities have not been included in the list of activities in the Designation Document subject to regulation as part of the Sanctuary regime. However, the Sanctuary Program will provide research results and recommendations to existing fishery management agencies in order to enhance the protection of fishery and other resources within the Sanctuary.
Comment: No additional fisheries management or regulation is needed in the Sanctuary. Commercial, recreation, and subsistence fishing can be compatible with sanctuary designation, and the existing regulatory framework is adequate at this time.

Response: See response to previous comment. The Designation Document places kelp harvesting within the scope of future regulation since there is no existing management plan for kelp harvesting.

Comment: Clarify the language associated with commercial fishing practices near sunken vessels, rocks and reefs in the proposed sanctuary to insure continuance of historical and customary fishing practices. Existing Federal and state regulations adequately protect archeological treasures, man-made reefs, and natural rock and reef formations. The FEIS should acknowledge and permit prevailing practices.

Response: Commercial fishing vis-a-vis historical resources is an exempted activity under the prohibition against disturbance of historical resources. However, the exemption is only for incidental disturbance and therefore does not allow deliberate disturbance.

Comment: Fishing should either be regulated, or placed in the scope of regulation, because there may be a time in the future when fishing needs to be regulated by the Sanctuary.
Response: NOAA believes that existing authorities are adequate to regulate fishing. Should the need arise to regulate fishing as part of the Sanctuary management regime, the Designation Document could be amended.

Comment: Proposed regulations should result in the gradual reduction of fishing, aquaculture, kelp harvesting and waterfowl hunting to insure that no commercial activity threatens the integrity of any resources in the proposed Sanctuary. Some commenters believed that the Sanctuary should ban all commercial fishing activities except Native American fishing activities.

Response: A blanket reduction of resource-use activities across the Sanctuary could not be imposed without credible evidence that each resource affected is threatened by a population decrease or stock failure. Absent such evidence, the Act requires that existing uses be facilitated to the extent compatible with the primary objective of resource protection.

Comment: True refugia should be established where all consumptive uses are prohibited for a period of time.

Response: The determination of whether refugia are established in the Sanctuary will be done in coordination with the NMFS, PFMC, Washington Department of Fisheries (WDF), the tribes, environmental groups, and industry. The
Sanctuary Advisory Committee (SAC) will be an important forum to address this issue. If, in coordination with other governmental agencies, it is determined that establishment of refugia is a desirable alternative, NOAA will analyze the alternative through the preparation of an environmental impact statement/management plan and solicitation of public input pursuant to the NEPA and the APA.

Comment: Driftnets, trawling, and all dragnet fisheries should be banned from the proposed Sanctuary as inconsistent with the regulation prohibiting alteration of, or construction on, the seabed.

Response: The only net gear used in fisheries in the Sanctuary are trolling gear (for salmon) and trawling gear (for groundfish). The regulatory prohibition on altering the seabed includes an exception for incidental disturbance resulting from traditional fishing operations. NMFS has conducted a limited study of the impact of trawl gear on the benthos and has not identified any resulting systematic destruction. However, the regulations could be modified to regulate any activity that is shown to cause significant disturbance of the seabed. This reflects adherence to the MPRSA's goals of preserving natural and human-use qualities of a marine area.

High-seas driftnets, defined as nets greater than 1.5 miles long, have been banned pursuant to United Nations
resolution 46/215. While gillnets and setnets are currently used in the inland waters of the State of Washington, they are not used in Sanctuary waters.

Comment: NOAA should facilitate the regulation of resource extraction within the Sanctuary under a regulatory framework that is controlled by a single agency.

Response: Regulatory authority over resources and resource extraction industries is expressly granted by state and Federal statute. NOAA does not have the primary regulatory authority over resource extraction. NOAA can act to coordinate the various regulators and can impose additional regulations, but cannot reassign itself or other agencies regulatory authority.

Comment: NOAA must clarify and acknowledge all tribal treaty fishing rights in the FEIS/MP, and the interaction of Sanctuary regulations with the right of tribes to fish in their Usual and Accustomed fishing areas.

Response: This issue is clarified in the Designation Document and in Part II (under Socio-Demographic profile and Land Use). Treaty rights to hunt and fish are acknowledged.

Comment: The entire study area must be considered as a "fishing area" since fish migrate along the entire Washington coast.
Response: NOAA recognizes that fish "know no boundaries in the sea." The fishing areas identified in the FEIS/MP only represent known locations where certain fishery activity is concentrated. The fishing areas displayed in the FEIS/MP are not related to regulatory jurisdiction in any way. They are simplified visual aids to complement the discussion of resources off the coast of Washington.

Aquaculture

Comment: Clarify NOAA's intention to regulate, condition, or prohibit aquaculture activities throughout the Sanctuary and adjacent to Indian reservations.

Response: The Sanctuary regulations do not directly prohibit aquaculture operations within the Sanctuary boundary. However, discharge of matter into the Sanctuary, or alteration of or construction on the seabed in connection with aquaculture activities are prohibited. It is unlikely that permits would be granted for aquaculture activities in the Sanctuary that violate these prohibitions. This determination is based upon U.S. Army Corps of Engineers (COE) guidance related to permits for fish pen mariculture operations, which prohibits fish farms in Federal natural resource areas, such as national seashores, wilderness areas, wildlife refuges, parks or other areas designated for similar purposes (e.g., national marine sanctuaries).

Comment: NOAA should change the proposed regulation
governing alteration of or construction on the seabed to "maintenance and development of approved aquaculture operations", and strike "existing prior to the effective date of these regulations." Eliminating future aquaculture development off the Olympic Coast would preclude opportunities for both private shellfish and finfish production and for public enhancement. Technology is being developed which would result in minimal environmental imbalance, and would afford employment for regional communities.

Response: See response to previous comment.

Comment: The Sanctuary should not regulate aquaculture activities because there are sufficient regulations in place.

Response: See response to previous comment.

Comment: The Sanctuary should provide mutually agreed upon requirements for aquaculture activities among the oyster growers of Willapa Bay.

Response: The boundary of the Sanctuary does not include Willapa Bay.

Comment: The discussion in the FEIS/MP on the impacts of aquaculture needs to be expanded and the proposal to not regulate aquaculture in the Sanctuary should be re-assessed.
The FEIS/MP needs to address the use of drugs in farm-raised fish.

Response: The discussion of aquaculture within the Sanctuary is intended only to evaluate the current status of the industry in the study area - it is not intended to measure aggregate impacts. The request for expanded discussion of resources does not identify specific issues of discussion. A re-assessment of aquaculture vis-a-vis the Sanctuary reveals that the industry is adequately regulated by existing state and Federal requirements. However, any discharges from such operations into the Sanctuary would be prohibited. The Sanctuary has no jurisdiction over the use of drugs in aquaculture - such determinations are under the purview of the Washington State Department of Health (WDH) and the Federal Food and Drug Administration (FDA).

Comment: All aquaculture should be banned from within the Sanctuary.

Response: The Sanctuary is required by law to facilitate public and private uses of Sanctuary resources as long as resource protection is not jeopardized. If properly sited and operated, aquaculture does not appear to appreciably impact the health of the marine environment.

Comment: Kelp harvesting should be banned or regulated within the Sanctuary.

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Response: At present there is no kelp harvesting within the Sanctuary. The Washington Department of Natural Resources (DNR) is in the process of preparing a management plan for kelp harvesting. NOAA has included kelp harvesting in the scope of regulations in the Designation Document in the event that future action by NOAA is necessary to protect this resource. NOAA will work with DNR to develop a kelp management plan within the Sanctuary.

ISSUE: MARINE MAMMALS, SEA TURTLES AND SEABIRDS

Comment: Clarify "takings". The prohibition on the taking of marine mammals and seabirds within the Sanctuary is redundant with the ESA, the MMPA and the MBTA, and what further impact it will have on the fishing community.

Response: "Taking" is defined in section 125.3 of the regulations to mean: (1) for any marine mammal, sea turtle or seabird listed as either endangered or threatened pursuant to the ESA to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect or injure, or to attempt to engage in any such conduct and, (2) for any other marine mammal, sea turtle, or seabird, the term means to harass, hunt, capture, kill, collect or injure, or to attempt to engage in any such conduct. While marine mammals, seabirds and endangered and threatened species are protected under the MMPA, ESA and MBTA, NOAA believes that the higher penalties afforded under the MPRSA will provide a stronger
deterrent.

The MBTA sets maximum criminal fines at either $500 or $2,000 per violation, depending on the violation. The MMPA sets maximum civil penalties at $10,000 and maximum criminal fines at $20,000. The ESA sets maximum civil penalties at $500, $12,000 or $25,000 per violation, depending on the violation; maximum criminal fines are set at $50,000. (All three statutes also provide for imprisonment for criminal violations.)

Section 307 of the MPRSA allows NOAA to assess civil penalties as high as $100,000 for each violation. In addition, monies collected under the MPRSA are available for use by the National Marine Sanctuary Program.

Comment: The MBTA would not allow any taking of migratory birds in the sanctuary, thus providing even stronger prohibition than sanctuary status can provide.

Response: See above response. Section 925.5(a)(6) of the Sanctuary regulations prohibits the taking of migratory birds within the Sanctuary. Including a prohibition on "taking" marine birds in the Sanctuary regulations allows such violations to be subject to the civil penalties authorized by the MPRSA which far exceed those authorized by the MBTA.

Comment: Prohibit all takings of marine mammals and
seabirds, regardless of military or fishing exemptions.

Response: Section 925.5(a)(6) of the Sanctuary regulations prohibits the taking of marine mammals and seabirds in or above the Sanctuary except as authorized by the NMFS or the United States Fish and Wildlife Service under the authority of the MMPA, as amended, 16 U.S.C. 1361 et seq., the ESA, as amended, 16 U.S.C. 1531 et seq., and the MBTA, as amended, 16 U.S.C. 703 et seq., or pursuant to any treaty with an Indian tribe to which the United States is a party, provided that the treaty right is exercised in accordance with the MMPA, ESA, and MBTA. Exemptions include a limited five-year incidental take of marine mammals provided by interim regulations promulgated pursuant to the MMPA, which are in effect until October, 1993. The ESA also has a limited incidental take exemption. See 15 U.S.C. section 1539(a)(2)B(i). NMFS, in conjunction with environmental groups and the fishing industry, is developing a permanent management regime to be implemented upon expiration of the MMPA interim regulations.

If in the future NOAA determines that the existing regulations promulgated under MMPA, ESA, MBTA or any other state or Federal statute are not adequate to ensure the coordinated and comprehensive management of marine mammals and seabirds, changes to the Sanctuary regulations would be undertaken in accordance with the requirements of the MPRSA, NEPA and APA.
Comment: Exclude from [takings] prohibition birds considered game.

Response: The only birds section 925.5(a)(6) prohibits the taking of are seabirds--seabirds are not considered game species.

Comment: Section 925.5(a)(6) of the proposed regulations would prohibit the taking of marine mammals or seabirds unless affirmatively permitted by regulations promulgated under authority of the ESA, MMPA, or MBTA. Because these regulations do not expressly permit any takings by treaty Indians, the proposed sanctuary regulations would effectively prohibit the Makah Tribe from exercising their treaty rights to take marine mammals. The proposed regulations would also hinder the tribe's ability to exercise its fishing rights by precluding fisheries which result in the incidental taking of marine mammals and seabirds.

The DEIS/MP offers no conservation justification for imposing restrictions on the taking of marine mammals and seabirds which go beyond the restrictions imposed by the ESA and MMPA. The DEIS/MP concedes that the purpose of the proposed sanctuary regulations is not to protect particular species from extinction. According to the DEIS, the purpose of these additional prohibitions in the proposed regulations is to "extend protection for sanctuary resources on an
environmentally holistic basis." This goal does not permit infringement of treaty rights. Therefore, the regulations should be amended by adding "or in accordance with any treaty to which the United States is a party."

Response: The regulatory prohibitions do not abrogate or obstruct any rights under an existing treaty. The regulations have been changed by adding "or pursuant to any treaty with an Indian tribe to which the United States is a party, provided that the treaty right is exercised in accordance with the MMPA, ESA and MBTA." The treaty between the Makah Tribe and the United States explicitly assures the "right of taking fish and of whaling or sealing at usual accustomed grounds and stations." (Article 4, Treaty of Neah Bay, 1855).

Incidental takes of marine mammals can legally occur under permit and exemption provisions of the MMPA. Currently, Washington coastal tribes apply for and receive exemption certificates from NMFS for the incidental taking of marine mammals during fishing. Fees for this exemption are waived for tribes.

Further, tribes cannot be denied entry into any fishery based on the likelihood or occurrence of seabird or marine mammal takings. However, they could be prosecuted if they violate the ESA, MMPA, or MBTA.

Comment: Change the wording of the regulation to read "as
authorized or permitted by NMFS or [the U.S. Fish and Wildlife Service] USFWS under the authority of the MMPA and ESA." NMFS suggests that the preamble and/or regulations clarify that Sanctuary permits will not be required for activities authorized or permitted by NMFS or USFWS under MMPA or ESA. Such clarification would relieve many concerns over the possibility of overlapping and potentially duplicative permitting requirements.

Response: NOAA has amended the regulation by adding "as authorized by the National Marine Fisheries Service or the United States Fish and Wildlife Service under the authority of the Marine Mammal Protection Act, as amended, (MMPA), 16 U.S.C. 1361 et seq., the Endangered Species Act, as amended, (ESA), 16 U.S.C. 1531 et seq., and the Migratory Bird Treaty Act, as amended, (MBTA), 16 U.S.C. 703 et seq. . . . ." The inclusion of "as authorized or permitted" is viewed by NOAA as redundant.

ISSUE: SANCTUARY ADMINISTRATION

Regulations/Permits

Comment: NOAA should use economic incentives rather than regulations to ensure that activities do not impact resources.

Response: NOAA does not have sufficient authority to provide economic incentives to ensure that activities do not impact Sanctuary resources. Even regulations, which include

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economic disincentives such as monetary penalties, are not sufficient to ensure that any activity does not impact resources.

Comment: Clarify the statement: "When a conflict with a sanctuary regulation related to specific [non-sanctuary] regulations occurs, the one more protective of sanctuary resources will prevail." NOAA regulations should not override those of the local jurisdictions. NOAA needs to clarify: 1) the application of this policy to fishing; 2) types of conflicts the statement applies to; 3) who determines whether a conflict exists; and 4) the process for resolving a conflict.

Response: NOAA agrees that the statement as written in the DEIS/MP is unclear. Accordingly, the statement has been deleted in the FEIS/MP. Essentially, the statement meant that if two regulations exist covering an activity in the Sanctuary, one promulgated by NOAA under the MFRSA authority and the other by another agency under a different statute, compliance with the less restrictive regulation will not relieve the obligation to comply with the other more restrictive one.

Comment: NOAA should follow the guidelines of NEPA when proposing any change in regulations that are listed in the scope of regulations. This is especially applicable to
vessel traffic and discharge regulations. Also, clarification is needed on the rulemaking and amendment processes.

**Response:** Listing activities in the scope of regulation reflects that the issues and alternatives were addressed in the FEIS/MP, public hearings were held, and public comments were solicited regarding the activities. If NOAA later proposes the regulation of an activity listed in the scope of regulations in the Designation Document but not regulated at the time of Sanctuary designation, NOAA will request public comments on the proposal. When NOAA plans to amend a rule that has been promulgated, an analysis of the issues, affected environment, alternatives and consequences will be completed and public comments solicited. NOAA will then modify the proposal if necessary and respond to public comments when taking the final action.

**Comment:** A procedure must be established to disagree with management and issue an appeal if permits to conduct research are denied.

**Response:** Section 925.12 of the Sanctuary regulations set forth the procedures for appealing denials of Sanctuary permits. The appeal process involves a written statement by the appellant to the Assistant Administrator of NOAA. The Assistant Administrator may conduct a hearing on the appeal.
Comment: Clarify the procedure for obtaining permits for low-flying aircraft engaged in ongoing species monitoring studies and damage assessment studies in response to an incident such as an oil spill. Activities authorized by the NMFS and USFWS should not require a Sanctuary permit because the requirements for permits would be duplicative.

Response: All flights engaged in monitoring or research activities that fly below 2,000 feet are required to obtain a Sanctuary permit, or, if the activity is already pursuant to a permit, to have that permit certified. Permits are not required for overflights necessary to respond to emergencies threatening life, property or the environment.

Comment: NOAA should not grandfather existing uses if otherwise prohibited by sanctuary regulations.

Response: Section 304(c)(1)(B) of the MPRSA specifies that NOAA may not terminate any valid lease, permit, license, or right of subsistence use or of access, if the lease, permit, license, or right "is in existence on the date of designation of any national marine sanctuary. . . . ."

Comment: Treaty secured rights should not require sanctuary certification and registration. Further, NOAA should obligate federal regulators to consider and protect tribal interests when issuing permits which may affect those
interests.

Response: Treaty secured rights do not require certification by the Sanctuary program.

Comment: The regulations, exemptions and authority to place conditions on existing permitted activities are unclear.

Response: Section 304(c)(2) of the MPRSA provides NOAA with the right to regulate the exercise of a lease, permit, license, or right of subsistence use or of access existing on the effective date of Sanctuary designation.

Comment: Sanctuary management should be formally coordinated with tribal regulatory and law enforcement authorities through cooperative agreements.

Response: Cooperative agreements will be developed as necessary between NOAA and the tribes regarding regulatory and law enforcement activities.

Comment: The Sanctuary should offer increased enforcement which should be conducted by Sanctuary personnel rather than the U.S. Coast Guard. Clarify the enforcement procedures.

Response: There will be enforcement of Sanctuary regulations through cooperative agreements with the U.S. Coast Guard, NMFS, WDF, the coastal tribes, USFWS, and the National Park Service (NPS). Considering fiscal constraints, level of use, and availability of enforcement
personnel working in the field already, NOAA has determined that it is not a high immediate priority to hire Sanctuary enforcement personnel. The Sanctuary must first become fully staffed and operational, and a determination must be made whether additional enforcement personnel are needed. The enforcement procedures will be determined pursuant to the cooperative agreements that are established.

Comment: The broad scope of the discharge prohibition will require a well-coordinated enforcement operation to monitor all discharge and disposal activities from sources on land as well as in offshore, coastal and inland waters over large areas outside of the Sanctuary boundary. It may be impossible to determine the origin of discharges or deposits found in the Sanctuary after the dumping activity has occurred.

Response: The prohibition on discharges from outside the boundary relates to discharges that enter and injure Sanctuary resources. NOAA must establish that discharges not only enter, but injure the resources before enforcement actions will be taken. It will, therefore be desirable for NOAA to undertake a comprehensive monitoring program by which it can determine ecosystem health and use impacts.

Comment: NOAA should impose unlimited liability for spills extended to shipping companies and firms providing original
source materials involved in polluting activities.

**Response:** NOAA is permitted to seek penalties of up to $100,000 per day for a violation pursuant to Section 307(c)(1) of the MPRSA (16 U.S.C. 1437(c)(1)), and for natural resource damages pursuant to section 312 of the MPRSA (16 U.S.C. 1443).

**Transboundary Coordination**

**Comment:** NOAA should coordinate with other Federal and Canadian authorities to regulate vessel traffic, reduce the risk of oil spills, and eliminate oil and gas drilling in Canadian waters adjacent to the proposed sanctuary. NOAA should encourage an adjacent sanctuary along the west coast of Vancouver Island.

**Response:** NOAA agrees and is working with the Canadian Coast Guard, the U.S. Coast Guard and the Washington OMS to reduce the risk of oil spills. The regulation of vessel traffic will currently remain with the U.S. and Canadian Coast Guards and the OMS. NOAA will support any Canadian initiative to designate a marine protected area in Canadian waters on the Pacific Coast.

**Beach Management Policies**

**Comment:** NOAA should grandfather in the existing beach management policies including allowable beach driving activities.

**Response:** The boundary of the Sanctuary does not encompass beaches where beach driving is permitted.
Advisory Committee/Decision Making

Comment: NOAA and the State of Washington should work together to determine the composition of the Sanctuary Advisory Committee (SAC). The SAC should include representatives from private landowners, local industry, the county and tribes. The SAC should be based at the local level to oversee operations and help maintain strong local input.

Response: NOAA will work with local user and interest groups and state and local governments to obtain broad representation on the SAC. The law limits the SAC to no more than 15 members.

Comment: The SAC should have the power to direct the Sanctuary manager and set priorities for funding. The SAC decisions should be binding. If the decisions are not binding, then the manager should at least provide a rationale for any actions taken which are directly contrary to the recommendations of the SAC.

Response: The SAC recommendations to the manager will be instrumental in guiding the manager with respect to prioritizing actions. If the manager chooses not to pursue the recommendations of the SAC, a rationale will be provided to the members of the SAC.

Comment: One of the first tasks of the SAC should be to
review and update the State of Washington's coastal zone management program to ensure consistency with the Sanctuary management plan. The Sanctuary management plan goals and objectives should also be reviewed.

Response: Prior to designation, the State of Washington will review the FEIS/MP as part of its consistency determination as it relates to Washington's approved coastal zone management program. The WDOE has jurisdiction for the Shoreline Management Act. The SAC will not share that jurisdiction, rather, the SAC will be responsible for reviewing the Sanctuary management plan goals and objectives. The SAC's first priority will be to help determine the five-year Sanctuary operating plan establishing priorities for education, research, monitoring, facilities siting and administration.

Miscellaneous

Comment: Firearms should be controlled or banned within the Sanctuary.

Response: Possession and use of firearms is regulated by State law for public safety purposes. The primary purpose of Sanctuary designation is resource protection.

Management Alternatives/Strategies

Comment: The administrative models being discussed in the Northwest Straits proposal should be considered.

Response: The administrative model identifying NOAA as the lead agency in managing the sanctuary with guidance and assistance from the SAC (which will represent State and local
interests) will be implemented in the Olympic Coast National Marine Sanctuary. The administrative model which involves joint administration between NOAA and the State of Washington was not considered for the Olympic Coast National Marine Sanctuary because the Sanctuary is predominately in Federal waters. One model suggested for the proposed Northwest Straits National Marine Sanctuary focuses on joint administration because the Sanctuary would be located entirely within State waters. NOAA will work closely with the state and counties and other Federal agencies in the administration of the Olympic Coast National Marine Sanctuary.

Comment: The management plan needs to account for tribal sovereignty and jurisdiction with respect to cultural resources, law enforcement and research practices. NOAA needs to recognize the need to coordinate with each tribal entity in the same manner as with the state and its management agencies.

Response: NOAA acknowledges the importance of tribal sovereignty. Nothing in the designation will impact the treaty rights of the coastal tribes. NOAA will consult closely with the tribes on any action that may potentially impact tribal rights or interests.

Comment: NOAA should choose management plan alternative 1 which proposes to gradually phase in program activities and staffing. Staff could be co-located with another Federal agency in Port
Angeles, with satellite sites in Klaloch or La Push. National concerns with fiscal restraint support this choice.

Some commenters supported management plan alternative 2 which proposes to set up the sanctuary headquarters and immediately provide full-staffing. Sanctuary headquarters should be located on the coast. The former Makah Air Force Station is one possible location.

Response: NOAA is experiencing the fiscal constraints that all Federal programs are experiencing. NOAA proposes to balance the needs for resource protection and fiscal restraint by phasing in staffing and maximizing cooperative relationships with other agencies and jurisdictions working in the area (e.g., NPS, U.S. Coast Guard, the tribes, and the USFWS) to implement the management plan. The Sanctuary manager will have an office on the Olympic Coast with administrative support facilities in Seattle.

Comment: Implementation of the final management plan must be adequately funded in order to prevent pollution and resource damage.

Response: The level of funding for the first year after Sanctuary designation will depend upon the Sanctuary Program's funding which is authorized and appropriated by Act of Congress. However, the reality of the program's funding situation will require the manager and SAC to identify alternative sources of funding for Sanctuary programs.

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Comment: A volunteer program, coordinated by a full-time volunteer coordinator, should be established to assist in implementation of the management plan.

Response: NOAA agrees that the establishment of a volunteer program can assist in implementation of the management plan. The SAC will be influential in determining the priority of hiring a volunteer coordinator.

Comment: The management alternatives should more accurately describe NOAA's comprehensive planning as implemented through a combination of legal management authority over certain specific Sanctuary activities and advisory coordination with other entities managing the remaining essential components.

Response: NOAA agrees. The FEIS/MP outlines the regulations which NOAA is promulgating. The FEIS/MP also outlines the role of the SAC, whose composition is aimed at enhancing the coordination with other entities with management jurisdiction in the Sanctuary.

Comment: The Sanctuary manager should have a great deal of responsibility for setting the Sanctuary budget, as well as assigning funds to local governments for assistance in implementing management plans.

Response: The Sanctuary manager will have primary responsibility for recommending the Sanctuary budget to
headquarters. The Sanctuaries and Reserves Division has responsibility for the entire National Marine Sanctuary Program budget, and will work with the site manager to develop the annual program budget. The manager has the discretion to earmark funds to local governments or groups to implement Sanctuary programs.

**Comment:** Zoning plans should be implemented which accommodate the varying resource management needs within the Sanctuary. Some zoning examples include allowing for the needs of ports to the south, designating areas which would be closed to all consumptive uses on a rotating basis, and zoning specific areas within the sanctuary for the sole purposes of research, recreational use, commercial use and no use.

**Response:** Zoning is not anticipated as part of the FEIS/MP for the Sanctuary. If NOAA, in consultation with the SAC, believes that zoning would better meet the needs of the program, the management plan and regulations can be amended in accordance with the requirements of the MPRSA, the NEPA and the APA.

**Research/Education Protocol**

**Comment:** Research results and data should be shared through existing databases with Federal and state agencies and tribes. The sharing of data should be formalized through cooperative agreements.

**Response:** NOAA agrees that research results and data should be shared and will pursue appropriate cooperative agreements to ensure this coordination.
Comment: It is unnecessary to severely restrict or eliminate activities such as fishing, commercial vessel activity, dredging and aircraft operation in order to carry out the Sanctuary goals of promoting research and public education.

Response: The primary goal of sanctuary designation is the comprehensive long-term protection of marine resources. Some restrictions are necessary to accomplish this goal. Of the above activities, only dredging is being eliminated within the Sanctuary boundary. Research and education provide additional means to promote the goal of marine resource protection.

Comment: Geophysical exploration should not be prohibited, as the information gathered from this research can benefit coastal communities and academic institutions.

Response: NOAA’s emphasis on research within the Sanctuary allows for research which may involve an otherwise prohibited activity (such as alteration of or construction on the seabed) as long as researchers obtain a research permit pursuant to section 925.9 of the Sanctuary regulations. NOAA will determine the environmental consequences of the proposed research, including short and long term effects on marine biota (such as noise which may interfere with cetacean communication) in deciding whether to issue a permit.

Comment: The research program should stress applied research such as research which can facilitate fisheries management,
provide information on long-term environmental trends, and provide links between the marine systems and the adjacent terrestrial systems. Providing research results to decision makers at the various governmental levels would be an important link in addressing marine resource problems.

Response: NOAA agrees and has clarified this point in the research section of the management plan.

Comment: Criteria for acceptable research within the Sanctuary should be established prior to formal designation of the Sanctuary. The criteria should be used in review of research permit applications, and an appeal process should be established in the case of research permit application denial.

Response: Research permit applications will be reviewed on a case-by-case basis and evaluated to determine the potential short and long term impacts of the proposed activities. In addition, section 925.12 of the regulations sets forth the procedures for appealing to the Assistant Administrator the denial of a research permit.

Comment: NOAA should conduct research into the effects of fishing activities on the entire marine system. Fish stocks, species abundance, and monitoring information should be presented to the PFMC.

Response: The National Ocean Service (which includes the Sanctuaries and Reserves Division) and the NMFS have entered into
a Memorandum of Understanding outlining the working relationship between the Sanctuary Program and the NMFS. The PFMC will be involved in this agreement, through its relationship with the NMFS. Research which benefits the overall goal of resource protection is addressed within this agreement by highlighting the need for interagency coordination, research and monitoring.

**Comment:** The benefits of sanctuary designation to the fishing community and others should be clearly articulated. Additionally, connections between the regulations and resource protection should be integrated in the education plan (e.g., establishing warning signs at popular access sites to alert boaters and hikers to the effect of disturbance of pelagic birds and marine mammals.)

**Response:** NOAA agrees and has clarified the education goals in the Sanctuary management plan. NOAA has articulated the benefits of the Sanctuary program for the fishing community. NOAA will coordinate with the USFWS and the NPS to post warning signs around critical marine bird and mammal habitat.

**Comment:** NOAA should provide for increased education and interpretation of the shoreline through a variety of media. Educational materials and outreach programs should be developed by pre-existing facilities and organizations on the Olympic Peninsula.

**Response:** Sanctuary designation will provide for increased

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education and interpretation of the entire Sanctuary ecosystem. Education materials and outreach programs will be developed in cooperation with existing Federal, tribal, state and local entities.

**ISSUE: INFORMATIONAL AMENDMENTS OF THE DEIS/MP**

**Biological Amendments**

Comment: The discussion of the neretic and shelf edge environments in the DEIS/MP needs to be expanded. The resource assessment must stress the biological richness of the area.

Response: The resource assessment describing the ecosystem of the Sanctuary study area has been expanded in the FEIS/MP.

Comment: Biological resources need to be discussed in terms of ecosystem interactions and not single species descriptions.

Response: NOAA has expanded the discussion to include a description of the study area from an ecosystem perspective.

**Socioeconomic**

Comment: The FEIS/MP must contain a socioeconomic impact study of the regulations on the affected coastal communities and Tribes. Failure to consider and mitigate these impacts violates the NEPA and Federal Trust responsibility to Indians.

Response: An economic analysis has been included within the FEIS/MP. NOAA is not promulgating regulations that will unduly burden the tribes. The regulations have provisions that recognize treaty secured rights. In addition, NOAA will consult
with the tribes when considering permits affecting proposed
development activities in the Sanctuary. NOAA believes that the
regulations do not conflict with the economic interests of the
tribes since the regulations offer increased protection for those
natural resources critical to the tribal economy.

Comment: The Federal government should investigate the
possibility of tax breaks to offset economic impacts of the
management plan.

Response: NOAA’s actions do not add economic burdens to the
area. The issue of tax breaks should be addressed to an
individual’s representatives in Congress. NOAA does not have the
legislative authority to address tax laws.

Supplemental Draft Environmental Impact Statement

Comment: NOAA should submit a supplemental Draft
Environmental Impact Statement for the following reasons: 1) the
DEIS/MP lacks a satisfactory examination of the socioeconomic
impacts of the regulations on the coastal communities; 2) the
DEIS/MP contains erroneous information related to port activities
in Grays Harbor; 3) some information is missing, outdated, or
inaccurate; 4) inadequate definition of the unique environment
deserving protection that is identified by the SEL.

Response: NOAA has determined that the matters for which an
SEIS has been requested can be addressed in the FEIS/MP. The
FEIS/MP addresses the socioeconomic impacts of regulations that
could potentially affect the coastal communities in the alternatives and consequences section. Further, the vessel traffic section has been amended substantially to provide a detailed description of the significance of vessel traffic to the coastal communities. Additionally, the description of the marine environment under consideration has been expanded greatly.

Management

Comment: NOAA needs to address or recognize a number of current local and state regulatory controls in place within the shoreline areas.

Response: NOAA has addressed local and state regulatory controls within the shoreline areas. These controls are listed in Appendix J.
The following sets forth the text of the Designation Document for the Olympic Coast National Marine Sanctuary.

DESIGNATION DOCUMENT FOR
THE OLYMPIC COAST NATIONAL MARINE SANCTUARY

Under the authority of Title III of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended (the "Act"), 16 U.S.C. §§ 1431 et seq., the waters off the Olympic Coast of Washington State including the U.S. portion of the Strait of Juan de Fuca west of Koitlah Point, and the submerged lands thereunder, as described in Article II, are hereby designated as the Olympic Coast National Marine Sanctuary for the purposes of protecting and managing the conservation, ecological, recreational, research, educational, historical and aesthetic resources and qualities of the area.

Article I. Effect of Designation

The Act authorizes the issuance of such final regulations as are necessary and reasonable to implement the designation, including managing and protecting the conservation, recreational, ecological, historical, research, educational, and aesthetic resources and qualities of the Olympic Coast National Marine Sanctuary. Section 1 of Article IV of this Designation Document lists activities that either will be regulated on the effective date of designation or may have to be regulated at some later date in order to protect Sanctuary resources and qualities. Listing does not necessarily mean that a type of activity will be
regulated; however, if an activity is not listed, it may not be regulated, except on an emergency basis, unless section 1 of Article IV is amended to include the type of activity by the same procedures by which the original designation was made.

Article II. Description of the Sanctuary Area

The Olympic Coast National Marine Sanctuary boundary encompasses approximately 2500 square nautical miles (approximately 8577 sq. kilometers) of coastal and ocean waters, and the submerged lands thereunder, off the central and northern coast of the State of Washington. The Sanctuary boundary extends from Koitlah Point due north to the United States/Canada international boundary seaward to the 100 fathom isobath. The seaward boundary of the Sanctuary approximates the 100 fathom isobath in a southerly direction from the U.S./Canada international boundary to a point due west of the Copalis River, cutting across the heads of Nitnat, Juan de Fuca, and Quinault Canyons.

The shoreward boundary of the Sanctuary is the mean lower low water line when adjacent to Indian reservations and State and county lands. When adjacent to Federally managed lands, the coastal boundary extends to the mean higher high water line. The coastal boundary cuts across the mouths of all rivers and streams. The precise boundary of the Sanctuary is set forth in Appendix I of this Designation Document.
Article III. Characteristics of the Sanctuary Area That Give it Particular Value

The Sanctuary is a highly productive, nearly pristine ocean and coastal environment that is important to the continued survival of several ecologically and commercially important species of fish, seabirds, and marine mammals. Its rugged and undeveloped coastline makes the region one of the more dramatic natural wonders of the coastal United States, paralleling the majestic splendor of such terrestrial counterparts as Yosemite National Park and the Grand Tetons. The region’s high biological productivity is fueled by seasonal enhanced upwelling along the edge of the continental shelf, especially at submarine canyons, during periods of high solar radiation.

The diversity of habitats that make up the Sanctuary support a great variety of biological communities. This unusually large range of habitat types include: offshore islands and rocks; some of the most diverse kelp beds in the world; intertidal pools; erosional features such as rocky headlands, seastacks, and arches; interspersed exposed beaches and protected bays; submarine canyons and ridges; the continental shelf, including a broad shallow plateau extending from the mouth of the Juan de Fuca canyon; and continental slope environments. The numerous seastacks and rocky outcrops along the Sanctuary shoreline, coupled with a large tidal range and wave splash zone, support some of the most diverse and complex intertidal zones in the United States.
The Sanctuary provides an essential habitat for a wide variety of marine mammals and birds, and is of particular interest due to the presence of endangered and threatened species that live or migrate through the region. Twenty seven species of marine mammals are reported to breed, rest within, or migrate offshore of the Olympic Peninsula. Of particular interest is the migration route of the endangered California gray whale, the threatened northern sea lion, the occasional presence of the endangered right, fin, sei, blue, humpback, and sperm whales, and the reintroduced resident population of sea otters.

In addition, the seabird colonies of Washington's outer coast are among the largest in the continental United States and include a number of species listed as endangered or threatened including the short-tailed albatross, peregrine falcon, brown pelican, Aleutian Canada goose, marbled murrelet, and one of the largest populations of bald eagles in the continental United States.

The high biological productivity of the coastal and offshore waters in the Sanctuary support valuable fisheries that contribute significantly to the State and tribal economies. The commercially important species of fish include five species of salmon, groundfish, and shellfish.

In addition to the Sanctuary's value with respect to its biological resources, the region encompasses significant historical resources including Indian village sites, ancient canoe runs, petroglyphs, Indian artifacts, and numerous
shipwrecks.

The diversity and richness of marine resources suggests that the marine sanctuary designations will provide exceptional opportunities for scientific research in the areas of species interactions, population dynamics, physiological ecology, linkages between terrestrial and aquatic ecosystems, and marine anthropology. The scientific research encouraged by the Sanctuary management plan will, in turn, help support an intensive public education and awareness program that will address the diverse, complex, and sensitive ecosystems in Washington's coastal and oceanic environments.

Article IV. Scope of Regulations

Section 1. Activities Subject to Regulation

The following activities are subject to regulation, including prohibition, to the extent necessary and reasonable to ensure the protection and management of the conservation, ecological, recreational, research, educational, historical and aesthetic resources and qualities of the area:

a. Exploring for, developing, or producing oil, gas or minerals (e.g., clay, stone, sand, metalliferous ores, gravel, non-metalliferous ores or any other solid material or other solid matter of commercial value) within the Sanctuary;

b. Discharging or depositing from within the boundary of the Sanctuary, any material or other matter;

c. Discharging or depositing, from beyond the boundary of
the Sanctuary, any material or other matter;

d. Taking, removing, moving, catching, collecting, harvesting, feeding, injuring, destroying or causing the loss of, or attempting to take, remove, move, catch, collect, harvest, feed, injure, destroy or cause the loss of, a marine mammal, sea turtle, seabird, historical resource or other Sanctuary resource;

e. Drilling into, dredging, or otherwise altering the seabed of the Sanctuary; or constructing, placing, or abandoning any structure, material or other matter on the seabed of the Sanctuary;

f. Possessing within the Sanctuary a Sanctuary resource or any other resource, regardless of where taken, removed, moved, caught, collected or harvested, that, if it had been found within the Sanctuary, would be a Sanctuary resource;

g. Flying a motorized aircraft above the Sanctuary;

h. Operating a vessel (i.e., watercraft of any description in the Sanctuary;

i. Harvesting kelp within the Sanctuary;

j. Interfacing with, obstructing, delaying or preventing an investigation, search, seizure or disposition of seized property in connection with enforcement of the Act or any regulation or permit issued under the Act.

Section 2. Emergencies

Where necessary to prevent or minimize the destruction of,
loss of, or injury to a Sanctuary resource or quality, or minimize the imminent risk of such destruction, loss or injury, any and all activities, including those not listed in Section 1 of this Article, are subject to immediate temporary regulation, including prohibition.

Article V. Effect on Leases, Permits, Licenses, and Rights

Pursuant to Section 304(c)(1) of the Act, 16 U.S.C. § 1434(c)(1), no valid lease, permit, license, or other authorization issued by any Federal, State, or local authority of competent jurisdiction, or any right of subsistence use of access, may be terminated by the Secretary of Commerce or designee as a result of this designation. The Secretary of Commerce or designee, however, may regulate the exercise (including, but not limited to, the imposition of terms and conditions) of such authorization or right consistent with the purposes for which the Sanctuary is designated.

In no event may the Secretary or designee issue a permit authorizing, or otherwise approve: (1) exploration for, development or production of oil, gas or minerals within the Sanctuary; (2) the discharge of primary treated sewage (except for regulation, pursuant to Section 304(c)(2) of the Act, of the exercise of valid authorizations in existence on the effective date of Sanctuary designation and issued by other authorities of competent jurisdiction); (3) the disposal of dredged material within the Sanctuary other than in connection with beach nourishment projects related to harbor maintenance activities; or
(4) bombing activities within the Sanctuary. Any purported authorizations issued by other authorities after the effective date of Sanctuary designation for any of these activities within the Sanctuary shall be invalid.

Article VI. Alteration of this Designation

The terms of designation, as defined under Section 304(a) of the Act, may be modified only by the same procedures by which the original designation is made, including public hearings consultation with interested Federal, State, and local agencies, review by the appropriate Congressional committees and the Governor of the State of Washington, and approval by the Secretary of Commerce or designee.
Appendix I  Olympic Coast National Marine Sanctuary

Boundary Coordinates.  (Based on North American Datum of 1983).

2500 square nautical miles

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III. Summary of Final Management Plan

The FEIS/MP for the Olympic Coast National Marine Sanctuary sets forth the Sanctuary's location and provides details on the most important resources and uses of the Sanctuary. The FEIS/MP describes the resources and uses of the Sanctuary. The FEIS/MP describes the resource protection, research, education and interpretive programs, and establishes goals and objectives to be accomplished by each program. The FEIS/MP includes a detailed discussion, by program area, of agency roles and responsibilities.

The goals and objectives for the Sanctuary are:

Resource Protection

The highest priority management goal is to protect the marine environment, resources and qualities of the Sanctuary. The specific objectives of protection efforts are to:

1. Coordinate policies and procedures among agencies sharing responsibility for protection and management of resources;

2. Encourage participation by interested agencies and organizations in the development of procedures to address specific management concerns (e.g., monitoring and emergency-response programs);

3. Develop an effective and coordinated program for the enforcement of Sanctuary regulations;

4. Enforce Sanctuary regulations in addition to other regulations already in place;
(5) Promote public awareness of, and voluntary compliance with, Sanctuary regulations and objectives, through an educational/interpretive program stressing resource sensitivity and wise use;

(6) Ensure that the water quality of the coastal and ocean waters off the Olympic Peninsula is maintained at a level consonant with Sanctuary designation;

(7) Establish mechanisms for coordination among all the agencies participating in Sanctuary management;

(8) Ensure that the appropriate management agencies incorporate research results and scientific data into effective resource protection strategies; and

(9) Reduce threats to Sanctuary resources and qualities.

Research Program

Effective management of the Sanctuary requires the implementation of a Sanctuary research program. The purpose of Sanctuary research activities is to improve understanding of the marine environment off the Olympic peninsula, its resources and qualities, and to resolve specific management problems, some of which may involve resources common to both the marine and upland freshwater environments. Research results will be used in interpretive programs for visitors, for those living on the Peninsula, and working adjacent to or in the Sanctuary, others interested in the Sanctuary, as well as for protection and management of resources and qualities.

Specific objectives of the research program are to:

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(1) Establish a framework and procedures for administering research to ensure that research projects are responsive to management concerns and that results contribute to improve management of the Sanctuary;

(2) Incorporate research results into the interpretive/education program in a format useful for the general public;

(3) Focus and coordinate data collection efforts on the physical, chemical, geological and biological oceanography of the Sanctuary;

(4) Encourage studies that integrate research from the variety of coastal habitats with nearshore and open ocean processes;

(5) Initiate a monitoring program to assess environmental changes as they occur due to natural and human processes;

(6) Identify the range of effects on the environment that would result from predicted changes in human activity or natural phenomena; and

(7) Encourage information exchange among all the organizations and agencies undertaking management-related research in the Sanctuary to promote more informed management.

Education Program

The goal for the education program is to improve public awareness and understanding of the significance of the Sanctuary resources and qualities to foster a heightened sense of stewardship for Sanctuary resources and qualities.
The management objectives designed to meet this goal are to:

(1) Provide the public with information on the Sanctuary and its goals and objectives, with an emphasis on the need to use Sanctuary resources and qualities wisely to ensure their long-term viability;

(2) Broaden support for the Sanctuary management by offering programs suited to visitors with a range of diverse interests;

(3) Foster public involvement by encouraging feedback on the effectiveness of education programs, collaboration with Sanctuary management staff in extension and outreach programs, and participation in other volunteer programs; and

(4) Collaborate with other organizations to provide educational services complementary to the Sanctuary program.

**Visitor Use**

The Sanctuary goal for visitor management is to facilitate, to the extent compatible with the primary objective of resource protection, public and private uses of the resources of the Sanctuary not prohibited pursuant to other authorities.

Specific management objectives are to:

(1) Provide relevant information about Sanctuary regulations, use policies and standards;

(2) Collaborate with public and private organizations in promoting compatible uses of the Sanctuary;

(3) Encourage the public who use the Sanctuary to respect sensitive Sanctuary resources and qualities; and

(4) Monitor and assess the levels of use to identify and
control potential degradation of resources and qualities and minimize potential user conflicts.

The Sanctuary headquarters will be located at a yet to be determined location.
IV. *Summary of Regulations*

The regulations set forth the boundary of the Sanctuary; prohibit a relatively narrow range of activities; set forth procedures for applying for national marine sanctuary permits to conduct prohibited activities; set forth certification procedures for existing leases, licenses, permits, other authorizations or rights authorizing the conduct of a prohibited activity; set forth notification and review procedures for applications for licenses, permits, or other authorizations to conduct a prohibited activity; set forth the maximum per-day penalties for violating Sanctuary regulations; and set forth procedures for administrative appeals.

The regulations are codified in part 925 of *Title 15, Code of Federal Regulations*.

Section 925.1 sets forth as the purpose of the regulations to implement the designation of the Olympic Coast National Marine Sanctuary by regulating activities affecting the Sanctuary consistent with the terms of that designation in order to protect and manage the conservation, ecological, recreational, research, educational, historical and aesthetic resources and qualities of the area.

Section 925.2 and Appendix I following § 925.12 set forth the boundary of the Sanctuary.

Section 925.3 defines various terms used in the regulations. Other terms appearing in the regulations are defined at 15 CFR 922.2 and/or in the MFRSA.

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Section 925.4 allows all activities except those prohibited by § 925.5 to be undertaken subject to the requirements of any emergency regulation promulgated pursuant to § 925.6, subject to all prohibitions, restrictions and conditions validly imposed by any other authority of competent jurisdiction, and subject to the liability established by Section 312 of the Act.

Section 925.5 prohibits a variety of activities and thus makes it unlawful for any person to conduct them or cause them to be conducted. However, any of the prohibited activities except for: (1) the exploration for, development or production of oil, gas or minerals in the Sanctuary; (2) the discharge of primary-treated sewage within the Sanctuary (except pursuant to certification under § 925.10, of a valid authorization in existence on the effective date of Sanctuary designation and issued by other authorities of competent jurisdiction); (3) the disposal of dredged material within the Sanctuary other than in connection with beach nourishment projects related to harbor maintenance activities; and (4) bombing activities within the Sanctuary could be conducted lawfully if:

(1) The activity is necessary to respond to an emergency threatening life, property, or the environment (not applicable to the prohibitions against takings and interference with law enforcement); authorized by a National Marine Sanctuary permit issued under § 925.9 (not applicable to the prohibition against interference with law enforcement); or authorized by a Special Use Permit issued under Section 310 of the Act (not applicable to
the prohibition against interference with law enforcement);

(2) With regard to Department of Defense activities: (A) the activity is an existing military activity including hull integrity tests and other deep water tests; live firing of guns, missiles, torpedoes, and chaff; activities associated with the Quinault Range including the in-water testing of non-explosive torpedoes; and anti-submarine warfare operations, or (B) the activity is a new activity and exempted by the Director of the Office of Ocean and Coastal Resource Management or designee after consultation between the Director or designee and the Department of Defense. The regulations require that the Department of Defense carry out its activities in a manner that avoids to the maximum extent practicable any adverse impact on Sanctuary resources and qualities and that it, in the event of threatened or actual destruction of, loss of, or injury to a Sanctuary resource or quality resulting from an untoward incident, including but not limited to spills and groundings, caused by it, promptly coordinate with the Director or designee for the purpose of taking appropriate actions to respond to and mitigate the harm and, if possible, restore or replace the Sanctuary resource or quality. The final regulation regarding Department of Defense activities differs from the proposed regulation principally by prohibiting all bombing activities within the Sanctuary;

(3) The activity is authorized by a certification by the Director of the Office of Ocean and Coastal Resource Management
or designee under § 924.10 of a valid lease, permit, license or other authorization issued by any Federal, State or local authority of competent jurisdiction and in existence on (or conducted pursuant to any valid right of subsistence use or access in existence on) the effective date of this designation, subject to complying with any terms and conditions imposed by the Director or designee as he or she deems necessary to achieve the purposes for which the Sanctuary was designated;

(4) The activity is authorized by a valid lease, permit, license, or other authorization issued by any Federal, State or local authority of competent jurisdiction after the effective date of Sanctuary designation, provided that the Director of the Office of Ocean and Coastal Resource Management or designee was notified of the application in accordance with the requirements of § 925.11, the applicant complies with the requirements of § 925.11, the Director or designee notifies the applicant and authorizing agency that he or she does not object to issuance of the authorization, and the applicant complies with any terms and conditions the Director or designee deems necessary to protect Sanctuary resources and qualities.

The first activity prohibited is exploring for, developing or producing oil, gas or minerals within the Sanctuary. With regard to oil and gas, this regulation implements the requirements of Section 2207 of the Oceans Act of 1992 which prohibits "oil or gas leasing or pre-leasing activity [from being] conducted within the area designated as the Olympic Coast

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National Marine Sanctuary . . . ." The resources and qualities of the coastal and offshore waters of the Olympic Peninsula, particularly the sea birds and pinnipeds that use the haul-out sites, kelp forests and rocks along the Olympic Coast, and the high water quality of the area, are especially vulnerable to oil and gas activities in the area. A prohibition on oil and gas exploration, development and production activities within the Sanctuary boundary partially protects Sanctuary resources and qualities from oil and gas activities. Only partial protection will be provided due to the remaining threat from oil and gas from vessel traffic transiting through and near the Sanctuary, particularly oil tankers not operating in accordance with the voluntary agreement of the Western States Petroleum Association to remain 50 nautical miles from shore. A prohibition on mineral activities within the Sanctuary is consistent with the prohibition on alteration of or construction on the seabed as discussed below. "Mineral" is defined to mean clay, stone, sand, gravel, metalliferous ore, nonmetalliferous ore, or any other solid material or other solid matter of commercial value. The prohibition on oil, gas and mineral activities additionally will prevent the negative effects of physical and possible chemical disturbances associated with extraction activities, e.g., destruction of benthic biota; resuspension of fine sediments; interference with filtering, feeding and respiratory functions of marine organisms; loss of food sources and habitats; and lowered photosynthesis and oxygen levels.
The second activity prohibited is depositing or discharging from within the boundary of the Sanctuary any material or other matter except: (1) fish, fish parts, chumming materials or bait used in or resulting from traditional fishing operations in the Sanctuary; (2) biodegradable effluent incidental to vessel use and generated by marine sanitation devices approved in accordance with Section 312 of the Federal Water Pollution Control Act, as amended, (FWPCA), 33 U.S.C. 1322 et seq.; (3) water generated by routine vessel operations (e.g., cooling water, deck wash down and graywater as defined by Section 312 of the FWPCA) excluding oily-wastes from bilge pumping; (4) engine exhaust; and (5) dredge spoil in connection with beach nourishment projects related to harbor maintenance activities.

This prohibition is necessary to protect Sanctuary resources and qualities from the effects of pollutants deposited or discharged into the Sanctuary.

After expiration of current permits, discharges from municipal treatment plants will be subject to the review process of § 925.11. At a minimum, secondary treatment will be required. Depending on the risk to Sanctuary resources and qualities, greater treatment may be required. The intent of this prohibition is to protect Sanctuary resources and qualities from the effects of land and sea originating pollutants.

The third activity prohibited is depositing or discharging, from beyond the boundary of the Sanctuary, any material or other matter that subsequently enters the Sanctuary and injures a
Sanctuary resource or quality, except for the five exclusions discussed above for the second prohibited activity.

The fourth activity prohibited is moving, removing or injuring or attempting to move, remove or injure a Sanctuary historical resource. Historical resources in the marine environment are fragile, finite and non-renewable. This prohibition is designed to protect these resources so that they may be researched and information about their contents and type made available for the benefit of the public. This prohibition does not apply to moving, removing or injury resulting incidentally from traditional fishing operations.

Historical resources located within the Sanctuary that are of significance to an Indian tribe(s) (e.g., submerged Indian villages) will be managed so as to protect other Sanctuary resources and the interests of the governing body of an Indian tribe(s) in such historical resources. If an Indian tribe determines that a historical resource of tribal significance should be researched, excavated or salvaged, the Sanctuary manager may issue a Sanctuary permit if the criteria for issuance have been met (See § 925.9). The terms and conditions of the permit will ensure that the Sanctuary program has access to artifacts and research results for education purposes and that the artifacts are placed in a location agreed upon by the interested Indian tribes.

The fifth activity prohibited is drilling into, dredging or otherwise altering the seabed of the Sanctuary; or constructing,
placing or abandoning any structure, material or other matter on the seabed of the Sanctuary, except if any of the above results incidentally from: (1) anchoring vessels; (2) traditional fishing operations; (3) installation of navigation aids; (4) harbor maintenance in the areas necessarily associated with Federal Projects in existence on the effective date of Sanctuary designation, including dredging of entrance channels and harbors, and repair, replacement or rehabilitation of breakwaters and jetties; (5) construction, repair, replacement, enhancement or rehabilitation of docks or piers; or (6) beach nourishment projects related to harbor maintenance activities. Federal projects are any water resources development projects conducted by the U.S. Army Corps of Engineers or operating under a permit or authorization issued by the Corps of Engineers and authorized by Federal law.

The intent of this prohibition is to protect the resources and qualities of the Sanctuary from the harmful effects of activities such as, but not limited to, archaeological excavations, drilling into the seabed, strip mining, laying of pipelines and outfalls, and offshore commercial development, which may disrupt and/or destroy sensitive marine benthic habitats, such as kelp beds, invertebrate populations, fish habitats and estuaries.

The sixth activity prohibited is taking marine mammals, sea turtles or seabirds in or above the Sanctuary, except as authorized by NMFS or USFWS under the authority of the Marine
Mammal Protection Act, as amended, (MMPA), 16 U.S.C. §§ 1361 et seq., the Endangered Species Act, as amended, (ESA), 16 U.S.C. §§ 1531 et seq., and the Migratory Bird Treaty Act, as amended, (MBTA), 16 U.S.C. §§ 703 et seq., or pursuant to a treaty with an Indian tribe to which the United States is a party, provided that the treaty right is exercised in accordance with the MMPA, ESA and MBTA. The term "taking" includes all forms of harassment. The MMPA, ESA and MBTA prohibit the taking of species protected under those acts. The prohibition overlaps with the MMPA, ESA and MBTA but also extends protection for Sanctuary resources on an environmentally holistic basis and provides a greater deterrent with civil penalties of up to $100,000 per taking. The prohibition covers all marine mammals, sea turtles and seabirds in or above the Sanctuary. The prohibition recognizes existing treaty rights to hunt marine mammals, sea turtles and seabirds to the extent that the treaty rights have not been abrogated by provisions of the MMPA, ESA or MBTA.

The seventh activity prohibited is flying motorized aircraft at less than 2,000 feet (610m) both above the Sanctuary within one nautical mile of the Flattery Rocks, Quillayute Needles or Copalis National Wildlife Refuge, or within one nautical mile seaward of the coastal boundary of the Sanctuary, except as necessary for valid law enforcement purposes, for activities related to tribal timber operations conducted on reservation lands, or to transport persons or supplies to or from reservation
lands as authorized by a governing body of an Indian tribe. This prohibition is designed to limit potential noise impacts, particularly those that might startle hauled-out seals and sea lions, and colonial seabirds along the shoreline margins of the Sanctuary.

Both the eighth and ninth prohibitions serve to facilitate enforcement actions for violations of Sanctuary regulations. The eighth prohibition is the possession within the Sanctuary of any historical resource or marine mammal, sea turtle or seabird, regardless of where the resource was taken, except in compliance with the MMPA, ESA and MBTA and the ninth prohibition is interfering with, obstructing, delaying or preventing investigations, searches, seizures or disposition of seized property in connection with enforcement of the Act or any regulation or permit issued under the Act.

Section 925.6 authorizes the regulation, including prohibition, on a temporary basis of any activity where necessary to prevent or minimize the destruction of, loss of, or injury to a Sanctuary resource or quality, or minimize the imminent risk of such destruction, loss or injury.

Section 925.7 sets for the maximum statutory civil penalty for violating a regulation -- $100,000. Each day of a continuing violation constitutes a separate violation. Section 925.8 repeats the provision in Section 312 of the Act that any person who destroys, causes the loss of, or injures any sanctuary resource is liable to the United States for response costs and
damages resulting from such destruction, loss or injury, and any vessel used to destroy, cause the loss of, or injure any sanctuary resource is liable in rem to the United States for response costs and damages resulting from such destruction, loss or injury. The purpose of these sections is to draw the public’s attention to the liability for violating a Sanctuary regulation or the Act.

Regulations setting forth the procedures governing administrative proceedings for assessment of civil penalties, permit sanctions and denials for enforcement reasons, issuance and use of written warnings, and release or forfeiture of seized property appear in 15 CFR part 904.

Section 925.9 sets forth the procedures for applying for a National Marine Sanctuary permit to conduct a prohibited activity and the criteria governing the issuance, denial, amendment, suspension and revocation of such permits. A permit may be granted by the Director of the Office for Ocean and Coastal Resource Management or designee if he or she finds that the activity will have only negligible short-term adverse effects on Sanctuary resources and qualities and will: further research related to Sanctuary resources; further the educational, natural or historical resource value of the Sanctuary; further salvage or recovery operations in or near the Sanctuary in connection with a recent air or marine casualty; assist in the management of the Sanctuary; or further salvage or recovery operations in connection with an abandoned shipwreck in the Sanctuary title to
which is held by the State of Washington. In deciding whether to issue a permit, the Director or designee may consider such factors as the professional qualifications and financial ability of the applicant as related to the proposed activity, the duration of the activity and the duration of its effects, the appropriateness of the methods and procedures proposed by the applicant for the conduct of the activity, the extent to which the conduct of the activity may diminish or enhance Sanctuary resources and qualities, the cumulative effects of the activity, the end value of the activity, and the effects of the activity on adjacent Indian tribes. In addition, the Director or designee is authorized to consider any other factors she or he deems appropriate.

Section 925.10 sets forth procedures for requesting certification of leases, licenses, permits, other authorizations, or rights in existence on the date of Sanctuary designation authorizing the conduct of an activity prohibited under paragraphs (a)(2)-(8) of § 925.5. Pursuant to paragraph (f) of § 925.5, the prohibitions in paragraphs (a)(2)-(8) of § 925.5 do not apply to any activity authorized by a valid lease, permit, license, or other authorization in existence on the effective date of Sanctuary designation and issued by any Federal, State or local authority of competent jurisdiction, or by any valid right of subsistence use or access in existence on the effective date of Sanctuary designation, provided that the holder of such authorization or right complies with the requirements of § 925.10
(e.g. notifies the Director or designee of the existence of, requests certification of, and provides requested information regarding such authorization or right) and complies with any terms and conditions on the exercise of such authorization or right imposed as a condition of certification by the Director or designee as she or he deems necessary to achieve the purposes for which the Sanctuary was designated.

Section 925.10 allows the holder 90 days from the effective date of Sanctuary designation to request certification. The holder is allowed to conduct the activity without being in violation of the prohibitions in paragraphs (a)(2)-(8) of § 925.5 with regard to which the holder is requesting certification pending final agency action on his or her certification request, provided the holder has complied with all requirements of § 925.10.

Section 925.10 also allows the Director or designee to request additional information from the holder and to seek the views of other persons.

As a condition of certification, the Director or designee will impose such terms and conditions on the exercise of such lease, permit, license, other authorization or right as she or he deems necessary to achieve the purposes for which the Sanctuary was designated. This is consistent with the Secretary's authority under Section 304(c)(2) of the Act. The holder may appeal any action conditioning, amending, suspending or revoking any certification in accordance with the procedures set forth in
§ 925.12.

Any amendment, renewal or extension not in existence as of the date of Sanctuary designation of a lease, permit, license, other authorization or right is subject to the provisions of § 925.11.

Section 925.11 states that consistent with paragraph (g) of § 925.5, the prohibitions of paragraphs (a)(2)-(8) of § 925.5 do not apply to any activity authorized by any valid lease, permit, license, or other authorization issued after the effective date of Sanctuary designation by any Federal, State or local authority of competent jurisdiction, provided that the applicant notifies the Director or designee of the application for such authorization within 15 days of the date of filing of the application or of the effective date of Sanctuary designation, whichever is later, that the applicant is in compliance with the other provisions of § 925.11, that the Director or designee notifies the applicant and authorizing agency that he or she does not object to issuance of the authorization, and that the applicant complies with any terms and conditions the Director or designee deems necessary to protect Sanctuary resources and qualities.

Section 925.11 allows the Director or designee to request additional information from the applicant and to seek the views of other persons.

An application for an amendment to, an extension of, or a renewal of an authorization is also subject to the provisions of
§ 925.11.

The applicant may appeal any objection by, or terms or conditions imposed by, the Director or designee to the Assistant Administrator or designee in accordance with the procedures set forth in § 925.12.

Section 925.12 sets forth the procedures for appealing to the Assistant Administrator or designee actions of the Director or designee with respect to: 1) the granting, conditioning, amendment, denial, suspension or revocation of a National Marine Sanctuary permit under § 925.9 or a Special Use permit under Section 310 of the Act; 2) the granting, denial, conditioning, amendment, suspension or revocation of a certification under § 925.10; or 3) the objection to issuance or the imposition of terms and conditions under § 925.11.

Prior to conditioning the exercise of existing leases, permits, licenses, other authorizations or rights or conditioning or objecting to proposed authorizations, NOAA intends to consult with relevant issuing agencies as well as owners, holders or applicants.

NOAA's policy is to encourage best available management practices to minimize non-point source pollution entering the Sanctuary and, for municipal sewage discharge, to require, at a minimum, secondary treatment and sometimes tertiary treatment or more, depending on predicted effects on Sanctuary resources and qualities.
V. Miscellaneous Rulemaking Requirements

Executive Order 12291

Under Executive Order 12291, the Department must judge whether the regulations in this notice are "major" within the meaning of section 1 of the Order, and therefore subject to the requirement that a Regulatory Impact Analysis be prepared. The Administrator of NOAA has determined that the regulations in this notice are not major because they are not likely to result in:

1. An annual effect on the economy of $100 million or more;
2. A major increase in costs or prices for consumers, individual industries, Federal, state or local government agencies or geographic regions; or
3. Significant adverse effects on competition, employment, investment, productivity, innovation or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Regulatory Flexibility Act

The regulations in this notice allow all activities to be conducted in the Sanctuary other than a relatively narrow range of prohibited activities. The procedures in these regulations for applying for National Marine Sanctuary permits to conduct prohibited activities, for requesting certifications for pre-existing leases, licenses, permits, other authorizations or rights authorizing the conduct of a prohibited activity and for notifying NOAA of applications for leases, licenses, permits,
approvals or other authorizations to conduct a prohibited activity will all act to lessen any adverse economic effect on small entities. The regulations, in total, will not have a significant economic impact on a substantial number of small entities, and when they were proposed the General Counsel of the Department of Commerce so certified to the Chief Counsel for Advocacy of the Small Business Administration. As a result, neither an initial nor final Regulatory Flexibility Analysis was prepared.

**Paperwork Reduction Act**

This rule contains collection of information requirements subject to the requirements of the Paperwork Reduction Act (Pub. L. 96-511). The collection of information requirements contained in the rule have been reviewed by the Office of Management and Budget (OMB) under section 3504(h) of the Paperwork Reduction Act and have been approved under OMB Control No. 0648-0141. Comments from the public on the collection of information requirements contained in this rule are invited and should be addressed to the Office of Information and Regulatory Affairs, Office of Management and Budget, Paperwork Reduction Project (06480141) Washington, D.C. 20503 (Attn: Desk Officer for NOAA) and to Richard A. Roberts, Room 724, 6010 Executive Boulevard, Rockville, MD 20852.

**Executive Order 12612**

A Federalism Assessment (FA) was prepared for the proposed designation, draft management plan and proposed implementing
regulations. The FA concluded that all were fully consistent with the principles, criteria and requirements set forth in sections 2 through 5 of Executive Order 12612, Federalism Considerations in Policy Formulation and Implementation (52 Fed. Reg. 41685, Oct. 26, 1987). Copies of the FA are available upon request to the Office of ocean and Coastal Resource Management at the address listed above.

National Environmental Policy Act

In accordance with Section 304(a)(2) of the Act (16 U.S.C. § 1434(a)(2)) and the provisions of the National Environmental Policy Act of 1969 (42 U.S.C. §§ 4321-4370(a)), a DEIS/MP was prepared for the designation and proposed regulations. As required by Section 304(a)(2) of the Act, the DEIS/MP included the resource assessment report required by Section 303(b)(3) of the Act (16 U.S.C. § 1433(b)(3)), maps depicting the boundary of the area proposed to be designated, and the existing and potential uses and resources of the area. Copies of the DEIS/MP were made available for public review on September 20, 1991, with comments due on December 13, 1991. Public hearings were held in Port Angeles, Seattle, Olympia, Aberdeen, Seaview and Washington, D.C. from November 7 to 20, 1991. All comments were reviewed and, where appropriate, incorporated into the FEIS/MP and these regulations. Copies of the FEIS/MP are available upon request (see address section).

Executive Order 12630

This rule does not have takings implications within the
meaning of Executive Order 12630 sufficient to require preparation of a Takings Implications Assessment under that order. It would not appear to have an effect on private property sufficiently severe as effectively to deny economically viable use of any distinct legally potential property interest to its owner or to have the effect of, or result in, a permanent or temporary physical occupation, invasion or deprivation. While the prohibition on the exploration, development and production of oil, gas and minerals from the Sanctuary might have a takings implication if it abrogated an existing lease for OCS tracts within the Sanctuary or an approval of an exploration or development and production plan, no OCS leases have been sold for tracts within the Sanctuary and no exploration or production and development plans have been filed or approved.
List of Subjects in 15 CFR Part 925

Administrative practice and procedure, Coastal zone, Education, Environmental protection, Marine resources, Natural resources, Penalties, Recreation and recreation areas, Reporting and recordkeeping requirements, Research.

W. Stanley Wilson
Assistant Administrator for Ocean Services and Coastal Zone Management

Federal Domestic Assistance Catalog Number 11.429
Marine Sanctuary Program
Accordingly, for the reasons set forth above, 15 CFR Chapter IX is amended as follows:

1. Subchapter B heading is added to read as follows:

Subchapter B - Ocean and Coastal Resource Management

2. Part 925 is added to subchapter B to read as follows:

Part 925 - Olympic Coast National Marine Sanctuary

Sec.

925.1 Purpose.
925.2 Boundary.
925.3 Definitions.
925.4 Allowed activities.
925.5 Prohibited activities.
925.6 Emergency regulations.
925.7 Penalties for violations or regulations.
925.8 Response costs and damages.
925.9 National Marine Sanctuary permits - application procedures and issuance criteria.
925.10 Certification of pre-existing leases, licenses, permits, approvals, other authorizations or rights to conduct a prohibited activity.
925.11 Notification and review of applications for leases, licenses, permits, approvals or other authorizations to conduct a prohibited activity.
925.12 Appeals of administrative action.
Appendix to Part 925 - Olympic Coast National Marine Sanctuary

Boundary Coordinates


§ 925.1 Purpose.

The purpose of the regulations in this Part is to implement the designation of the Olympic Coast National Marine Sanctuary by regulating activities affecting the Sanctuary consistent with the terms of that designation in order to protect and manage the conservation, ecological, recreational, research, educational, historical and aesthetic resources and qualities of the area.

§ 925.2 Boundary.

(a) The Olympic Coast National Marine Sanctuary consists of an area of approximately 2500 square nautical miles (approximately 8577 sq. kilometers) of coastal and ocean waters, and the submerged lands thereunder, off the central and northern coast of the State of Washington.

(b) The Sanctuary boundary extends from Koitlah Point due north to the United States/Canada international boundary. The Sanctuary boundary then follows the U.S./Canada international boundary seaward to the 100 fathom isobath. The seaward boundary of the Sanctuary approximates the 100 fathom isobath in a southerly direction from the U.S./Canada international boundary.
to a point due west of the mouth of the Copalis River cutting across the heads of Nitnat, Juan de Fuca and Qu'apualt Canyons. The coastal boundary of the Sanctuary is the mean higher high water line when adjacent to Federally managed lands cutting across the mouths of all rivers and streams, except where adjacent to Indian reservations, state and county owned lands; in such case, the coastal boundary is the mean lower low water line. La Push harbor is excluded from the Sanctuary boundary shoreward of the International Collision at Sea regulation (Colreg.) demarcation lines. The harbor at Neah Bay is excluded shoreward of an arc connecting the western and easternmost points of Neah Bay and adjacent to the outermost boundary of Waldah Island. The precise boundary of the Sanctuary is set forth in Appendix I to this Part.

§ 925.3 Definitions.


Administrator or Under Secretary means the Administrator of the National Oceanic and Atmospheric Administration/Under Secretary of Commerce for Oceans and Atmosphere.

Assistant Administrator means the Assistant Administrator for Ocean Services and Coastal Zone Management, National Oceanic and Atmospheric Administration.

Director means the Director of the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.
Effective date of Sanctuary designation means the date the regulations implementing the designation of the Sanctuary (the regulations in this Part) become effective.

Federal project means any water resources development project conducted by the U.S. Army Corps of Engineers or operating under a permit or authorization issued by the Corps of Engineers and authorized by Federal law.

Historical resource means any resource possessing historical, cultural, archaeological or paleontological significance, including sites, structures, districts and objects significantly associated with or representative of earlier people, cultures and human activities and events. Historical resources include historical properties as defined in the National Historic Preservation Act, as amended, and implementing regulations, as amended.

Indian reservation means a tract of land set aside by the Federal Government for use by a Federally recognized American Indian tribe and includes, but is not limited to, the Makah, Quileute, Hoh and Quinault Reservations.

Indian tribe means any American Indian tribe, band, group, or community recognized by the Secretary of the Interior.

Injure means to change adversely, either in the short or long term, a chemical, biological or physical attribute of, or the viability of, and includes, but is not limited to, to cause the loss of or to destroy.

Mineral means clay, stone, sand, gravel, metalliferous ore,
non-metalliferous ore, or any other solid material or other solid matter of commercial value.

Person means any private individual, partnership, corporation or other entity; or any officer, employee, agent, department, agency or instrumentality of the Federal Government, of any State or local unit of government, or of any foreign government.

Sanctuary means the Olympic Coast National Marine Sanctuary.

Sanctuary quality means any particular and essential characteristic of the Sanctuary, including, but not limited to, water, sediment and air quality.

Sanctuary resource means any living or non-living resource of the Sanctuary that contributes to its conservation, recreational, ecological, historical, research, educational or aesthetic value, including, but not limited to, the substratum of the waters off the Olympic Peninsula, bottom formations, marine plants and algae, invertebrates, plankton, fish, birds, turtles, marine mammals and historical resources.

Take or taking means:

(1) For any marine mammal, sea turtle or seabird listed as either endangered or threatened pursuant to the Endangered Species Act, the term means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect or injure, or to attempt to engage in any such conduct;

(2) For any other marine mammal, sea turtle or seabird, to harass, hunt, capture, kill, collect or injure, or to attempt to
engage in any such conduct.

For the purpose of both paragraphs (1) and (2) of this definition, the term includes, but is not limited to, collecting any dead or injured marine mammal, sea turtle or seabird, or any part thereof; restraining or detaining any marine mammal, sea turtle or seabird, or any part thereof, no matter how temporarily; tagging any sea turtle, marine mammal or seabird; operating a vessel or aircraft or doing any other act that results in the disturbing or molesting of any marine mammal, sea turtle or seabird.

Traditional fishing means fishing using a commercial or recreational fishing method that has been used in the Sanctuary before the effective date of Sanctuary designation, including the retrieval of fishing gear.

Treaty means a formal agreement between the United States Government and an Indian tribe.

Vessel means a watercraft of any description capable of being used as a means of transportation in/on the waters of the Sanctuary.


§ 925.4 Allowed Activities

All activities except those prohibited by § 925.5 may be
undertaken subject to any emergency regulations promulgated pursuant to § 925.6, subject to all prohibitions, restrictions, and conditions validly imposed by any other authority of competent jurisdiction, and subject to the liability established by Section 312 of the Act (see § 925.8).

§ 925.5 Prohibited activities.

(a) Except as specified in paragraphs (c) through (h) of this § 925.5, the following activities are prohibited and thus unlawful for any person to conduct or cause to be conducted:

(1) Exploring for, developing or producing oil, gas or minerals within the Sanctuary.

(2) Discharging or depositing, from within the boundary of the Sanctuary, any material or other matter except:

(i) Fish, fish parts, chumming materials or bait used in or resulting from traditional fishing operations in the Sanctuary;

(ii) Biodegradable effluent incidental to vessel use and generated by marine sanitation devices approved in accordance with Section 312 of the Federal Water Pollution Control Act, as amended, (FWPCA) 33 U.S.C. 1322 et seq.;

(iii) Water generated by routine vessel operations (e.g., cooling water, deck wash down and graywater as defined by Section 312 of the FWPCA) excluding oily wastes from bilge pumping;

(iv) Engine exhaust; or
(v) dredge spoil in connection with beach nourishment projects related to harbor maintenance activities.

(3) Discharging or depositing, from beyond the boundary of the Sanctuary, any material or other matter, except those listed in paragraph (a)(2)(i-v) of this § 925.5, that subsequently enters the Sanctuary and injures a Sanctuary resource or quality.

(4) Moving, removing or injuring, or attempting to move, remove or injure, a Sanctuary historical resource. This prohibition does not apply to moving, removing or injury resulting incidentally from traditional fishing operations.

(5) Drilling into, dredging or otherwise altering the seabed of the Sanctuary; or constructing, placing or abandoning any structure, material or other matter on the seabed of the Sanctuary, except as an incidental result of:

(i) Anchoring vessels;
(ii) Traditional fishing operations;
(iii) Installation of navigation aids;
(iv) Harbor maintenance in the areas necessarily associated with Federal projects in existence on the effective date of Sanctuary designation, including dredging of entrance channels and repair, replacement or rehabilitation of breakwaters and jetties;
(v) Construction, repair, replacement or rehabilitation of docks or piers; or
(vi) Beach nourishment projects related to harbor maintenance activities.
(6) Taking any marine mammal, sea turtle or seabird in or above the Sanctuary, except as authorized by the National Marine Fisheries Service or the United States Fish and Wildlife Service under the authority of the Marine Mammal Protection Act, as amended, (MMPA), 16 U.S.C. 1361 et seq., the Endangered Species Act, as amended, (ESA), 16 U.S.C. 1531 et seq., and the Migratory Bird Treaty Act, as amended, (MBTA), 703 et seq., or pursuant to any treaty with an Indian tribe to which the United States is a party, provided that the treaty right is exercised in accordance with the MMPA, ESA and MBTA.

(7) Flying motorized aircraft at less than 2,000 feet both above the Sanctuary within one nautical mile of the Flattery Rocks, Quillayute Needles, or Copalis National Wildlife Refuge, or within one nautical mile seaward from the coastal boundary of the Sanctuary, except as necessary for valid law enforcement purposes, for activities related to tribal timber operations conducted on reservation lands, or to transport persons or supplies to or from reservation lands as authorized by a governing body of an Indian tribe.

(8) Possessing within the Sanctuary (regardless of where taken, moved or removed from), except as necessary for valid law enforcement purposes, any historical resource, or any marine mammal, sea turtle, or seabird taken in violation of the MMPA, ESA or MBTA.

(9) Interfering with, obstructing, delaying or preventing an investigation, search, seizure or disposition of seized property
in connection with enforcement of the Act or any regulation or permit issued under the Act.

(b) The regulations in this Part apply to foreign persons and foreign vessels in accordance with generally recognized principles of international law, and in accordance with treaties, conventions and other international agreements to which the United States is a party.

(c) The prohibitions in paragraphs (a)(2) through (5), (7) and (8) of this § 925.5 do not apply to activities necessary to respond to emergencies threatening life, property or the environment.

(d)(1) All Department of Defense military activities shall be carried out in a manner that avoids to the maximum extent practicable any adverse impacts on Sanctuary resources and qualities. Except as provided in paragraph d(2) of this § 925.5, the prohibitions in paragraphs (a)(2) through (8) of this § 925.5 do not apply to the following military activities performed by the Department of Defense in W-237A, W237-B, and Military Operating Areas Olympic A and B in the Sanctuary: 1) hull integrity tests and other deep water tests; 2) live firing of guns, missiles, torpedoes, and chaff; 3) activities associated with the Quinault Range including the in-water testing of non-explosive torpedoes; and 4) anti-submarine warfare operations. New activities may be exempted from the prohibitions in paragraphs (a)(2) through (8) of this § 945.5 by the Director or designee after consultation between the Director or designee and
the Department of Defense. If it is determined that an activity may be carried out, such activity shall be carried out in a manner that avoids to the maximum extent practicable any adverse impact on Sanctuary resources and qualities. Civil engineering and other civil works projects conducted by the U.S. Army Corps of Engineers are excluded from the scope of this paragraph (d)(1).

(2) The Department of Defense is prohibited from conducting bombing activities within the Sanctuary.

(3) In the event of threatened or actual destruction of, loss of, or injury to a Sanctuary resource or quality resulting from an untoward incident, including but not limited to spills and groundings caused by the Department of Defense, the Department of Defense shall promptly coordinate with the Director or designee for the purpose of taking appropriate actions to respond to and mitigate the harm and, if possible, restore or replace the Sanctuary resource or quality.

(e) The prohibitions in paragraphs (a)(2) through (8) of this section do not apply to any activity executed in accordance with the scope, purpose, terms and conditions of a National Marine Sanctuary permit issued pursuant to § 925.9 or a Special Use permit issued pursuant to Section 310 of the Act.

(f) The prohibitions in paragraphs (a)(2) through (8) of this § 925.5 do not apply to any activity authorized by a valid lease, permit, license, approval or other authorization in existence on the effective date of Sanctuary designation and
issued by any Federal, State or local authority of competent jurisdiction, or by any valid right of subsistence use or access in existence on the effective date of Sanctuary designation, provided that the holder of such authorization or right complies with § 925.10 and with any terms and conditions on the exercise of such lease, permit, license, other authorization or right imposed by the Director or designee as a condition of certification as he or she deems necessary to achieve the purposes for which the Sanctuary was designated.

(g) The prohibitions in paragraphs (a)(2) through (8) of § 925.5 do not apply to any activity authorized by any lease, permit, license, or other authorization issued after the effective date of Sanctuary designation and issued by any Federal, State or local authority of competent jurisdiction, provided that the applicant complies with § 925.11, the Director or designee notifies the applicant and authorizing agency that he or she does not object to issuance of the authorization, and the applicant complies with any terms and conditions the Director or designee deems necessary to protect Sanctuary resources and qualities. Amendments, renewals and extensions of authorizations in existence on the effective date of designation constitute authorizations issued after the effective date.

(h) Notwithstanding paragraphs (e) and (g) of this § 925.5, in no event may the Director or designee issue a National Marine Sanctuary permit under § 925.9 or a Special Use permit under Section 310 of the Act authorizing, or otherwise approve: the
exploration for, development or production of oil, gas or minerals within the Sanctuary; the discharge of primary-treated sewage within the Sanctuary (except by certification, pursuant to § 925.10, of valid authorizations in existence on the effective date of Sanctuary designation and issued by other authorities of competent jurisdiction); the disposal of dredged material within the Sanctuary other than in connection with beach nourishment projects related to harbor maintenance activities; or bombing activities within the Sanctuary. Any purported authorizations issued by other authorities after the effective date of Sanctuary designation for any of these activities within the Sanctuary shall be invalid.

§ 925.6 Emergency regulations.

Where necessary to prevent or minimize the destruction of, loss of, or injury to a Sanctuary resource or quality, or minimize the imminent risk of such destruction, loss or injury, any and all activities are subject to immediate temporary regulation, including prohibition.

§ 925.7 Penalties for violations of regulations.

(a) Each violation of the Act, any regulation in this Part, or any permit issued pursuant thereto, is subject to a civil penalty of not more than $100,000. Each day of a continuing violation constitutes a separate violation.

(b) Regulations setting forth the procedures governing
administrative proceedings for assessment of civil penalties, permit sanctions and denials for enforcement reasons, issuance and use of written warnings, and release or forfeiture of seized property appear in 15 CFR Part 904.

§ 925.8 Response costs and damages.

Under Section 312 of the Act, any person who destroys, causes the loss of, or injures any Sanctuary resource is liable to the United States for response costs and damages resulting from such destruction, loss or injury, and any vessel used to destroy, cause the loss of, or injure any Sanctuary resource is liable in rem to the United States for response costs and damages resulting from such destruction, loss or injury.

§ 925.9 National Marine Sanctuary permits - application procedures and issuance criteria.

(a) A person may conduct an activity prohibited by paragraphs (a)(2) through (8) of § 925.5 if conducted in accordance with the scope, purpose, terms and conditions of a permit issued under this § 925.9.

(b) Applications for such permits should be addressed to the Director of the Office of Ocean and Coastal Resource Management; Attn: Sanctuaries and Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration, 1305 East-West Highway, Building 4, Silver Spring, MD 20910. An application must include
a detailed description of the proposed activity including a
timetable for completion of the activity and the equipment,
personnel and methodology to be employed. The qualifications and
experience of all personnel must be set forth in the application.
The application must set forth the potential effects of the
activity on Sanctuary resources and qualities. Copies of all
other required licenses, permits, approvals or other
authorizations must be attached.

(c) Upon receipt of an application, the Director or designee
may request such additional information from the applicant as he
or she deems necessary to act on the application and may seek the
views of any persons.

(d) The Director or designee, at his or her discretion, may
issue a permit, subject to such terms and conditions as he or she
deems appropriate, to conduct an activity prohibited by
paragraphs (a)(2) through (8) of § 925.5, if the Director or
designee finds that the activity will have only negligible
short-term adverse effects on Sanctuary resources and qualities
and will: further research related to Sanctuary resources and
qualities; further the educational, natural or historical
resource value of the Sanctuary; further salvage or recovery
operations in or near the Sanctuary in connection with a recent
air or marine casualty; assist in managing the Sanctuary; or
further salvage or recovery operations in connection with an
abandoned shipwreck in the Sanctuary title to which is held by
the State of Washington. In deciding whether to issue a permit,
the Director or designee may consider such factors as: the professional qualifications and financial ability of the applicant as related to the proposed activity; the duration of the activity and the duration of its effects; the appropriateness of the methods and procedures proposed by the applicant for the conduct of the activity; the extent to which the conduct of the activity may diminish or enhance Sanctuary resources and qualities; the cumulative effects of the activity; the end value of the activity; and the effect of the activity on adjacent Indian tribes. The Director or designee may also deny a permit application pursuant to this § 925.9, in whole or in part, if it is determined that the permittee or applicant has acted in violation of the terms or conditions of a permit or of these regulations. (Procedures governing permit denials for enforcement reasons are set forth in Subpart D of 15 CFR Part 904). In addition, the Director or designee may consider such other factors as he or she deems appropriate.

(e) A permit issued pursuant to this § 925.9 is nontransferable.

(f) The Director or designee may amend, suspend or revoke a permit issued pursuant to this section for good cause. Any such action shall be communicated in writing to the permittee or applicant by certified mail and shall set forth the reason(s) for the action taken. Procedures governing permit sanctions for enforcement reasons are set forth in Subpart D of 15 CFR Part 904.
(g) It shall be a condition of any permit issued that the permit or a copy thereof be displayed on board all vessels or aircraft used in the conduct of the activity.

(h) The Director or designee may, inter alia, make it a condition of any permit issued that any data or information obtained under the permit be made available to the public.

(i) The Director or designee may, inter alia, make it a condition of any permit issued that a NOAA official be allowed to observe any activity conducted under the permit and/or that the permit holder submit one or more reports on the status, progress or results of any activity authorized by the permit.

(j) The Director or designee shall consult with the governing body of an Indian Tribe prior to issuing a permit, if the proposed activity involves or affects resources of cultural or historical significance to the tribe.

(k) The applicant for or holder of a National Marine Sanctuary permit may appeal the denial, conditioning, amendment, suspension or revocation of the permit in accordance with the procedures set forth in § 925.12.

§ 925.10 Certification of pre-existing leases, licenses, permits, approvals, other authorizations or rights to conduct a prohibited activity.

(a) the prohibitions set forth in paragraphs (a)(2) through (8) of § 925.5 do not apply to any activity authorized by a valid lease, permit, license, approval or other authorization in
existence on the effective date of Sanctuary designation and issued by any Federal, State or local authority of competent jurisdiction, or by any valid right of subsistence use or access in existence on the effective date of Sanctuary designation, provided that: 1) The holder of such authorization or right notifies the Director or designee, in writing, within 90 days of the effective date of Sanctuary designation, of the existence of such authorization or right and requests certification of such authorization or right; 2) The holder complies with the other provisions of this § 925.10; and 3) The holder complies with any terms and conditions on the exercise of such authorization or right imposed as a condition of certification by the Director or designee to achieve the purposes for which the Sanctuary was designated.

(b) The holder of a valid lease, permit, license, or other authorization in existence on the effective date of sanctuary designation and issued by any Federal, State or local authority of competent jurisdiction, or of any valid right of subsistence use or access in existence on the effective date of Sanctuary designation, authorizing an activity prohibited by paragraphs (a)(2) through (8) of § 925.5 may conduct the activity without being in violation of § 925.5, pending final agency action on his or her certification request, provided the holder is in compliance with this § 925.10.

(c) Any holder of a valid lease, permit, license, or other authorization in existence on the effective date of Sanctuary
designation and issued by any Federal, State or local authority of competent jurisdiction, or any holder of a valid right of subsistence use or access in existence on the effective date of Sanctuary designation, may request the Director or designee to issue a finding as to whether the activity for which the authorization has been issued, or the right given is prohibited by (a)(1) through (8) of § 925.5.

(d) Requests for findings or certifications should be addressed to the Director, Office of Ocean and Coastal Resource Management; Attn: Sanctuaries and Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration, 1305 East-West Highway, Building 4, Silver Spring, MD 20910. A copy of the lease, permit, license, or other authorization must accompany the request.

(e) The Director or designee may request additional information from the certification requester as he or she deems necessary to condition appropriately the exercise of the certified authorization or right to achieve the purposes for which the Sanctuary was designated. The information requested must be received by the Director or designee within 45 days of the postmark date of the request. The Director or designee may seek the views of any persons on the certification request.

(f) The Director or designee may amend any certification made under this § 925.10 whenever additional information becomes available justifying such an amendment.
(g) The Director or designee shall communicate any decision on a certification request or any action taken with respect to any certification made under this § 925.10, in writing, to both the holder of the certified lease, permit, license, approval, other authorization or right, and the issuing agency, and shall set forth the reason(s) for the decision or action taken.

(h) Any time limit prescribed in or established under this § 925.10 may be extended by the Director or designee for good cause.

(i) The holder may appeal any action conditioning, amending, suspending or revoking any certification in accordance with the procedures set forth in § 925.12.

(j) Any amendment, renewal or extension not in existence on the effective date of Sanctuary designation of permit, license, approval, other authorization or right is subject to the provisions of § 925.11.

§ 925.11 Notification and review of applications for leases, licenses, permits, or other authorizations to conduct a prohibited activity.

(a) The prohibitions set forth in paragraphs (a)(2) through (8) of § 925.5 do not apply to any activity authorized by any valid lease, permit, license, or other authorization issued after the effective date of Sanctuary designation by any Federal, State or local authority of competent jurisdiction, provided that: 1) The applicant notifies the Director or designee, in writing, of
the application for such authorization (and of any application for an amendment, renewal or extension of such authorization) within fifteen (15) days of the date of application or of the effective date of Sanctuary designation, whichever is later; 2) The applicant complies with the other provisions of this § 925.11; 3) The Director or designee notifies the applicant and authorizing agency that he or she does not object to issuance of the authorization (or amendment, renewal or extension); and 4) The applicant complies with any terms and conditions the Director or designee deems necessary to protect Sanctuary resources and qualities.

(b) Any potential applicant for a lease, permit, license or other authorization from any Federal, State or local authority (or for an amendment, renewal or extension of such authorization) may request the Director or designee to issue a finding as to whether the activity for which an application is intended to be made is prohibited by paragraphs (a)(2) through (4) of § 925.5.

(c) Notifications of filings of applications and requests for findings should be addressed to the Director, Office of Ocean and Coastal Resource Management; ATTN: Sanctuaries and Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration, 1305 East West Highway, Building 4, Silver Spring, MD 20910. A copy of the application must accompany the notification.

(d) The Director or designee may request additional
information from the applicant as he or she deems necessary to determine whether to object to issuance of such lease, license, permit, or other authorization (or to issuance of an amendment, extension or renewal of such authorization), or what terms and conditions are necessary to protect Sanctuary resources and qualities. The information requested must be received by the Director or designee within 45 days of the postmark date of the request. The Director or designee may seek the views of any persons on the application.

(e) The Director or designee shall notify, in writing, the agency to which application has been made of his or her review of the application and possible objection to issuance. After review of the application and information received with respect thereto, the Director or designee shall notify both the agency and applicant, in writing, whether he or she has an objection to issuance and what terms and conditions he or she deems necessary to protect Sanctuary resources and qualities. The Director or designee shall state the reason(s) for any objection or the reason(s) that any terms and conditions are deemed necessary to protect Sanctuary resources and qualities.

(f) The Director or designee may amend the terms and conditions deemed necessary to protect Sanctuary resources and qualities whenever additional information becomes available justifying such an amendment.

(g) Any time limit prescribed in or established under this section may be extended by the Director or designee for good
(h) The applicant may appeal any objection by, or terms or conditions imposed by, the Director or designee to the Assistant Administrator or designee in accordance with the procedures set forth in § 925.12.

§ 925.12 Appeals of administrative action.

(a) Except for permit actions taken for enforcement reasons (see Subpart D of 15 CFR Part 904 for applicable procedures), an applicant for, or a holder of, a § 925.9 National Marine Sanctuary permit, an applicant for, or a holder of, a Section 310 of the Act Special Use permit, a § 925.10 certification requester or a § 925.11 applicant (hereinafter appellant) may appeal to the Assistant Administrator or designee:

1) The grant, denial, conditioning, amendment, suspension or revocation by the Director or designee of a National Marine Sanctuary or Special Use permit;

2) The conditioning, amendment, suspension or revocation of a certification under § 925.10; or

3) The objection to issuance or the imposition of terms and conditions under § 925.11.

(b) An appeal under paragraph (a) of this § 925.12 must be in writing, state the action(s) by the Director or designee appealed and the reason(s) for the appeal, and be received within 30 days of receipt of notice of the action by the Director or designee. Appeals should be addressed to the Assistant

(c) While the appeal is pending, appellants requesting certification pursuant to § 925.10 who are in compliance with such section may continue to conduct their activities without being in violation of the prohibitions in paragraphs (a) (2) through (8) of § 925.5 with regard to which they are requesting certification. All other appellants may not conduct their activities without being subject to the prohibitions in paragraphs (a) (1) through (9) of § 925.5.

(d) The Assistant Administrator or designee may request the appellant to submit such information as the Assistant Administrator or designee deems necessary in order for him or her to decide the appeal. The information requested must be received by the Assistant Administrator or designee within 45 days of the postmark date of the request. The Assistant Administrator may seek the views of any other persons. The Assistant Administrator or designee may hold an informal hearing on the appeal. If the Assistant Administrator or designee determines that an informal hearing should be held, the Assistant Administrator or designee may designate an officer before whom the hearing shall be held. The hearing officer shall give notice in the Federal Register of the time, place and subject matter of the hearing. The appellant
and the Director or designee may appear personally or by counsel at the hearing and submit such material and present such arguments as deemed appropriate by the hearing officer. Within 60 days after the record for the hearing closes, the hearing officer shall recommend a decision in writing to the Assistant Administrator or designee.

(e) The Assistant Administrator or designee shall decide the appeal using the same regulatory criteria as for the initial decision and shall base the appeal decision on the record before the Director or designee and any information submitted regarding the appeal, and, if a hearing has been held, on the record before the hearing officer and the hearing officer's recommended decision. The Assistant Administrator or designee shall notify the appellant of the final decision and the reason(s) therefore in writing. The Assistant Administrator or designee's decision shall constitute final agency action for the purposes of the Administrative Procedure Act.

(f) Any time limit prescribed in or established under this § 925.12 other than the 30-day limit for filing an appeal may be extended by the Assistant Administrator, designee or hearing officer for good cause.
Appendix I To Part 925 - Olympic Coast National Marine Sanctuary

Boundary Coordinates. (Based on North American Datum of 1983).

2500 square nautical miles

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An Evaluation of Western Washington Coastal Marine Areas and Adjacent Lands: Special Report
Information Pertinent to Site Selection for the Proposed Olympic Coast National Marine Sanctuary:

An Evaluation of Western Washington Coastal Marine Areas and Adjacent Lands

Strategic Assessment Branch
National Oceanic and Atmospheric Administration
Office of Oceanography and Marine Assessment
6001 Executive Blvd., N/OMA31
Rockville, MD 20852
(301)443-8843

August, 1990

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A national marine sanctuary for the outer coast of the State of Washington has been mandated by the U.S. Congress. To identify the best possible site(s) for this sanctuary, an extensive region along Washington's coast was studied. The following is a presentation of material used to examine that region.

Included in this presentation are:
- A general description of the study region;
- Maps of pertinent information;
- An analysis of living marine resources that occur and are utilized off Washington; and
- Additional information describing various features of coastal lands adjacent to the study region (e.g., land uses, pollution discharges, demographics, etc.).

Information pertinent to areas under consideration for marine sanctuary status are arranged in sections. Within each section are associated figures and tables, and a "major features" page which summarizes notable material. Support material for findings presented in each section are listed in accompanying data appendices. In combination, these material provide a comprehensive examination of the outer coast of Washington and its resources.

Description of the Study Region

The study region is a nearly 6,000 sq mi (square statute mile) area of the Pacific Northwest. It extends from the USA-Canada boundary at the mouth of the Strait of Juan De Fuca southward to the Washington shoreline at Koitlah Point, and from there along the shoreline to Cape Disappointment at the mouth of the Columbia River (Map 2). From Cape Disappointment, the region's boundary extends seaward to the continental shelf edge (100 fathom isobath) and then northward along the shelf edge to the Juan De Fuca Canyon (not indicated) and the USA-Canada boundary. Included in the study region are canyons off the southern and central portions of the coast, and a deep-water area known as "the plain" at the head of Juan De Fuca Canyon. The study region stops at the mean low water line and at stream/river mouths along the coast of Native American Tribal lands, but extends landward to the mean high tide line and upstream to the limit of tidal influence along the remaining coast.

Area Descriptions. The study region was divided into seven areas to comparatively examine information for various segments of the marine region (Map 1), and note important sanctuary-related characteristics for each area.

<table>
<thead>
<tr>
<th>Study Area</th>
<th>Area Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>An area at the head of the Juan De Fuca Canyon, including &quot;the plain&quot; and a small coastal area from Cape Flattery to Koitlah Point. It is bounded on the north by the USA-Canada marine boundary; on the east by a line extending from the USA-Canada line down to Koitlah Point; on the south from Cape Flattery to a point 3 n mi (nautical miles) offshore and then southwestward along the 100 fm isobath to the edge of the Juan De Fuca Canyon (about 35 n mi offshore); and on the west by a line extending northwestward to the USA-Canada boundary, approximately 40 n mi off Cape Flattery. Its surface area is roughly 1,000 sq mi.</td>
</tr>
<tr>
<td>2</td>
<td>An offshore, deep water area that extends from 3 n mi off Cape Flattery southwestward along the 50 fm isobath to a line extending seaward from the southern boundary of the Copalis National Wildlife Refuge at the mouth of the Copalis River (not shown), but at Lat. 47° 07' N, seaward along the line to the 100 fm isobath, and northward along the 100 fm curve to about 3 n mi off Cape Flattery. Also included is a portion of the canyon off the Quinault River. The surface area of this study area is about 1,050 sq mi.</td>
</tr>
<tr>
<td>Area</td>
<td>Area Description</td>
</tr>
<tr>
<td>------</td>
<td>------------------</td>
</tr>
<tr>
<td>3</td>
<td>The northern intermediate depth area shoreward of Area 2, extending out from 3 n mi off the coast out to the 50 fm isobath from off Cape Flattery south to the line extending seaward from the Copalis River mouth. It has a surface area of about 890 sq s mi.</td>
</tr>
<tr>
<td>4</td>
<td>An inshore area extending along the coast from Cape Flattery south to the southern boundary of the Copalis National Wildlife Refuge, and offshore to 3 n. mi. Most waters in this area are shallower than 20 fm, and the study area's surface area is about 521 sq s mi. Clallam County, Jefferson County, and a portion of Grays Harbor County are found shoreward of this study area, and rivers and streams which drain into this study area occur within the USGS (US Geological Survey) Estuarine Cataloging Units 17100101 and 102 (Map 3).</td>
</tr>
<tr>
<td>5</td>
<td>An offshore area between the 50 fm and 100 fm isobaths from the southern border of Area 2 southward to a line extending seaward from Cape Disappointment. This study area also includes a portion of the Grays Harbor Canyon and has a total surface area of nearly 1,100 sq s mi.</td>
</tr>
<tr>
<td>6</td>
<td>The southern intermediate depth study area between the 50 fm isobath and a line 3 n mi off the coast, from the southern boundary of Area 3 to the line extending seaward from Cape Disappointment. It has a total surface area of about 915 sq s mi.</td>
</tr>
<tr>
<td>7</td>
<td>The southern coastal area extending landward from 3 n mi offshore between the southern boundary of Area 4 and Cape Disappointment. This study area includes the significant estuaries of Grays Harbor and Willapa Bay and has a total surface area of about 400 sq s mi. Rivers and streams which drain into this study area occur within the USGS Estuarine Cataloging Units 17100104, 105, and 106 (Grays Harbor and Willapa Bay Estuarine Drainage Areas on Map 3).</td>
</tr>
</tbody>
</table>
LAND USE
• Lands adjacent to the study region are undeveloped, although logging is significant.

• Nearly all adjacent land is forested (94%). (See Figure 1.)

• Of the non-forested area, most is utilized for urban purposes, agriculture, and wetlands (each comprises about 2% of the total area in coastal counties).
Figure 1. Land use for counties adjacent to the area under consideration for the Coastal Washington Marine Sanctuary.

FRESHWATER INFLOW
When compared to other regions of the contiguous West Coast, freshwater flow from lands adjacent to the study region is relatively small.

The Chehalis River, which discharges into Grays Harbor, has the largest flow of any river emptying into the study region, but its long-term average flow is only about 2.5% of that for the Columbia River (Figure 2). (Measured upstream from a major Columbia River tributary, the Willamette River).

Despite low overall amounts of freshwater flowing into the study region, volumes per square mile of drainage basin are high. High volumes per unit area result from small drainage basins with high rainfall and steep terrain.

An example of high freshwater yield per unit area is the Quinault River which empties into Study Area 4. It ranks first in water yield (10.77 cfs per sq mi) for the 47 West Coast rivers that have been inventoried by NOAA. In contrast, the Columbia River ranks 40th (0.80 cfs per sq mi).

Flows and yields for several rivers discharging into the study region are presented in Appendix B, Table B.1; "cfs" is cubic feet per second.
Figure 2. Freshwater discharges into study region waters.

Source: Personal communication with Steve Rohmann, Strategic Assessment Branch, OMA/NOAA.

(1) Information for Columbia River included for comparison purposes.
POLLUTION DISCHARGES
Because of the undeveloped nature of land adjacent to areas under consideration for marine sanctuary, the entire study region is relatively unspoiled.

Pollution from traditional sources (i.e., wastewater treatment plants, industry and urban runoff, etc.) is low (Figure 3).

There are no major industrial polluters within Area 4, and only seven in Area 7. (See Table C.2 in Appendix C.).

An exception to low pollution throughout the study region is the discharge from two pulp and paper mills in Area 7.

Pesticide use along coastal Washington is very low relative to other areas of the West Coast (Figure 4).

Summaries of pollution discharges for total volumes of nitrogen, lead, and all suspended solids combined indicate that with the exception of suspended solids discharged by paper mills, the greatest source of pollutants into study region waters is from background material in natural forest runoff (Figures 5-7). Information for these pollutants and seven others are presented in Table C.1 of Appendix C.

Note: the above information relates to data from the early 1980s. More recently, there are indications that logging activity may have expanded considerably. Increases in logging of these lands would substantially increase many pollutant discharges, especially from clear cutting along river banks and estuary shorelines.
Figure 3. Pollution discharges by source (as percentage of U.S. West Coast totals) in counties adjacent to areas under consideration for the Coastal Washington Marine Sanctuary.

Source: Strategic Assessment Branch, NOAA, 1984: The National Coastal Pollutant Discharge Inventory, Rockville, MD.

Figure 4. Pesticide use per year in West Coast states and on lands adjacent to areas under consideration for the Coastal Washington Marine Sanctuary.

Source: Strategic Assessment Branch, NOAA, 1984: The National Coastal Pollutant Discharge Inventory, Rockville, MD.
Figure 5. Total nitrogen discharged into counties adjacent to areas under consideration for the Coastal Washington Marine Sanctuary by source (as a percentage of the U.S. West Coast).

Source: Strategic Assessment Branch, NOAA, 1984: The National Coastal Pollutant Discharge Inventory, Rockville, MD.

Figure 6. Total lead discharged into counties adjacent to areas under consideration for the Coastal Washington Marine Sanctuary, by source (as a percentage of U.S. West Coast discharges).

Source: Strategic Assessment Branch, NOAA, 1984: The National Coastal Pollutant Discharge Inventory, Rockville, MD.
Figure 7. Total volume of all suspended solids discharged into counties adjacent to areas under consideration for the Coastal Washington Marine Sanctuary by source (expressed as a percentage of the U.S. West Coast total).

Source: Strategic Assessment Branch, NOAA, 1984: The National Coastal Pollutant Discharge Inventory, Rockville, MD.
SOCIO-ECONOMIC PROFILE
V Socio-Economic Coastal Characteristics

- The human population within coastal areas adjacent to the sanctuary study region is low, slowly growing, and is projected to remain so (Figure 8).

- Most people in the study area are employed in manufacturing, whereas in all other coastal counties in the USA, most employment is in services (Figure 9). This is primarily the result of pulp and paper manufacturing and commercial fishing in the study region.

- Unemployment is high relative to most other areas in the Nation (Figure 10). This reflects seasonal employment associated with fishing, timber, and tourism.

- New construction in the area is low (Figure 11).

- Although similar to most other areas in Washington (Figure 12) property values for lands adjacent to the sanctuary study region are much lower than property values for other regions of the Coastal USA.

- Large tracts of land are publicly owned (e.g., 74% of Clallam and Jefferson counties).

- Counties adjacent to the study region contain only 16% of the total number of public recreation areas in the state of Washington, but these represent nearly 70% of statewide publicly owned acreage (Figure 13).

- There is a large tourist industry in the study area. For example, the Olympic National Park alone generates $60 million annually.

- The fishing industry is extremely important in the study region. Nearly two-thirds of the poundage and 37% of the value for Washington's commercial fisheries come from harvests within the sanctuary study region (Tables 1 and 2). (These statistics are for 1987 and 1988, and do not reflect landings from off other states and British Columbia. Detailed catch statistics are presented in Appendix E.)
Figure 8. Population change for counties adjacent to areas under consideration for the Coastal Washington Marine Sanctuary, the State of Washington, the U.S. West Coast, and the entire coastal USA.

Figure 9. Employment by job sector for the counties adjacent to areas under consideration for the Coastal Washington Marine Sanctuary, the State of Washington, the U.S. West Coast, and the entire coastal USA.


Figure 10. Annual unemployment for the counties adjacent to the areas under consideration for the Coastal Washington Marine Sanctuary, Washington coastal counties, the U.S. West Coast, and the entire coastal USA.

Figure 11. Construction permits (all types) by region and year, 1985-1989, in the counties adjacent to areas under consideration for the Coastal Washington Marine Sanctuary, the State of Washington, the U.S. West Coast, and the entire coastal USA.


Figure 12. Average county real estate value for the counties adjacent to areas under consideration for the Coastal Washington Marine Sanctuary, the State of Washington, the U.S. West Coast, and the entire coastal USA.

Figure 13a. Number of public recreational facilities adjacent to areas considered for the Coastal Washington Marine Sanctuary, and the entire state of Washington.

Figure 13b. Acreage of public recreational facilities adjacent to areas considered for the Coastal Washington Marine Sanctuary, and for the entire state of Washington.

Table 1. Estimates of values and volumes for commercial harvests in the state of Washington (1) (2).

<table>
<thead>
<tr>
<th>Species</th>
<th>Landed value</th>
<th>Pounds landed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sockeye salmon **</td>
<td>$20,593,593</td>
<td>8,620,521</td>
</tr>
<tr>
<td>Coho salmon **</td>
<td>18,655,221</td>
<td>10,485,109</td>
</tr>
<tr>
<td>Chum salmon **</td>
<td>18,361,898</td>
<td>15,973,980</td>
</tr>
<tr>
<td>Chinook salmon **</td>
<td>16,586,065</td>
<td>8,454,675</td>
</tr>
<tr>
<td>Dungeness crab *</td>
<td>13,593,309</td>
<td>11,600,271</td>
</tr>
<tr>
<td>Pacific oyster **</td>
<td>10,991,082</td>
<td>8,606,887</td>
</tr>
<tr>
<td>Ocean pink shrimp</td>
<td>6,176,103</td>
<td>13,459,058</td>
</tr>
<tr>
<td>Sea urchins</td>
<td>5,749,167</td>
<td>6,224,967</td>
</tr>
<tr>
<td>Sablefish</td>
<td>4,447,218</td>
<td>6,127,331</td>
</tr>
<tr>
<td>Geoduck *</td>
<td>2,948,037</td>
<td>4,535,442</td>
</tr>
<tr>
<td>Manila clam *</td>
<td>2,926,049</td>
<td>3,506,203</td>
</tr>
<tr>
<td>Pacific cod</td>
<td>1,903,630</td>
<td>6,439,232</td>
</tr>
<tr>
<td>Widow rockfish</td>
<td>1,880,523</td>
<td>6,146,421</td>
</tr>
<tr>
<td>Yellowtail rockfish</td>
<td>1,291,100</td>
<td>4,306,187</td>
</tr>
<tr>
<td>Rockfish spp.</td>
<td>1,102,119</td>
<td>4,735,237</td>
</tr>
<tr>
<td>Others</td>
<td>13,053,223</td>
<td>4,691,591</td>
</tr>
<tr>
<td>** Total</td>
<td>$140,258,337</td>
<td>123,913,112 lbs.</td>
</tr>
</tbody>
</table>

Table 2. Estimates of values and volumes for commercial harvests in areas under consideration for the proposed coastal Washington marine sanctuary (1).

<table>
<thead>
<tr>
<th>Species</th>
<th>Landed value</th>
<th>Pounds landed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dungeness crab *</td>
<td>$11,407,311</td>
<td>9,771,405</td>
</tr>
<tr>
<td>Pacific oyster **</td>
<td>7,551,846</td>
<td>5,930,458</td>
</tr>
<tr>
<td>Ocean pink shrimp</td>
<td>7,208,086</td>
<td>13,460,058</td>
</tr>
<tr>
<td>Chinook salmon **</td>
<td>5,052,149</td>
<td>2,593,888</td>
</tr>
<tr>
<td>Sablefish</td>
<td>4,407,200</td>
<td>6,119,654</td>
</tr>
<tr>
<td>Coho salmon *</td>
<td>3,039,474</td>
<td>1,547,717</td>
</tr>
<tr>
<td>Chum salmon **</td>
<td>1,927,083</td>
<td>1,681,745</td>
</tr>
<tr>
<td>Widow rockfish</td>
<td>1,880,523</td>
<td>6,146,421</td>
</tr>
<tr>
<td>Pacific cod</td>
<td>1,172,195</td>
<td>4,022,983</td>
</tr>
<tr>
<td>Albacore</td>
<td>1,090,613</td>
<td>1,320,249</td>
</tr>
<tr>
<td>Dover sole</td>
<td>956,236</td>
<td>3,745,539</td>
</tr>
<tr>
<td>Petrale sole</td>
<td>686,334</td>
<td>918,160</td>
</tr>
<tr>
<td>Lingcod *</td>
<td>636,334</td>
<td>1,898,565</td>
</tr>
<tr>
<td>Arrowtooth flounder</td>
<td>498,242</td>
<td>3,492,503</td>
</tr>
<tr>
<td>Others</td>
<td>4,676,854</td>
<td>19,942,025</td>
</tr>
<tr>
<td>** Total</td>
<td>$52,190,480</td>
<td>82,591,370 lbs.</td>
</tr>
</tbody>
</table>

(2) Washington landings from other state's waters and from off British Columbia are excluded.
* Estuarine Associated Species (i.e., uses estuaries during one or more life stages)
** Estuarine Dependent Species (i.e., requires estuaries during one or more life stages)

Sources:
PacFIN. 1989. PFMC source report #002: Commercial groundfish landed catch (mt) for 1981-88, all areas. Seattle, WA.
INVERTEBRATES
Both the comparative significance analysis of species distributions (Table 3) and the distributions analysis weighted by species abundance (Table 4) reveal that the inshore Areas 4 and 7 are the most important areas in the study region.

Areas 4 and 7 contain beaches where the majority of the entire U.S. West Coast recreational harvests of razor clams are taken. An average of over 7.5 million razor clams were taken by nearly 1 million recreational clam diggers during 1960s and 1970s. More recently, razor clam populations have been reduced in size in Washington (due to disease); however, harvests from Washington beaches still account for about 70% of contiguous West Coast recreational catches (e.g., 6.2 million clams of the 8.7 million clams total for 1988 and 1989, combined).

Areas 4 and 7 include Grays Harbor and Willapa Bay where harvests of Pacific oysters can account for over half of all oysters harvested along the entire U.S. West Coast. Harvests in these estuaries sometimes represent nearly one-fifth of nationwide harvests (Figure 14).

More than three-quarters of the state’s Dungeness crab catch is taken in Areas 4 and 7 and the shallow, shoreward portions of Areas 3 and 6.

Pacific oyster, Dungeness crab, and ocean pink shrimp landings from areas under consideration for sanctuary status had combined landed values in 1987-88 of over $25 million (about 85% of statewide totals for harvests of these species off Washington).

In addition to the significance of oyster harvests, landings for other shellfish in the study region represent:

-- 32% of all contiguous US West Coast commercial crab harvests (1985-88 data);
-- About 25% of all shrimp harvests (1985-88 data); and

Note: Also see Tables 1 and 2 (Commercial landings and values...) in Section V, Socio-economic Coastal Characteristics.
Table 3. Comparative significance of study areas based on the distributions of selected invertebrate species occurring off Washington.

<table>
<thead>
<tr>
<th>INVERTEBRATES</th>
<th>Area 1</th>
<th>Area 2</th>
<th>Area 3</th>
<th>Area 4</th>
<th>Area 5</th>
<th>Area 6</th>
<th>Area 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weathervane Scallop</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Pacific Oyster 1/</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Pacific Geoduck</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Fat Gaper</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Pacific Gaper</td>
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</tr>
<tr>
<td>Pacific Razor 2/</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Pacific Littleneck</td>
<td></td>
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<tr>
<td>Manila Clam</td>
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<td></td>
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<tr>
<td>Pinto Abalone</td>
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<tr>
<td>Giant Octopus</td>
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<tr>
<td>Market Squid</td>
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<td></td>
</tr>
<tr>
<td>Red Squid</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Northern Pink Shrimp</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Ocean Pink Shrimp 1/</td>
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</tr>
<tr>
<td>Sidestripe Shrimp</td>
<td></td>
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</tr>
<tr>
<td>Coonstripe Shrimp</td>
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<tr>
<td>Spot Shrimp</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Bairdi Tanner Crab</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Dungeness Crab 1/</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Point Totals 3/:

|   | 21 | 15 | 16 | 25 | 14 | 17 | 27 |

Legend:
- O Not Significant = 1
- ¶ Significant = 2
- ¶ Very Significant = 3

(Significance relative to species distribution along the contiguous U.S. West Coast)

1/ Commercially Important in Study Region.
2/ Recreationally Important in Study Region.
3/ A summary of point values (i.e. significance) associated with all species within an area.

Table 4. Comparative significance of study areas based on the relative abundance and importance of selected invertebrate species occurring off Washington.

<table>
<thead>
<tr>
<th>INVERTEBRATES</th>
<th>Density Index</th>
<th>Area 1</th>
<th>Area 2</th>
<th>Area 3</th>
<th>Area 4</th>
<th>Area 5</th>
<th>Area 6</th>
<th>Area 7</th>
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</thead>
<tbody>
<tr>
<td>Weathered Scallop</td>
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<td>4</td>
<td>4</td>
<td>8</td>
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<tr>
<td>Pacific Oyster</td>
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<td></td>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>Pacific Geoduck</td>
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<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Fat Gaper</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
<td>9</td>
<td></td>
<td></td>
<td>9</td>
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<tr>
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<td></td>
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<tr>
<td>Market Squid</td>
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<td>8</td>
<td>8</td>
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<tr>
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| Area (column) Total      | 71            | 78     | 88     | 94     | 77     | 87     | 120    |

Legend:
Density Index: Defined as the relative density or abundance of the species, based on commercial and recreational harvests. Rated 1 - 10, with 1 = rare, and 10 = highly abundant.

Key for Areas 1 - 7:
21 - 30 = Very Significant. Species has broad areal coverage of the analysis area, and/or is abundant.
11 - 20 = Significant. Species has some areal coverage, and/or is present in some abundance.
0 - 10 = Not Significant. Species is either present or only occasionally occurs there; low, if any, abundance.

Source: Strategic Assessment Branch (SAB) analysis of the State of Washington commercial and recreational catch statistics in relation to species distribution maps in the NOAA West Coast of North America, Coastal and Ocean Zones Strategic Assessment: Data Atlas, Invertebrate and Fish pre-publication volume. NOAA, SAB, Rockville, MD.
Figure 14. Percent of annual U.S. West Coast oyster harvests and nationwide harvests occurring in Willapa Bay.

Source:
Razor clams and the outer coast of Washington

The clam industry in Washington produces about 95% of U.S. West Coast landings. Although it now accounts for only a small fraction of harvest volumes nationwide, Washington was the leader of clam harvests for many years primarily because of its innovations in canning. Clams have always been a part of Washington culture, especially such species as the Pacific geoduck (or geoduck) and the razor clam. Harvests of the former comprise a significant portion of current commercial harvests, and the latter is the paramount recreational bivalve for the west coast of North America.

Razor clams are found primarily on open coast, sandy beaches of Study Area 17; many occur on Area 4 beaches also. This species normally occurs from low intertidal water out to about depths of about 30 feet, and mostly from the low tide line to depths of less than 10 feet.

Since the 1960s, most razor clams have been taken by recreational diggers. During 1969-1974, annual recreational harvests for the contiguous West Coast averaged about 9.5 million clams; about 80% came from Washington beaches. Recreational harvests in Washington ranged between 7 million and 15 million clams at that time, but pathogen infestations and other natural calamities during the early 1980s severely decimated razor clam populations along Washington's coast. Since that time, populations have recovered somewhat and recreational digging has resumed. During 1988-89, about 3 million razor clams were annually taken by recreational diggers along Washington's coast; this amount represents over 70% of contiguous coastwide U.S. sport harvests.

Although extensive earlier this century, commercial harvests of razor clams now are minor in Washington. Annual harvests peaked at 3.2 million pounds of meats in 1915 and still averaged about 2 million pounds during the 1930s, but harvests substantially declined thereafter. By the 1970s, commercial harvests annually averaged less than 270,000 pounds; this reduced volume reflected natural and human-caused population declines, as well as ever-increasing recreational harvests. Harvests dropped to only a few thousand pounds annually by the early 1980s due to a variety of problems: El Nino-related temperature changes, the Mt. St. Helens eruption, and diseases. The resurgence of coastal Washington razor clam populations during the latter 1980s did not signal the return of notable commercial harvests; recreational harvest is now dominate human use.

Sources:


Personal communication from D. Simons, Wash. Dep. of Fisheries, Montesano, WA.

Personal communication from T. Link, Oregon Dep. of Fisheries and Wildlife, Astoria, OR.
FISH
Table 5. Comparative significance of study areas based on the distribution of selected fish species occurring off Washington.

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Point Totals / 59 / 68 / 66 / 61 / 66 / 67 / 51

Legend:
- Not Significant = 1
- Significant = 2
- Very Significant = 3

(Significance relates to species distribution along the contiguous U.S. West Coast)

1/ Commercially Important in Study Region.
2/ Anadromous Species. Presence in study area is limited to small out-migrating juveniles; larger, foraging juveniles; and near-mature fish returning to rivers to spawn.
3/ Recreationally Important in Study Region.
4/ Anadromous Species. Unlike salmon, steelhead adults are also present.
5/ A summary of point values (i.e., significance) associated with all species within an area.

Source: Strategic Assessment Branch (SAB) analysis of State of Washington commercial and recreational catch statistics in relation to species distribution maps present in the NOAA West Coast North America Coastal Zones Strategic Assessment: Data Atlas. Invertebrate and Fish Pre-publication Volume. NOAA SAB, Rockville MD.
Both the comparative significance analysis of species distributions (Table 5) and the analysis weighted by species abundance (Table 6) reveal that offshore and intermediate areas under sanctuary consideration (Areas 1, 2, 3, 5, and 6) generally are more significant for marine fishes than inshore areas (Areas 4 and 7).

Using commercial harvests as a means of assessing the significance of fish stocks within the proposed sanctuary region relative to other parts of the contiguous U.S. West Coast, the following is noted:

--About 15% of all West Coast groundfish harvests come from the sanctuary study region (based on 1987-1988 data); and
--Nearly 13% of all salmon harvests come from the region (1988-1990).

When looking at commercial harvests, offshore Areas 1 and 5 were the most important. More than two-thirds of annual 1987-88 study region harvests came from these areas for the following species:

--Pacific ocean perch
--Lingcod
--English sole
--Dover sole
--Pacific cod, and
--Sablefish.

Area 5, alone, produced the majority of harvests of widow rockfish.

Although non-coastal areas scored highest in the comparative significance analyses, the importance of coastal waters for marine fishes is underscored by the association of many species with estuarine habitats:

--Four of the top ten fishes commercially harvested along the outer coast of Washington are either estuarine-associated (i.e., they use estuaries during some time in their lives) or estuarine-dependent (i.e., they require estuaries to complete their life cycles). (Examples of estuarine associated/dependent species are chinook, coho, and chum salmon, and lingcod) (Table 2).
--The top four recreational species (chinook and coho salmon, steelhead, and lingcod) for Washington all utilize estuaries, at least as juveniles.

Note: Also see Tables 1. and 2. (Commercial landings and values...) in Section V, Socio-economic Coastal Characteristics.
Table 6. Comparative significance of study areas based on the relative abundance and importance of selected fish species occurring off Washington.

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Area (column) total: 379 371 358 296 371 388 298

Legend:
- **Density Index**: Defined as the relative density or abundance of the species, based on commercial and recreational harvests. Rated 1 - 10, with 1 = rare, and 10 = highly abundant.
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Source: Strategic Assessment Branch (SAB) analysis of the State of Washington commercial and recreational catch statistics in relation to species distribution maps in the NOAA West Coast of North America, Coastal and Ocean Zones Strategic Assessment: Data Atlas, Invertebrate and Fish Pre-publication Volume, NOAA, SAB, Rockville MD.
BIRDS
Coastal Areas 4 and 7 standout from other areas under consideration for sanctuary status when distributions of marine birds are examined (Table 7). Examples follow.

Lands adjacent to Area 7 (around Grays Harbor) contain one of only two major concentrations of adult bald eagles along the contiguous U.S. West Coast.

Only two major colonies of rhinoceros auklet (>20,000 birds) occur within the contiguous U.S.A. One occurs along the coast of Area 4 and the other is found in the adjacent Strait of Juan De Fuca.

Only two large colonies of tufted puffins (>1,000 birds) occur within the contiguous U.S. One is found along the coast of Area 4.

Grays Harbor and Willapa Bay in Area 7 are final staging areas for shorebird migrations during early spring.

The following relate to seabird colonies:

Seabird populations in Washington represent 12% of the contiguous U.S. West Coast total of 4.5 million birds (Table 8).

In toto, over 500,000 seabirds occur in nesting colonies within Washington. Nearly 70% of these occur along the outer coast; over 325,000 seabirds are found in Area 4 and about 45,500 are present in colonies in Area 7.

Nesting colonies along the outer coast of Washington (Figure 15) contain more than 50% of contiguous U.S. West Coast total populations for the following species:

---Fork-tailed storm-petrel
---Caspian tern
---Cassin's auklet
---Tufted puffin.
Table 7. Estimates of seabird populations in areas considered for the coastal Washington marine sanctuary.

<table>
<thead>
<tr>
<th>Species</th>
<th>Life Stage</th>
<th>Estimates for</th>
<th>Estimates by State</th>
<th>Total for Contiguous West Coast</th>
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<td></td>
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<td>Area 4</td>
<td>Area 7</td>
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<td>Fork-tailed Storm-petrel</td>
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<td>2,318</td>
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<td>Juveniles</td>
<td>1,934</td>
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<td>Adults</td>
<td>25,296</td>
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<td>Brown Pelican</td>
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<td>0</td>
<td>0</td>
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<td>Pelecanus occidentalis</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
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<td>916</td>
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<td>2,552</td>
<td>1,332</td>
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<td>96</td>
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<td>795</td>
<td>221</td>
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<tr>
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<td>5,515</td>
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<td>Caspian Tern</td>
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<td>69</td>
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<td>Tufted Puffin</td>
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<td>23,342</td>
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<tr>
<td>Fratercula cirrhata</td>
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<td>TOTAL - Adults</td>
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<td>192,934</td>
<td>17,467</td>
<td>263,352</td>
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<tr>
<td>TOTAL - Juveniles</td>
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<td>133,866</td>
<td>27,747</td>
<td>272,535</td>
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<td>TOTAL - Overall</td>
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<td>326,800</td>
<td>45,214</td>
<td>535,887</td>
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Sources:
Personal communications from R. Lowe for Oregon information.
Table 8. Comparative significance of study areas based on the distributions of selected marine bird species occurring off Washington.

<table>
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<tr>
<th>MARINE BIRDS</th>
<th>Area 1</th>
<th>Area 2</th>
<th>Area 3</th>
<th>Area 4</th>
<th>Area 5</th>
<th>Area 6</th>
<th>Area 7</th>
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<tr>
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<tr>
<td>Western &amp; Clark's Grebes</td>
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<td>Sooty Shearwater 1/2/</td>
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<td>Bald Eagle</td>
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<td>Western Gull</td>
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<td>Glaucous-winged Gull</td>
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<td>Black-Legged Kittiwake 1/2/</td>
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<td>Common &amp; Thick Billed Murres 4/</td>
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<td>Ancient Murrelet 2/</td>
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<tr>
<td>Cassin's Auklet</td>
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</tr>
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<td>Rhinocerous Auklet</td>
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<td>Tufted Puffin</td>
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<td>26</td>
<td>33</td>
<td>23</td>
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<td>36</td>
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</tbody>
</table>

- Not Significant = 1
- Significant = 2
- Very Significant = 3

(Significance relative to species distribution along the contiguous U.S. West Coast.)

Source: Strategic Assessment Branch (SAB). West Coast of North America Coastal and Ocean Zones Strategic Assessment: Data Atlas, Marine Birds Pre-publication Volume. NOAA, SAB, Rockville, MD.

**FOOTNOTES:**
1/ Pelagic seabird.
2/ Uses Region as a non-breeding, wintering area.
3/ Possible staging area for spring migrations.
4/ Mainly present during winter.
5/ A summary of point values (i.e., significance) associated with all species within an area.
Figure 15. Percentages of contiguous U.S. West Coast seabird populations present within coastal Washington areas under consideration for marine sanctuary status.

Sources:
Personal communications from R. Lowe for Oregon information.
MAMMALS
• A comparative significance analysis of marine mammal distributions (Table 8) suggests that offshore areas under consideration for marine sanctuary status (Areas 1, 2, and 5) are more important for marine mammal distributions than other areas.

• In general, most of the region under consideration for sanctuary status occurs within migration pathways for several species.

• A major adult summer area for the endangered fin whale occurs along the continental slope seaward of the study area.
Table 9. Comparative significance of study areas based on the distributions of selected marine mammal species occurring off Washington.

<table>
<thead>
<tr>
<th>MAMMALS</th>
<th>Area 1</th>
<th>Area 2</th>
<th>Area 3</th>
<th>Area 4</th>
<th>Area 5</th>
<th>Area 6</th>
<th>Area 7</th>
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<td>California Sea Lion</td>
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| Point Total | 55 | 55 | 38 | 35 | 55 | 40 | 32 |

○ Not Significant - 1  
● Significant - 2  
●● Very Significant - 3  

(Significance relative to species distribution along the contiguous U.S. West Coast)

Source: Strategic Assessment Branch (SAB). West Coast of North America Coastal and Ocean Zones Strategic Assessment: Data Atlas, Marine Mammals Pre-publication Volume. NOAA, SAB, Rockville, MD.

FOOTNOTES:
1/ Mainly found in waters shallower than 20 m.
2/ Concentration of juveniles less than 3 years old and some adults known to occur off the Washington coast.
3/ No rookeries and only one minor haulout area occurs in Washington waters.
4/ Only males are found in Washington waters.
5/ Area 7 contains too out of the eight major rookeries located along the U.S. West Coast.
6/ Year round. Adult concentrations occur in Areas 6 and 7.
7/ Endangered.
8/ Areas important during seasonal migrations in Nov.-June.
9/ Nearly extinct in north Pacific (~200 animals).
10/ Feeding and migration areas occur off Washington.
11/ A major adult area occurs on the continental slope seaward of the study region during April-Sept., additional individuals migrate through area in Sept.-Oct.
12/ A summary of point values (i.e. significance) associated with all species within an area.

Approx. 10,000 Harbor seals are found in Washington.
Table A.1—Land use by county and USGS Cataloging Unit in lands adjacent to waters considered for the proposed coastal Washington marine sanctuary.

<table>
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<th>Study Area</th>
<th>County</th>
<th>Land use (in square miles)</th>
<th>Totals</th>
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</tr>
<tr>
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<td>Jefferson</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>4 &amp; 7</td>
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<td>58</td>
</tr>
<tr>
<td>7</td>
<td>Pacific</td>
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<td>Total</td>
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</table>

<table>
<thead>
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<th>Study Area</th>
<th>Cataloging Unit</th>
<th>Land use (in square miles)</th>
<th>Totals</th>
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<tr>
<td></td>
<td></td>
<td>Urban</td>
<td>Agriculture</td>
</tr>
<tr>
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<td>4</td>
<td>17100102</td>
<td>6</td>
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</tr>
<tr>
<td>7</td>
<td>17100104 (1)</td>
<td>15</td>
<td>37</td>
</tr>
<tr>
<td>7</td>
<td>17100105</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>17100106</td>
<td>11</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>42</td>
<td>68</td>
</tr>
</tbody>
</table>

(1) Land use information for Cataloging Unit 17100103 is not available.

APPENDIX B
Appendix B. Freshwater Flow Information

Information on Freshwater Inputs into Areas Considered for the Proposed Coastal Washington Marine Sanctuary

Appendix Table B.1. lists the major rivers and streams in watersheds which drain into coastal portions of the sanctuary study region, along with the average long-term flow and the drainage area above the gage from which flow is measured. Of the 20 rivers and streams shown on Table B.1, the Chelhalis River, which discharges to Grays Harbor, has the largest flow. Compared to other major rivers on the West Coast, the rivers in this region are relatively small in terms of long term average flow. For example, the long-term flow of the Columbia River, measured at a point upstream of the confluence with the Willamette River, is about 40 times larger than that of the Chelhalis River (192,000 cubic feet per second (cfs) versus 5,100 cfs).

While relatively small in terms of flow, the rivers adjacent to the study region have high water yields - the volume of river flow generated per unit area of land - compared to other rivers on the West Coast. For example, the Quinault River ranks first in water yield of the 47 rivers inventoried by NOAA in 1990, with a yield of 10.77 cfs per square mile, while the Columbia River ranks 40th on the West Coast, with a yield of 0.8 cfs per square mile. Water yield is a function of many factors, including precipitation, land use and topography of the river's watershed. In this case, the high yields for rivers in the study area primarily reflects substantial precipitation in the region and the relatively steep topography associated with mountainous terrain.

Source: Personal communication with Steve Rohmann, NOAA Strategic Assessment Branch, Rockville, MD.
Table B.1—Information on freshwater flow of rivers in lands adjacent to areas under consideration for the proposed coastal Washington marine sanctuary.

<table>
<thead>
<tr>
<th>Study Area</th>
<th>River Name</th>
<th>Monitoring Station Location</th>
<th>Average daily flow (in cubic feet per second)</th>
<th>Drainage area at Gage (in square miles)</th>
<th>Ranking based on flow (1)</th>
<th>Yield (average flow/drainage area)</th>
<th>Ranking based on yield (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Queets River</td>
<td>near Clearwater</td>
<td>4,227</td>
<td>445</td>
<td>14</td>
<td>9.50</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Quinault River</td>
<td>at Quinault Lake</td>
<td>2,843</td>
<td>264</td>
<td>17</td>
<td>10.77</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Hoh River</td>
<td>at Highway 101 near Forks</td>
<td>2,521</td>
<td>253</td>
<td>18</td>
<td>9.96</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Soleduck River</td>
<td>near Quileute</td>
<td>1,465</td>
<td>219</td>
<td>24</td>
<td>6.69</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>Bogachiel River</td>
<td>near Forks</td>
<td>955</td>
<td>111</td>
<td>28</td>
<td>9.80</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Raft River</td>
<td>below Rainy Creek near Queets</td>
<td>543</td>
<td>76</td>
<td>32</td>
<td>7.14</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>Dickey River</td>
<td>near La Push</td>
<td>525</td>
<td>86</td>
<td>33</td>
<td>6.10</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td>Ozette River</td>
<td>at Ozette</td>
<td>337</td>
<td>78</td>
<td>35</td>
<td>4.32</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>Moclips River</td>
<td>at Moclips</td>
<td>200</td>
<td>35</td>
<td>38</td>
<td>5.71</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>Sooes River</td>
<td>below Miller Creek near Ozette</td>
<td>198</td>
<td>32</td>
<td>40</td>
<td>6.19</td>
<td>16</td>
</tr>
<tr>
<td>7</td>
<td>Chehalis River</td>
<td>near Satsop</td>
<td>5,109</td>
<td>1,761</td>
<td>11</td>
<td>2.90</td>
<td>31</td>
</tr>
<tr>
<td>7</td>
<td>Hump✦lip River</td>
<td>near Hump✦lip</td>
<td>1,335</td>
<td>130</td>
<td>25</td>
<td>10.27</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Wynoochee River</td>
<td>below Black Creek near Montesano</td>
<td>1,235</td>
<td>180</td>
<td>26</td>
<td>6.86</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>North River</td>
<td>near Raymond</td>
<td>960</td>
<td>219</td>
<td>27</td>
<td>4.40</td>
<td>23</td>
</tr>
<tr>
<td>7</td>
<td>Willapa River</td>
<td>near Willapa</td>
<td>626</td>
<td>130</td>
<td>29</td>
<td>4.93</td>
<td>21</td>
</tr>
<tr>
<td>7</td>
<td>Naselle River</td>
<td>near Naselle</td>
<td>425</td>
<td>55</td>
<td>34</td>
<td>7.73</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Smith Creek</td>
<td>near Richmond</td>
<td>237</td>
<td>56</td>
<td>36</td>
<td>4.09</td>
<td>36</td>
</tr>
<tr>
<td>7</td>
<td>S. Fk., Naselle River</td>
<td>near Naselle</td>
<td>129</td>
<td>16</td>
<td>43</td>
<td>7.17</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>North Nemah River</td>
<td>near South Bend</td>
<td>115</td>
<td>18</td>
<td>44</td>
<td>6.39</td>
<td>13</td>
</tr>
<tr>
<td>7</td>
<td>Salmon Creek</td>
<td>near Naselle</td>
<td>112</td>
<td>16</td>
<td>45</td>
<td>7.00</td>
<td>9</td>
</tr>
</tbody>
</table>

Total: 24,102

(1) Compares the average daily flow for 47 rivers discharging into the Pacific Ocean and Puget Sound. Included in the 47 rivers are the three with the largest average daily discharge: the Columbia River (182,734 cfs); the Willamette River (33,206 cfs); and the Sacramento River (25,217 cfs).

(2) Compares the yield for 47 rivers discharging into the Pacific Ocean and Puget Sound.

Source: Personal communication with Steve Rohmann. Strategic Assessment Branch, OMA/NOAA.
Appendix C. Pollution of Coastal Waters Information

Agricultural Pesticide Use in Lands Adjacent to Areas Considered for the Proposed Coastal Washington Marine Sanctuary

Lands adjacent to study Areas 4 and 7 contain relatively minor agricultural activity. The majority of these lands are forested (approximately 90%). The average agricultural acreage by county within these two study areas is only 3.6% (Appendix D Table D1.3.). The major crops (excluding pasture/range) are alfalfa, barley, corn, wheat and peas. According to NOAA's National Coastal Pollutant Discharge Inventory, which maintains a database of estimates on pesticide use for 28 common agricultural pesticides, the highest application by county for Areas 4 and 7 occurs in Grays Harbor County, with 6,836 pounds (base year 1982). In contrast, San Joaquin County, California is 98% agricultural area, with an estimated 658,000 pounds of the 28 agricultural pesticides applied. Typical of most pesticide application, herbicides make up the majority of amounts applied to lands adjacent to the proposed sanctuary region. Also, it should be noted that Clallam and Jefferson counties extend inland to Puget Sound; as a result, the total amount of agricultural pesticides applied in study Areas 4 and 7 is probably less than amounts estimated for those entire counties.

Additional Sources of Pesticides

Agricultural pesticide use in the Puget Sound and Columbia River Estuarine Drainage Areas (EDAs) is significantly higher than in drainage areas discharging to coastal waters of the proposed marine sanctuary. While it is possible that pesticides from the Columbia River and Puget Sound EDAs may affect the areas of the proposed sanctuary, it is unlikely because of travel times and amounts of dilution that occur in these systems.

Comparison of West Coast Pesticide Application Patterns by State

In comparison to the rest of the West Coast, Washington ranks second to California in agricultural pesticide application to coastal areas. More than three times as much pesticide was applied in coastal areas of California than in Washington. It should be noted, however, that California has significantly more coastal land area than Oregon and Washington combined.

Source: National Coastal Pollutant Discharge Inventory Program Data Base on Pesticide Use in Coastal Areas of the United States
Appendix Table C.1. Summary of pollutant discharges into counties adjacent to the proposed Washington marine sanctuary, by USGS Cataloging Unit and source category (circa 1984).

**Flow (millions of gallons per year)**

<table>
<thead>
<tr>
<th>USGS Cataloging Unit</th>
<th>Point Sources</th>
<th>Nonpoint Sources</th>
<th>All Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wastewater</td>
<td>Direct Industrial</td>
<td>Urban</td>
</tr>
<tr>
<td></td>
<td>Treatment Plants</td>
<td>Dischargers</td>
<td>Runoff</td>
</tr>
<tr>
<td>17100101</td>
<td>4</td>
<td>40</td>
<td>7,630</td>
</tr>
<tr>
<td>17100102</td>
<td>4</td>
<td>97</td>
<td>4,232</td>
</tr>
<tr>
<td>17100103</td>
<td>7</td>
<td>8</td>
<td>11,800</td>
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<tr>
<td>17100104</td>
<td>7</td>
<td>417</td>
<td>27,480</td>
</tr>
<tr>
<td>17100105</td>
<td>7</td>
<td>2,403</td>
<td>17,530</td>
</tr>
<tr>
<td>17100106</td>
<td>7</td>
<td>636</td>
<td>6,033</td>
</tr>
</tbody>
</table>

Study Region Total: 3,602 74,705 19,794 24,962 2,158,120 28,600 824,000 3,133,781
West Coast Total: 971,400 702,000 862,500 750,200 8,858,000 1,352,000 94,850,000 112,500,000
% of West Coast: 0.4 10.6 2.3 3.3 24.4 2.1 0.9 2.8

**BOD - Biochemical Oxygen Demand (tons per year)**

<table>
<thead>
<tr>
<th>USGS Cataloging Unit</th>
<th>Point Sources</th>
<th>Nonpoint Sources</th>
<th>All Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wastewater</td>
<td>Direct Industrial</td>
<td>Urban</td>
</tr>
<tr>
<td></td>
<td>Treatment Plants</td>
<td>Dischargers</td>
<td>Runoff</td>
</tr>
<tr>
<td>17100101</td>
<td>4</td>
<td>5.1</td>
<td>153.0</td>
</tr>
<tr>
<td>17100102</td>
<td>4</td>
<td>12.9</td>
<td>84.8</td>
</tr>
<tr>
<td>17100103</td>
<td>7</td>
<td>1.1</td>
<td>1,648.0</td>
</tr>
<tr>
<td>17100104</td>
<td>7</td>
<td>63.5</td>
<td>4,068.2</td>
</tr>
<tr>
<td>17100105</td>
<td>7</td>
<td>89.8</td>
<td>2,384.0</td>
</tr>
<tr>
<td>17100106</td>
<td>7</td>
<td>114.0</td>
<td>482.3</td>
</tr>
</tbody>
</table>

Study Region Total: 286.3 8,820.3 1,137.6 379.1 28,101.5 48.8 5,160.0 43,933.7
West Coast Total: 339,670.0 54,580.0 46,748.0 58,652.0 232,630.0 163,840.0 620,180.0 1,516,300.0
% of West Coast: 0.1 16.2 2.4 0.6 12.1 0.0 0.8 2.9

Source: Strategic Assessment Branch, NOAA, 1984: The National Coastal Pollutant Discharge Inventory, Rockville, MD
### Appendix Table C.1. Summary of pollutant discharges into counties adjacent to the proposed Washington marine sanctuary, by USGS Cataloging Unit and source category (circa 1984).

#### TSS - Total Suspended Solids (tons per year)

<table>
<thead>
<tr>
<th>USGS Cataloging Unit</th>
<th>Study Area</th>
<th>Wastewater Dischargers</th>
<th>Direct Industrial Dischargers</th>
<th>Urban Runoff</th>
<th>Cropland Runoff</th>
<th>Forestland Runoff</th>
<th>Pasture/Range</th>
<th>Upstream Sources</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>17100101</td>
<td>4</td>
<td>5.1</td>
<td>191.0</td>
<td>426.0</td>
<td>0.0</td>
<td>474,010.0</td>
<td>314.7</td>
<td>0.0</td>
<td>474,950.0</td>
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<tr>
<td>17100102</td>
<td>4</td>
<td>18.6</td>
<td>106.2</td>
<td>0.0</td>
<td>0.0</td>
<td>787,520.0</td>
<td>108.0</td>
<td>0.0</td>
<td>787,750.0</td>
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<tr>
<td>17100103</td>
<td>7</td>
<td>1.1</td>
<td>951.0</td>
<td>136.0</td>
<td>4,690.7</td>
<td>5,634.0</td>
<td>237.8</td>
<td>20,600.0</td>
<td>32,253.0</td>
</tr>
<tr>
<td>17100104</td>
<td>7</td>
<td>88.3</td>
<td>4,398.3</td>
<td>8,840.0</td>
<td>1,435.1</td>
<td>209,640.0</td>
<td>615.9</td>
<td>0.0</td>
<td>225,020.0</td>
</tr>
<tr>
<td>17100105</td>
<td>7</td>
<td>66.8</td>
<td>5,782.4</td>
<td>5,744.0</td>
<td>20.8</td>
<td>141,010.0</td>
<td>60.6</td>
<td>0.0</td>
<td>152,680.0</td>
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<tr>
<td>17100106</td>
<td>7</td>
<td>174.0</td>
<td>362.2</td>
<td>755.0</td>
<td>11,716.0</td>
<td>282,110.0</td>
<td>1,434.3</td>
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<td>296,550.0</td>
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</tbody>
</table>

**Study Region Total:** 353.8 11,791.1 17,862.5 1,899,924.0 2,771.4 20,600.0 1,969,205.9

**West Coast Total:** 224,090.0 77,892.0 9,737,500 35,900,000 30,833,000 101,000,000

**% of West Coast:** 0.2 15.1 2.4 0.2 8.1 0.0 0.1 1.9

#### TN - Total Nitrogen (tons per year)

<table>
<thead>
<tr>
<th>USGS Cataloging Unit</th>
<th>Study Area</th>
<th>Wastewater Dischargers</th>
<th>Direct Industrial Dischargers</th>
<th>Urban Runoff</th>
<th>Cropland Runoff</th>
<th>Forestland Runoff</th>
<th>Pasture/Range</th>
<th>Upstream Sources</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>17100101</td>
<td>4</td>
<td>1.9</td>
<td>22.3</td>
<td>6.5</td>
<td>0.0</td>
<td>4,023.5</td>
<td>4.7</td>
<td>0.0</td>
<td>4,058.9</td>
</tr>
<tr>
<td>17100102</td>
<td>4</td>
<td>4.6</td>
<td>12.4</td>
<td>0.0</td>
<td>0.0</td>
<td>2,075.8</td>
<td>0.4</td>
<td>0.0</td>
<td>2,093.2</td>
</tr>
<tr>
<td>17100103</td>
<td>7</td>
<td>0.5</td>
<td>116.7</td>
<td>2.1</td>
<td>73.1</td>
<td>58.2</td>
<td>2.4</td>
<td>0.0</td>
<td>3,143.0</td>
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<td>17100104</td>
<td>7</td>
<td>22.9</td>
<td>104.2</td>
<td>136.0</td>
<td>29.1</td>
<td>2,593.6</td>
<td>5.6</td>
<td>0.0</td>
<td>2,891.4</td>
</tr>
<tr>
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<td>7</td>
<td>113.5</td>
<td>65.5</td>
<td>89.1</td>
<td>3.6</td>
<td>1,763.1</td>
<td>0.6</td>
<td>0.0</td>
<td>2,035.4</td>
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<tr>
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<td>37.1</td>
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<td>139.6</td>
<td>3,524.0</td>
<td>10.8</td>
<td>0.0</td>
<td>3,754.5</td>
</tr>
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</table>

**Study Region Total:** 180.4 352.5 245.4 245.4 14,038.3 24.4 2,890.0 17,976.3

**West Coast Total:** 55,648.0 3,605.1 10,167.0 39,110.0 116,300.0 81,931.0 330,520.0 644,520.0

**% of West Coast:** 0.3 9.8 2.4 0.6 12.1 0.0 0.9 2.8

Source: Strategic Assessment Branch, NOAA, 1984: The National Coastal Pollutant Discharge Inventory, Rockville, MD
Appendix Table C.1. Summary of pollutant discharges into counties adjacent to the proposed Washington marine sanctuary, by USGS Cataloging Unit and source category (circa 1984).

### TP - Total Phosphorus (tons per year)

<table>
<thead>
<tr>
<th>USGS Cataloging Unit</th>
<th>Study Area</th>
<th>Wastewater Treatment Plants</th>
<th>Direct Industrial Dischargers</th>
<th>Urban Runoff</th>
<th>Cropland Runoff</th>
<th>Forestland Runoff</th>
<th>Pasture/Range</th>
<th>Upstream Sources</th>
<th>All Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>17100101</td>
<td>4</td>
<td>1.3</td>
<td>3.2</td>
<td>1.0</td>
<td>0.0</td>
<td>40.2</td>
<td>0.0</td>
<td>0.0</td>
<td>45.8</td>
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<tr>
<td>17100102</td>
<td>4</td>
<td>2.8</td>
<td>1.8</td>
<td>0.0</td>
<td>0.0</td>
<td>20.8</td>
<td>0.0</td>
<td>0.0</td>
<td>25.4</td>
</tr>
<tr>
<td>17100103</td>
<td>7</td>
<td>0.4</td>
<td>4.5</td>
<td>0.3</td>
<td>2.3</td>
<td>0.6</td>
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<td>129.0</td>
<td>137.2</td>
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<td>8.0</td>
<td>20.6</td>
<td>1.2</td>
<td>25.9</td>
<td>0.1</td>
<td>0.0</td>
<td>73.1</td>
</tr>
<tr>
<td>17100105</td>
<td>7</td>
<td>71.4</td>
<td>3.2</td>
<td>14.4</td>
<td>0.2</td>
<td>17.6</td>
<td>0.0</td>
<td>0.0</td>
<td>106.6</td>
</tr>
<tr>
<td>17100106</td>
<td>7</td>
<td>30.0</td>
<td>2.7</td>
<td>1.8</td>
<td>2.1</td>
<td>35.2</td>
<td>0.1</td>
<td>0.0</td>
<td>71.9</td>
</tr>
</tbody>
</table>

**Study Region Total:** 123.2 23.4 38.0 5.9 140.4 0.2 129.0 460.1

**West Coast Total:** 39,844.0 312.9 1,576.7 1,029.6 1,163.0 819.3 30,738.0 75,574.0

**% of West Coast:** 0.3 7.5 2.4 0.6 12.1 0.0 3.4 0.6

### As - Arsenic (tons per year)

<table>
<thead>
<tr>
<th>USGS Cataloging Unit</th>
<th>Study Area</th>
<th>Wastewater Treatment Plants</th>
<th>Direct Industrial Dischargers</th>
<th>Urban Runoff</th>
<th>Cropland Runoff</th>
<th>Forestland Runoff</th>
<th>Pasture/Range</th>
<th>Upstream Sources</th>
<th>All Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>17100101</td>
<td>4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>3.1</td>
<td>0.0</td>
<td>0.0</td>
<td>3.1</td>
</tr>
<tr>
<td>17100102</td>
<td>4</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>5.1</td>
<td>0.0</td>
<td>0.0</td>
<td>5.1</td>
</tr>
<tr>
<td>17100103</td>
<td>7</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>3.4</td>
<td>3.5</td>
</tr>
<tr>
<td>17100104</td>
<td>7</td>
<td>0.1</td>
<td>0.0</td>
<td>0.3</td>
<td>0.0</td>
<td>1.4</td>
<td>0.0</td>
<td>0.0</td>
<td>1.8</td>
</tr>
<tr>
<td>17100105</td>
<td>7</td>
<td>0.3</td>
<td>0.0</td>
<td>0.2</td>
<td>0.0</td>
<td>0.9</td>
<td>0.0</td>
<td>0.0</td>
<td>1.5</td>
</tr>
<tr>
<td>17100106</td>
<td>7</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.1</td>
<td>1.8</td>
<td>0.0</td>
<td>0.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

**Study Region Total:** 0.5 0.0 0.6 0.1 12.4 0.0 3.4 17.0

**West Coast Total:** 91.7 24.1 24.2 77.7 114.5 221.8 630.7 1,184.6

**% of West Coast:** 0.5 0.1 2.4 0.1 10.8 0.0 0.5 1.4

Source: Strategic Assessment Branch, NOAA, 1984: The National Coastal Pollutant Discharge Inventory, Rockville, MD
Appendix Table C.1. Summary of pollutant discharges into counties adjacent to the proposed Washington marine sanctuary, by USGS Cataloging Unit and source category (circa 1984).

### Cd - Cadmium (tons per year)

<table>
<thead>
<tr>
<th>USGS Cataloging Unit</th>
<th>Study Area</th>
<th>Wastewater Treatment Plants</th>
<th>Direct Industrial Dischargers</th>
<th>Point Sources</th>
<th>Nonpoint Sources</th>
<th>All Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Urban Runoff</td>
<td>Cropland Runoff</td>
<td>Forestland Runoff</td>
</tr>
<tr>
<td>17100101</td>
<td>4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.2</td>
</tr>
<tr>
<td>17100102</td>
<td>4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.3</td>
</tr>
<tr>
<td>17100103</td>
<td>7</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>17100104</td>
<td>7</td>
<td>0.1</td>
<td>0.0</td>
<td>0.1</td>
<td>0.0</td>
<td>0.1</td>
</tr>
<tr>
<td>17100105</td>
<td>7</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.0</td>
<td>0.1</td>
</tr>
<tr>
<td>17100106</td>
<td>7</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Study Region Total: 0.3 0.2 0.1 0.2 0.3 0.8 0.0 3.4 4.8

West Coast Total: 72.9 8.2 7.3 3.9 9.4 14.3 431.7 547.7

% of West Coast: 0.4 0.1 0.2 0.3 0.5 0.8 0.0 0.2

### Cr - Chromium (tons per year)

<table>
<thead>
<tr>
<th>USGS Cataloging Unit</th>
<th>Study Area</th>
<th>Wastewater Treatment Plants</th>
<th>Direct Industrial Dischargers</th>
<th>Point Sources</th>
<th>Nonpoint Sources</th>
<th>All Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Urban Runoff</td>
<td>Cropland Runoff</td>
<td>Forestland Runoff</td>
</tr>
<tr>
<td>17100101</td>
<td>4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>47.4</td>
</tr>
<tr>
<td>17100102</td>
<td>4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>78.8</td>
</tr>
<tr>
<td>17100103</td>
<td>7</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.6</td>
</tr>
<tr>
<td>17100104</td>
<td>7</td>
<td>0.1</td>
<td>1.0</td>
<td>0.5</td>
<td>0.1</td>
<td>21.0</td>
</tr>
<tr>
<td>17100105</td>
<td>7</td>
<td>0.4</td>
<td>1.5</td>
<td>0.5</td>
<td>0.0</td>
<td>14.1</td>
</tr>
<tr>
<td>17100106</td>
<td>7</td>
<td>0.2</td>
<td>0.0</td>
<td>0.0</td>
<td>1.2</td>
<td>28.2</td>
</tr>
</tbody>
</table>

Study Region Total: 0.8 2.6 1.1 1.8 190.0 0.3 34.4 230.8

West Coast Total: 240.8 74.5 42.5 814.5 2,166.4 3,017.2 4,195.5 10,551.3

% of West Coast: 0.3 3.4 2.5 0.2 8.8 0.0 0.8 2.2

Source: Strategic Assessment Branch, NOAA, 1984: The National Coastal Pollutant Discharge Inventory, Rockville, MD
# Appendix Table C.1
Summary of pollutant discharges into counties adjacent to the proposed Washington marine sanctuary, by USGS Cataloging Unit and source category (circa 1984).

## Pb - Lead (tons per year)

<table>
<thead>
<tr>
<th>USGS Cataloging Unit</th>
<th>Study Area</th>
<th>Wastewater Treatment Plants</th>
<th>Direct Industrial Dischargers</th>
<th>Urban Runoff</th>
<th>Cropland Runoff</th>
<th>Forestland Runoff</th>
<th>Pasture/Range</th>
<th>Upstream Sources</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>17100101</td>
<td>4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.4</td>
<td>0.0</td>
<td>11.4</td>
<td>0.0</td>
<td>0.0</td>
<td>11.8</td>
</tr>
<tr>
<td>17100102</td>
<td>4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>15.7</td>
<td>0.0</td>
<td>0.0</td>
<td>15.7</td>
</tr>
<tr>
<td>17100103</td>
<td>7</td>
<td>0.0</td>
<td>0.0</td>
<td>0.2</td>
<td>0.1</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>17.4</td>
</tr>
<tr>
<td>17100104</td>
<td>7</td>
<td>0.1</td>
<td>0.3</td>
<td>8.9</td>
<td>0.0</td>
<td>4.2</td>
<td>0.0</td>
<td>0.0</td>
<td>13.6</td>
</tr>
<tr>
<td>17100105</td>
<td>7</td>
<td>0.5</td>
<td>1.1</td>
<td>6.3</td>
<td>0.0</td>
<td>2.8</td>
<td>0.0</td>
<td>0.0</td>
<td>10.6</td>
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<tr>
<td>17100106</td>
<td>7</td>
<td>0.1</td>
<td>0.0</td>
<td>0.6</td>
<td>0.2</td>
<td>5.6</td>
<td>0.0</td>
<td>0.0</td>
<td>6.8</td>
</tr>
</tbody>
</table>

**Study Region Total:** 0.7 1.4 16.6 0.4 39.8 0.1 17.4

**West Coast Total:** 171.5 55.7 684.4 204.0 411.4 824.6 1,013.2

**% of West Coast:** 0.4 2.5 2.4 0.2 9.7 0.0 1.7

## Hg - Mercury (pounds per year)

<table>
<thead>
<tr>
<th>USGS Cataloging Unit</th>
<th>Study Area</th>
<th>Wastewater Treatment Plants</th>
<th>Direct Industrial Dischargers</th>
<th>Urban Runoff</th>
<th>Cropland Runoff</th>
<th>Forestland Runoff</th>
<th>Pasture/Range</th>
<th>Upstream Sources</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>17100101</td>
<td>4</td>
<td>0.1</td>
<td>0.0</td>
<td>0.5</td>
<td>0.0</td>
<td>132.6</td>
<td>0.1</td>
<td>0.0</td>
<td>133.3</td>
</tr>
<tr>
<td>17100102</td>
<td>4</td>
<td>0.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>165.7</td>
<td>0.0</td>
<td>0.0</td>
<td>165.7</td>
</tr>
<tr>
<td>17100103</td>
<td>7</td>
<td>0.0</td>
<td>0.0</td>
<td>0.2</td>
<td>1.0</td>
<td>1.9</td>
<td>0.1</td>
<td>0.0</td>
<td>725.0</td>
</tr>
<tr>
<td>17100104</td>
<td>7</td>
<td>1.7</td>
<td>6.9</td>
<td>9.8</td>
<td>0.6</td>
<td>82.0</td>
<td>0.2</td>
<td>0.0</td>
<td>101.2</td>
</tr>
<tr>
<td>17100105</td>
<td>7</td>
<td>7.6</td>
<td>15.8</td>
<td>9.2</td>
<td>0.0</td>
<td>56.3</td>
<td>0.0</td>
<td>0.0</td>
<td>89.0</td>
</tr>
<tr>
<td>17100106</td>
<td>7</td>
<td>2.8</td>
<td>0.1</td>
<td>0.8</td>
<td>4.7</td>
<td>112.5</td>
<td>0.6</td>
<td>0.0</td>
<td>121.5</td>
</tr>
</tbody>
</table>

**Study Region Total:** 12.5 22.8 20.6 6.2 551.1 1.0 725.0

**West Coast Total:** 4,535.3 912.4 835.5 2,399.0 4,377.2 8,271.1 227,851.4

**% of West Coast:** 0.3 2.5 2.5 0.3 12.6 0.0 0.3

Source: Strategic Assessment Branch, NOAA, 1984: The National Coastal Pollutant Discharge Inventory, Rockville, MD
Appendix Table C.1. Summary of pollutant discharges into counties adjacent to the proposed Washington marine sanctuary, by USGS Cataloging Unit and source category (circa 1984).

### Oil and Grease (tons per year)

<table>
<thead>
<tr>
<th>USGS Cataloging Unit</th>
<th>Study Area</th>
<th>Wastewater Treatment Plants</th>
<th>Direct Industrial Dischargers</th>
<th>Urban Runoff</th>
<th>Cropland Runoff</th>
<th>Forestland Runoff</th>
<th>Pasture/Rangeland Runoff</th>
<th>Upstream Sources</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>17100101</td>
<td>4</td>
<td>2.6</td>
<td>0.0</td>
<td>16.9</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>19.5</td>
</tr>
<tr>
<td>17100102</td>
<td>4</td>
<td>4.6</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>4.6</td>
</tr>
<tr>
<td>17100103</td>
<td>7</td>
<td>1.0</td>
<td>0.0</td>
<td>5.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>6.1</td>
</tr>
<tr>
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<td>7</td>
<td>33.6</td>
<td>2.4</td>
<td>191.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>227.0</td>
</tr>
<tr>
<td>17100105</td>
<td>7</td>
<td>116.5</td>
<td>0.6</td>
<td>159.4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>276.4</td>
</tr>
<tr>
<td>17100106</td>
<td>7</td>
<td>60.9</td>
<td>0.7</td>
<td>15.4</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>77.0</td>
</tr>
<tr>
<td>Study Region Total</td>
<td></td>
<td>219.1</td>
<td>3.6</td>
<td>387.9</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>610.6</td>
</tr>
<tr>
<td>West Coast Total</td>
<td></td>
<td>62,561.5</td>
<td>1,652.2</td>
<td>29,581.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>93,795.1</td>
</tr>
<tr>
<td>% of West Coast</td>
<td></td>
<td>0.4</td>
<td>0.2</td>
<td>1.3</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Source: Strategic Assessment Branch, NOAA, 1984: The National Coastal Pollutant Discharge Inventory, Rockville, MD
Appendix Table C.2--Major point source dischargers into counties adjacent to areas under consideration for the proposed coastal Washington marine sanctuary (circa 1984).

<table>
<thead>
<tr>
<th>Study Area</th>
<th>USGS Cataloging Unit</th>
<th>NPDES Area Code</th>
<th>Facility Name</th>
<th>SIC Code</th>
<th>Activity</th>
<th>Flow - in millions of gallons/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>17100103</td>
<td>WA0039144</td>
<td>Domsea Farms</td>
<td>2091</td>
<td>Canned and cured seafoods</td>
<td>900.0</td>
</tr>
<tr>
<td>7</td>
<td>17100104</td>
<td>WA0000809</td>
<td>Weyerhaeuser Co., Cosmopolis</td>
<td>2611</td>
<td>Pulp mills</td>
<td>8,220.0</td>
</tr>
<tr>
<td>7</td>
<td>17100105</td>
<td>WA0003077</td>
<td>ITT Rayonier Inc., Hoquiam</td>
<td>2611</td>
<td>Pulp mills</td>
<td>9,760.0</td>
</tr>
<tr>
<td>7</td>
<td>17100105</td>
<td>WA0037192</td>
<td>Aberdeen Sewage Treatment Plant</td>
<td>4952</td>
<td>Sewerage systems</td>
<td>1,680.0</td>
</tr>
<tr>
<td>7</td>
<td>17100105</td>
<td>WA0020915</td>
<td>Hoquiam Sewage Treatment Plant</td>
<td>4952</td>
<td>Sewerage systems</td>
<td>617.0</td>
</tr>
<tr>
<td>7</td>
<td>17100106</td>
<td>WA0024846</td>
<td>Peterson and Sons Seafood, Inc.</td>
<td>2091</td>
<td>Canned and cured seafoods</td>
<td>110.0</td>
</tr>
<tr>
<td>7</td>
<td>17100106</td>
<td>WA0001988</td>
<td>Harbor Bell, Inc.</td>
<td>2092</td>
<td>Fresh and frozen packaged fish</td>
<td>43.6</td>
</tr>
</tbody>
</table>

Total: 21,330.6

Notes: NPDES-- National Pollutant Discharge Elimination System; SIC - Standard Industrial Classification

Source: Strategic Assessment Branch, NOAA, 1984: The National Coastal Pollutant Discharge Inventory, Rockville, MD
Appendix C.3--Description of pollutant outputs by major point sources discharging into counties adjacent to areas under consideration for the proposed coastal Washington marine sanctuary (circa 1984).

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>BOD tons/year</th>
<th>TSS tons/year</th>
<th>TN tons/year</th>
<th>TP tons/year</th>
<th>Arsenic tons/year</th>
<th>Chromium tons/year</th>
<th>Lead tons/year</th>
<th>Mercury Oil &amp; Grease pounds/year</th>
<th>Mercury Oil &amp; Grease tons/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domsea Farms</td>
<td>1,430</td>
<td>679</td>
<td>85</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Weyerhaeuser Co., Cosmopolis</td>
<td>3,680</td>
<td>3,910</td>
<td>48</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.03</td>
<td>0.343</td>
<td>6.86</td>
</tr>
<tr>
<td>ITT Rayonier Inc., Hoquiam</td>
<td>2,140</td>
<td>5,520</td>
<td>39</td>
<td>0</td>
<td>0.0257</td>
<td>0.128</td>
<td>1.48</td>
<td>1.05</td>
<td>15.8</td>
</tr>
<tr>
<td>Aberdeen Sewage Treatment Plant</td>
<td>60</td>
<td>30</td>
<td>79</td>
<td>49</td>
<td>0.226</td>
<td>0.0792</td>
<td>0.301</td>
<td>0.313</td>
<td>5.23</td>
</tr>
<tr>
<td>Hoquiam Sewage Treatment Plant</td>
<td>11</td>
<td>15</td>
<td>29</td>
<td>18</td>
<td>0.0831</td>
<td>0.0291</td>
<td>0.11</td>
<td>0.115</td>
<td>1.92</td>
</tr>
<tr>
<td>Peterson and Sons Seafood, Inc.</td>
<td>255</td>
<td>155</td>
<td>9</td>
<td>0</td>
<td>0.000157</td>
<td>0.000784</td>
<td>0.00392</td>
<td>0.0047</td>
<td>0.0627</td>
</tr>
<tr>
<td>Harbor Bell, Inc.</td>
<td>76</td>
<td>39</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>7,651</strong></td>
<td><strong>10,348</strong></td>
<td><strong>292</strong></td>
<td><strong>67</strong></td>
<td><strong>0</strong></td>
<td><strong>0</strong></td>
<td><strong>3</strong></td>
<td><strong>2</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

Notes: BOD - Biochemical Oxygen Demand; TSS - Total Suspended Solids; TN - Total Nitrogen; TP - Total Phosphorus
Source: Strategic Assessment Branch, NOAA, 1984: The National Coastal Pollutant Discharge Inventory, Rockville, MD
Appendix Table C.4—Number of direct discharging point sources within counties adjacent to areas under consideration for the proposed coastal Washington marine sanctuary, by USGS Cataloging Unit and source category (circa 1984).

<table>
<thead>
<tr>
<th>USGS Cataloging Unit</th>
<th>Study Area</th>
<th>Industrial</th>
<th>Waste Water Treatment Plants</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Major</td>
<td>Minor</td>
<td>Total</td>
</tr>
<tr>
<td>17100101</td>
<td>4</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>17100102</td>
<td>4</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>17100103</td>
<td>7</td>
<td>1</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>17100104</td>
<td>7</td>
<td>1</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>17100105</td>
<td>7</td>
<td>1</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>17100106</td>
<td>7</td>
<td>2</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>Totals</td>
<td>5</td>
<td>51</td>
<td>56</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: The qualifiers "Major" and "Minor" are from EPA's classification for discharging facilities.
APPENDIX D
Table D.1.--Socio-economic information for coastal counties associated with the proposed coastal Washington marine sanctuary and other coastal regions of the USA: Demographics.

<table>
<thead>
<tr>
<th>Region</th>
<th>Population by age group (1980)</th>
<th>Total population by year</th>
<th>Population Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer Washington Coast</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clallam County</td>
<td>4,009</td>
<td>9,857</td>
<td>13,966</td>
</tr>
<tr>
<td>Grays Harbor County</td>
<td>5,252</td>
<td>13,716</td>
<td>18,968</td>
</tr>
<tr>
<td>Jefferson County</td>
<td>1,071</td>
<td>2,907</td>
<td>3,978</td>
</tr>
<tr>
<td>Pacific County</td>
<td>1,188</td>
<td>3,221</td>
<td>4,409</td>
</tr>
<tr>
<td>Counties combined</td>
<td>11,520</td>
<td>29,801</td>
<td>41,321</td>
</tr>
<tr>
<td>County average</td>
<td>2,880</td>
<td>7,450</td>
<td>10,330</td>
</tr>
<tr>
<td>State of Washington</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal counties combined</td>
<td>306,123</td>
<td>833,237</td>
<td>1,132,360</td>
</tr>
<tr>
<td>County average</td>
<td>7,849</td>
<td>21,265</td>
<td>29,214</td>
</tr>
<tr>
<td>West Coast (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal counties combined</td>
<td>1,681,325</td>
<td>4,639,265</td>
<td>6,320,720</td>
</tr>
<tr>
<td>County average</td>
<td>32,333</td>
<td>80,210</td>
<td>121,552</td>
</tr>
<tr>
<td>Total Coastal USA (2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal counties combined</td>
<td>6,919,388</td>
<td>20,505,029</td>
<td>27,424,418</td>
</tr>
<tr>
<td>County average</td>
<td>15,342</td>
<td>45,466</td>
<td>60,808</td>
</tr>
</tbody>
</table>

(1) Washington, Oregon, and California.
(2) Includes Alaska, Hawaii, and the Great Lakes region.

Table D.2—Socio-economic information for coastal counties associated with the proposed coastal Washington marine sanctuary and other coastal regions of the USA: Single unit housing construction permits and levels of occupancy.

<table>
<thead>
<tr>
<th>Region</th>
<th>Numbers of Construction Permits for Single Housing Units by Year</th>
<th>Total Housing Units</th>
<th>Total Units Occupied</th>
<th>Total Year-round Detached Housing (3)</th>
<th>Aggregate Value in Dollars (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outer Washington Coast</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clallam County</td>
<td>178</td>
<td>230</td>
<td>195</td>
<td>283</td>
<td>414</td>
</tr>
<tr>
<td>Grays Harbor County</td>
<td>100</td>
<td>95</td>
<td>90</td>
<td>108</td>
<td>118</td>
</tr>
<tr>
<td>Jefferson County</td>
<td>128</td>
<td>125</td>
<td>127</td>
<td>137</td>
<td>255</td>
</tr>
<tr>
<td>Pacific County</td>
<td>48</td>
<td>58</td>
<td>50</td>
<td>46</td>
<td>56</td>
</tr>
<tr>
<td>Counties combined</td>
<td>454</td>
<td>508</td>
<td>462</td>
<td>574</td>
<td>843</td>
</tr>
<tr>
<td>County average</td>
<td>114</td>
<td>127</td>
<td>116</td>
<td>144</td>
<td>211</td>
</tr>
<tr>
<td>State of Washington</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal counties combined</td>
<td>17,041</td>
<td>19,262</td>
<td>19,962</td>
<td>21,484</td>
<td>26,420</td>
</tr>
<tr>
<td>County average</td>
<td>437</td>
<td>494</td>
<td>512</td>
<td>551</td>
<td>677</td>
</tr>
<tr>
<td>West Coast (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal counties combined</td>
<td>91,908</td>
<td>107,543</td>
<td>103,088</td>
<td>114,925</td>
<td>121,473</td>
</tr>
<tr>
<td>County average</td>
<td>1,767</td>
<td>2,068</td>
<td>1,982</td>
<td>2,210</td>
<td>2,336</td>
</tr>
<tr>
<td>Total Coastal USA (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal counties combined</td>
<td>430,956</td>
<td>479,222</td>
<td>465,496</td>
<td>448,062</td>
<td>420,071</td>
</tr>
<tr>
<td>County average</td>
<td>956</td>
<td>1,063</td>
<td>1,032</td>
<td>993</td>
<td>931</td>
</tr>
</tbody>
</table>

(1) Washington, Oregon, and California.
(2) Includes Alaska, Hawaii, and the Great Lakes region.
(3) Total year-round, detached, single family housing units (includes owner-occupied and rentals).
(4) Aggregation for all non-condominium dwellings (owner-occupied only). Value should be multiplied by 250.

Table D.3—Socio-economic information for coastal counties associated with the proposed coastal Washington marine sanctuary and other coastal regions of the USA: Employment and farming information.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Manufacturing</td>
<td>Retail</td>
<td>FIRE (3)</td>
<td>Service</td>
</tr>
<tr>
<td>Outer Washington Coast</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clallam County</td>
<td>2,785</td>
<td>3,010</td>
<td>454</td>
<td>2,292</td>
</tr>
<tr>
<td>Grays Harbor County</td>
<td>5,782</td>
<td>3,735</td>
<td>568</td>
<td>3,305</td>
</tr>
<tr>
<td>Jefferson County</td>
<td>644</td>
<td>943</td>
<td>117</td>
<td>700</td>
</tr>
<tr>
<td>Pacific County</td>
<td>989</td>
<td>827</td>
<td>155</td>
<td>772</td>
</tr>
<tr>
<td>Counties combined</td>
<td>10,200</td>
<td>8,515</td>
<td>1,324</td>
<td>7,069</td>
</tr>
<tr>
<td>County average</td>
<td>2,550</td>
<td>2,129</td>
<td>331</td>
<td>1,767</td>
</tr>
<tr>
<td>State of Washington</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal counties combined</td>
<td>290,329</td>
<td>300,816</td>
<td>100,123</td>
<td>361,519</td>
</tr>
<tr>
<td>County average</td>
<td>7,188</td>
<td>7,713</td>
<td>2,567</td>
<td>9,270</td>
</tr>
<tr>
<td>West Coast (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal counties combined</td>
<td>2,265,532</td>
<td>1,945,214</td>
<td>807,037</td>
<td>2,737,134</td>
</tr>
<tr>
<td>County average</td>
<td>43,568</td>
<td>37,408</td>
<td>15,520</td>
<td>52,637</td>
</tr>
<tr>
<td>Total Coastal USA (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>County average</td>
<td>18,735</td>
<td>17,337</td>
<td>7,206</td>
<td>25,028</td>
</tr>
</tbody>
</table>

(1) Washington, Oregon, and California.
(2) Includes Alaska, Hawaii, and the Great Lakes region.
(3) Finance, Insurance, and Real Estate.

APPENDIX E
Appendix E. Living Marine Resources Information

Methodology for the Comparative Significance of Study Areas analyses

The relative importance of the seven analysis areas within the marine sanctuary study region was determined by examining information concerning distribution and abundance of the region's living marine resources. The assumption of this examination was that an area which was important at the highest level of significance for the greatest number of species would be more valuable as a marine sanctuary than other study areas. This was tested by evaluating the "significance" of each study area based on geographical distributions for any life stage of a variety of species. The species selected for this analysis were those addressed in the West Coast of North America Coastal and Ocean Zones Strategic Assessment: Data Atlas, a NOAA publication. They included 19 species of invertebrates, 33 fishes, 22 marine birds, and 24 marine mammals. The following is a list of factors relating to this analysis.

- Each group of species (i.e., invertebrates, fishes, etc.) was treated separately, but examined similarly.
- The criterion for the analysis was the extent that the species used the study area (i.e., how much of a species' distribution covered the area) and the relative level of abundance of the species as shown in the atlas (e.g., occasional occurrence, adult area, major adult area, etc.).
- Scores were given to each area for every species as follows:
  - "3" for very significant presence. For this rating, at least one-quarter of the study area contained the highest level of abundance present off the contiguous U.S. West Coast (for any life stage), and most of the remaining portion of the study area contained other levels of abundance.
  - "2" for significant presence. This rating was given when at least half of the study area contained the at least the lowest level of abundance present off the West Coast.
  - "1" for present, but not significantly. This rating was given when less than half of the study area contained the lowest level of abundance present off the West Coast.
  - "0" for not present.
- A two-person team analyzed each group.
- No judgements were made regarding the importance of the species.
- After the team examined its group, the two team members compared their independent evaluations and reconciled scoring differences.

The relative significance of each area was then determined by summing the scores for all species in the group: the higher the cumulative total, the more important the area.

The above described analysis attempted to objectively examine qualitative information to derive the relative importance of one study area to another. However, the analysis was somewhat biased toward species with wide geographic distributions. For example, market squid pelagically occurs along most of the West Coast from coastal waters to far offshore, while Pacific razor clam is found only along sandy beaches at very restricted depths. Area 7, a shallow-water nearshore area, was scored identically for the two species, even though high concentrations of the razor clam occur in this area. The identical moderate score ("2") resulted because the razor clam concentrations occur only in a narrow band that was smaller than that identified for the highest rating ("3").

Because of possibly low rankings of limited-distribution species, a second analysis was performed on invertebrates and fishes. This analysis incorporated a "density index" into scoring species importance for each study area. Since all species examined have recreational and/or commercial importance, the density index was based on commercial and sport catch statistics for harvests in
Appendix E. Methodology ...(continued).

The index ranged from 10 to 1, depending upon harvest levels. For example, a heavily harvested species like Dungeness crab was assigned an index value of "10", the moderately harvested giant octopus was assigned an index value of "4", and the slightly harvested spot shrimp was assigned a value of "2". The study area score from the previous analysis was then multiplied by the density index and resulted in the following scores:

-21 to 30. This score was given to an area when it contained a widely distributed and highly abundant species.
-11 to 20. This score was assigned when the area contained a species that was either widely distributed or highly abundant.
-10 or less. This score was assigned when the area contained a species that only occasionally occurred there and not abundantly.

An area's relative importance was then determined by summing that area's scores for all species and comparing the totals for each area.
<table>
<thead>
<tr>
<th>Species (3)</th>
<th>Washington’s outer coast (1)</th>
<th>Washington in-state total (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>albacore</td>
<td>183,986</td>
<td>2,456,513</td>
</tr>
<tr>
<td>northern anchovy</td>
<td>171,111</td>
<td>78,864</td>
</tr>
<tr>
<td>Pacific herring</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>silver smelt</td>
<td>75,330</td>
<td>64,762</td>
</tr>
<tr>
<td>Pacific halibut</td>
<td>322,121</td>
<td>267,218</td>
</tr>
<tr>
<td>butter sole</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td>Dover sole</td>
<td>3,239,532</td>
<td>4,224,925</td>
</tr>
<tr>
<td>English sole</td>
<td>1,002,043</td>
<td>835,678</td>
</tr>
<tr>
<td>petrale sole</td>
<td>999,804</td>
<td>836,134</td>
</tr>
<tr>
<td>rex sole</td>
<td>130,157</td>
<td>93,849</td>
</tr>
<tr>
<td>rock sole</td>
<td>5,837</td>
<td>7,223</td>
</tr>
<tr>
<td>sand sole</td>
<td>197,417</td>
<td>50,852</td>
</tr>
<tr>
<td>sole spp.</td>
<td>13,854</td>
<td>12,550</td>
</tr>
<tr>
<td>sanddab</td>
<td>12,870</td>
<td>5,169</td>
</tr>
<tr>
<td>starry flounder</td>
<td>111,114</td>
<td>259,570</td>
</tr>
<tr>
<td>arrowtooth flounder</td>
<td>4,315,506</td>
<td>2,654,272</td>
</tr>
<tr>
<td>sablefish</td>
<td>6,219,161</td>
<td>6,034,711</td>
</tr>
<tr>
<td>lingcod</td>
<td>2,211,308</td>
<td>1,589,194</td>
</tr>
<tr>
<td>Pacific cod</td>
<td>3,273,366</td>
<td>4,773,738</td>
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<tr>
<td>walleye pollock</td>
<td>58,289</td>
<td>47,048</td>
</tr>
<tr>
<td>Pacific whiting</td>
<td>5,700</td>
<td>35,397</td>
</tr>
<tr>
<td>Pacific ocean perch</td>
<td>979,545</td>
<td>1,190,554</td>
</tr>
<tr>
<td>idiot rockfish</td>
<td>64,003</td>
<td>32,002</td>
</tr>
<tr>
<td>widow rockfish</td>
<td>5,223,678</td>
<td>2,611,839</td>
</tr>
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<td>yellowtail rockfish</td>
<td>4,846,618</td>
<td>2,423,309</td>
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<tr>
<td>rockfish spp.</td>
<td>16,190,859</td>
<td>3,910,067</td>
</tr>
<tr>
<td>rockfish oth.</td>
<td>2,544,913</td>
<td>1,272,457</td>
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<tr>
<td>striped seaperch</td>
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<td>0</td>
</tr>
<tr>
<td>pile perch</td>
<td>98</td>
<td>232</td>
</tr>
<tr>
<td>silver perch</td>
<td>128</td>
<td>12</td>
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<td>sculpins spp.</td>
<td>1,964</td>
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<td>sharks spp.</td>
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<td>2,761</td>
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<td>2,410</td>
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<td>thresher shark</td>
<td>60,144</td>
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</tr>
<tr>
<td>skates</td>
<td>103,732</td>
<td>55,180</td>
</tr>
<tr>
<td>chinook salmon</td>
<td>2,616,986</td>
<td>2,570,789</td>
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<tr>
<td>chum salmon</td>
<td>1,307,989</td>
<td>2,055,501</td>
</tr>
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<td>pink salmon</td>
<td>93,401</td>
<td>234</td>
</tr>
<tr>
<td>coho salmon</td>
<td>2,277,399</td>
<td>8,180,325</td>
</tr>
<tr>
<td>sockeye salmon</td>
<td>100,993</td>
<td>103,083</td>
</tr>
<tr>
<td>butter clam</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>cockles</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>horse clams</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>geoduck</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pacific littleneck</td>
<td>13,977</td>
<td>206</td>
</tr>
<tr>
<td>razor clam</td>
<td>103</td>
<td>94</td>
</tr>
<tr>
<td>Manila clam</td>
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<td>80,134</td>
</tr>
<tr>
<td>softshell clams</td>
<td>0</td>
<td>6,031</td>
</tr>
</tbody>
</table>
Table E.1 -- Estimated volumes (lbs) landed ... (continued)

<table>
<thead>
<tr>
<th>Species (3)</th>
<th>Washington's outer coast (1)</th>
<th>Washington in-state total (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>blue mussel</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>California mussel</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>mussels spp.</td>
<td>75</td>
<td>0</td>
</tr>
<tr>
<td>Olympia oyster</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pacific oyster</td>
<td>6,374,513</td>
<td>5,437,602</td>
</tr>
<tr>
<td>Kumamoto oyster</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>European oyster</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dungeness crab</td>
<td>5,067,139</td>
<td>14,546,162</td>
</tr>
<tr>
<td>coonstripe shrimp</td>
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<td>20</td>
</tr>
<tr>
<td>spot shrimp</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>sidestripe shrimp</td>
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<td>0</td>
</tr>
<tr>
<td>ocean pink shrimp</td>
<td>12,168,800</td>
<td>14,690,461</td>
</tr>
<tr>
<td>scallops</td>
<td>38,237</td>
<td>47,210</td>
</tr>
<tr>
<td>octopus</td>
<td>1,669</td>
<td>519</td>
</tr>
<tr>
<td>sea cucumbers</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>red sea urchin</td>
<td>0</td>
<td>7,030</td>
</tr>
<tr>
<td>green sea urchin</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Totals</td>
<td>70,374,485</td>
<td>90,335,415</td>
</tr>
</tbody>
</table>

Notes:
(1) Cape Flattery to Cape Disappointment; landings for anadromous species include harvests from coastal rivers.
(2) Includes outer coastal waters, the Strait of Juan De Fuca, Puget Sound, and Washington rivers (landings for Columbia River tributaries are incorporated).
(3) Estimates are based on 1987 and 1988 pounds landed by State of Washington statistical subarea provided by Dale Ward, Washington Department of Fisheries, Olympia, WA.
<table>
<thead>
<tr>
<th>Species (3)</th>
<th>Washington's outer coast (1)</th>
<th>Washington in-state total (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1987</td>
<td>1998</td>
</tr>
<tr>
<td>albacore</td>
<td>132,249</td>
<td>2,048,977</td>
</tr>
<tr>
<td>northern anchovy</td>
<td>56,742</td>
<td>29,945</td>
</tr>
<tr>
<td>Pacific herring</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>silver smelt</td>
<td>8,814</td>
<td>22,304</td>
</tr>
<tr>
<td>Pacific halibut</td>
<td>464,273</td>
<td>328,892</td>
</tr>
<tr>
<td>butter sole</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
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<td>488</td>
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<td>3,101</td>
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<td>168</td>
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<td>3,316</td>
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<td>cockies</td>
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<td>128</td>
<td>117</td>
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<td>Species (3)</td>
<td>Washington's outer coast (1)</td>
<td>Washington in-state total (2)</td>
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<td>Manila clam</td>
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<td>mussels spp.</td>
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<td>spot shrimp</td>
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<td>sidestripe shrimp</td>
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<td>green sea urchin</td>
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<td>Totals</td>
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<td>52,778,510</td>
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Notes:
(1) Cape Flattery to Cape Disappointment; landings for anadromous species include harvests from coastal rivers.
(2) Includes outer coastal waters, the Strait of Juan De Fuca, Puget Sound, and Washington rivers (landings for Columbia River tributaries are incorporated).
(3) Estimates are based on 1987 and 1988 pounds landed by State of Washington statistical subarea and extrapolations of average prices per pound provided by John Bishop, Fisheries Development Div., NMFS, NW Regional Office, Seattle.
REFERENCES
Sources for Information used in this report:


Personal communication on razor clams from Doug Simons, Washington Dept. of Fisheries, Montasano, WA.

Personal communication on razor clam harvests from Terry Link, Oregon Dept. of Fisheries and Wildlife, Astoria, OR.

Personal communication on Oregon seabirds from Roy Lowe, West Oregon Refuge Complex, U.S. Fish and Wildlife Service, Newport, Oregon.
Personal communications on freshwater flow and discharge from Steve Rohmann, Strategic Assessment Branch, OMA/NOAA, Rockville, MD.
APPENDIX D: TREATY OF OLYMPIA
TREATY WITH THE QUINIALT, ETC., 1855.

Articles of agreement and convention made and concluded by and between Isaac I. Stevens, governor and superintendent of Indian affairs of the Territory of Washington, on the part of the United States, and the undersigned chiefs, headmen, and delegates of the different tribes and bands of the Quinialt and Quillish-ute Indians, on the part of said tribes and bands, and duly authorized thereto by them.

ARTICLE 1. The said tribes and bands hereby cede, relinquish, and convey to the United States all their right, title, and interest in and to the lands and country occupied by them, bounded and described as follows: Commencing at a point on the Pacific coast, which is the southwest corner of the lands lately ceded by the Makah tribe of Indians to the United States, and running easterly with and along the southern boundary of the said Makah tribe to the middle of the coast range of mountains; thence southerly with said range of mountains to their intersection with the dividing ridge between the Chehalis and Quinialt Rivers; thence westerly with said ridge to the Pacific coast; thence northerly along said coast to the place of beginning.

ARTICLE 2. There shall, however, be reserved, for the use and occupation of the tribes and bands aforesaid, a tract or tracts of land sufficient for their wants within the Territory of Washington, to be selected by the President of the United States, and hereafter surveyed or located and set apart for their exclusive use, and no white man shall be permitted to reside thereon without permission of the tribe and of the superintendent of Indian affairs or Indian agent. And the said tribes and bands agree to remove to and settle upon the same within one year after the ratification of this treaty, or sooner if the means are furnished them. In the meantime it shall be lawful for them to reside upon any lands not in the actual claim and occupation of citizens of the United States, and upon any lands claimed or occupied, if with the permission of the owner or claimant. If necessary for the public convenience, roads may be run through said reservation, on compensation being made for any damage sustained thereby.

ARTICLE 3. The right of taking fish at all usual and accustomed grounds and stations is secured to said Indians in common with all citizens of the Territory, and of erecting temporary houses for the purpose of curing the same; together with the privilege of hunting, gathering roots and berries, and pasturing their horses on all open and unclaimed lands. Provided, however, That they shall not take...
shall fish from any bed staked or cultivated by citizens; and provided, also, that they shall alter all stallions not intended for breeding, and keep up and confine the stallions themselves.

ARTICLE 4. In consideration of the above cession, the United States agree to pay to the said tribes and bands the sum of twenty-five thousand dollars, in the following manner, that is to say: For the first year after the ratification hereof, two thousand five hundred dollars; for the next two years, two thousand dollars each year; for the next three years, one thousand six hundred dollars each year; for the next four years, one thousand three hundred dollars each year; for the next five years, one thousand dollars each year; and for the next five years, seven hundred dollars each year. All of which sums of money shall be applied to the use and benefit of the said Indians under the directions of the President of the United States, who may from time to time, determine at his discretion upon what beneficial objects to expend the same; and the superintendent of Indian affairs, or other proper officer, shall each year inform the President of the wishes of said Indians in respect thereto.

ARTICLE 5. To enable the said Indians to remove to and settle upon such reservation as may be selected for them by the President, and to clear, fence, and break up a sufficient quantity of land for cultivation, the United States further agree to pay the sum of two thousand five hundred dollars, to be laid out and expended under the direction of the President, and in such manner as he shall approve.

ARTICLE 6. The President may hereafter, when in his opinion the interests of the Territory shall require, and the welfare of the said Indians be promoted by it, remove them from said reservation or reservations to such other suitable place or places within said Territory as he may deem fit, on remunerating them for their improvements and the expenses of their removal, or may consolidate them with other friendly tribes or bands, in which latter case the annuities, payable to the consolidated tribes respectively, shall also be consolidated; and he may, farther, at his discretion, cause the whole or any portion of the lands to be reserved, or of such other lands as may be selected in lieu thereof, to be surveyed into lots, and assign the same to such individuals or families as are willing to avail themselves of the privilege, and will locate on the same as a permanent home, on the same terms and subject to the same regulations as are provided in the sixth article of the treaty with the Creeks, so far as the same may be applicable. Any substantial improvements heretofore made by any Indians, and which they shall be compelled to abandon in consequence of this treaty, shall be valued under the direction of the President, and payment made accordingly therefor.

ARTICLE 7. The annuities of the aforesaid tribes and bands shall not be taken to pay the debts of individuals.

ARTICLE 8. The said tribes and bands acknowledge their dependence on the Government of the United States, and promise to be friendly with all citizens thereof, and pledge themselves to commit no depredations on the property of such citizens; and should any one or more of them violate this pledge, and the fact be satisfactorily proven before the agent, the property taken shall be returned, or in default thereof, or if injured or destroyed, compensation may be made by the Government out of their annuities. Nor will they make war on any other tribe except in self-defence, but will submit all matters of difference between them and other Indians to the Government of the United States, or its agent, for decision and abide thereby; and if any of the said Indians commit any depredations on any other Indians within the Territory, the same rule shall prevail as is prescribed in this article in case of depredations against citizens. And the said tribes and bands agree not to shelter or conceal offenders against the laws of the United States, but to deliver them to the authorities for trial.
TREATY WITH THE QUINAAELT, ETC., 1855.

ARTICLE 9. The above tribes and bands are desirous to exclude from their reservations the use of ardent spirits, and to prevent their people from drinking the same, and therefore it is provided that any Indian belonging to said tribes who is guilty of bringing liquor into said reservations, or who drinks liquor, may have his or her proportion of the annuities withheld from him or her, for such time as the President may determine.

ARTICLE 10. The United States further agree to establish at the general agency for the district of Puget Sound, within one year from the ratification hereof, and to support for a period of twenty years, an agricultural and industrial school, to be free to the children of the said tribes and bands in common with those of the other tribes of said district, and to provide the said school with a suitable instructor or instructors, and also to provide a smithy and carpenter's shop, and furnish them with the necessary tools, and to employ a blacksmith, carpenter, and farmer for a term of twenty years, to instruct the Indians in their respective occupations. And the United States further agree to employ a physician to reside at the said central agency, who shall furnish medicines and advice to their sick, and shall vaccinate them; the expenses of the said school, shops, employees, and medical attendance to be defrayed by the United States, and not deducted from their annuities.

ARTICLE 11. The said tribes and bands agree to free all slaves now held by them, and not to purchase or acquire others hereafter.

ARTICLE 12. The said tribes and bands finally agree not to trade at Vancouver's Island or elsewhere out of the dominions of the United States, nor shall foreign Indians be permitted to reside on their reservations without consent of the superintendent or agent.

ARTICLE 13. This treaty shall be obligatory on the contracting parties as soon as the same shall be ratified by the President and Senate of the United States.

In testimony whereof, the said Isaac I. Stevens, governor and superintendent of Indian affairs, and the undersigned chiefs, headmen, and delegates of the above tribes and bands of Indians, have hereunto set their hands and seals, at Olympia, January 25, 1855, and on the Quinaielt River, July 1, 1855.

Isaac I. Stevens, Governor and Sup't of Indian Affairs.

*Signed by various tribal leaders.*

Executed in the presence of us; the words "ortracted," in the II. article, and "next," in the IV. article, being interlined prior to execution.

M. T. Simmons, special Indian agent.
H. A. Goldsborough, commissary,
R. F. Shaw, Interpreter.

James Tilton, surveyor-general
Washington Territory.
F. Kennedy.
J. Y. Miller.
H. D. Cook.
TREATY WITH THE HANAN, 1856.


ARTICLE 1. The said tribe hereby cedes, relinquishes, and conveys to the United States all their right, title, and interest in and to the lands and country occupied by it, bounded and described as follows, viz: Commencing at the mouth of the OKEHO River on the Straits of Fuca; thence running westwardly with said strait to Cape Classett or Flattery; thence southwardly along the coast to Osett, or the Lower Cape Flattery; thence easterly along the line of lands occupied by the Kweah-Cah or Kwillah-juke tribe of Indians, to the summit of the coast range of mountains, and thence northwardly along the line of lands lately ceded to the United States by the S'Klallum tribe to the place of beginning, including all the islands lying off the same on the straits and coast.

ARTICLE 2. There is, however, reserved for the present use and occupation of the said tribe the following tract of land, viz: Commencing on the beach at the mouth of the small brook running into Neech Bay next to the site of the old Spanish fort; thence along the shore round Cape Classett or Flattery; thence southwardly along the coast to Osett; thence following the said brook to the point where it enters the bay on the south side of said cape, a little above the Wachet village; thence following said brook to its source; thence in a straight line to the source of the first-mentioned brook, and thence following the same down to the place of beginning; which said tract shall be set apart, and so far as necessary surveyed and marked out for their exclusive use; nor shall any white man be permitted to reside upon the same without permission of the said tribe and of the superintendent or agent; but if necessary for the public convenience, roads may be run through the said reservation, the Indians being compensated for any damage thereby done them. It is, however, understood that should the President of the United States hereafter see fit to place upon the said reservation any other friendly tribe or band to occupy the same in common with those above mentioned, he shall be at liberty to do so.

ARTICLE 3. The said tribe agrees to remove to and settle upon the said reservation, if required so to do, within one year after the ratification of this treaty, or sooner, if the means are furnished them. In the meantime it shall be lawful for them to reside upon any land not in the actual claim and occupation of citizens of the United States, and upon any land claimed or occupied, if with the permission of the owner.

ARTICLE 4. The right of taking fish and of whaling or sealing at usual and accustomed grounds and stations is further secured to said Indians in common with all citizens of the United States, and of erecting temporary houses for the purpose of curing, together with the privilege of hunting and gathering roots and berries on open and unclaimed lands: Provided, however, That they shall not take shell-fish from any beds staked or cultivated by citizens.

ARTICLE 5. In consideration of the above cession the United States agree to pay to the said tribe the sum of thirty thousand dollars, in the following manner, that is to say: During the first year after the ratification thereof, three thousand dollars; for the next two years, twenty-
TREATY WITH THE MASH, 1863.

five hundred dollars each year; for the next three years, two thousand dollars each year; for the next four years, one thousand five hundred dollars each year; and for the next ten years, one thousand dollars each year; all which said sums of money shall be applied to the use and benefit of the said Indians, under the direction of the President of the United States, who may from time to time determine at his discretion upon what beneficial objects to expend the same. And the superintendent of Indian affairs, or other proper officer, shall each year inform the President of the wishes of said Indians in respect thereto.

ARTICLE 6. To enable the said Indians to remove to and settle upon their aforesaid reservation, and to clear, fence, and break up a sufficient quantity of land for cultivation, the United States further agree to pay the sum of three thousand dollars, to be laid out and expended under the direction of the President, and in such manner as he shall approve. And any substantial improvements heretofore made by any individual Indian, and which he may be compelled to abandon in consequence of this treaty, shall be valued under the direction of the President and payment made therefor accordingly.

ARTICLE 7. The President may hereafter, when in his opinion the interests of the Territory shall require, and the welfare of said Indians be promoted thereby, remove them from said reservation to such suitable place or places within said Territory as he may deem fit, on remunerating them for their improvements and the expenses of their removal, or may consolidate them with other friendly tribes or bands; and he may further, at his discretion, cause the whole, or any portion of the lands hereby reserved, or such other land as may be selected in lieu thereof, to be surveyed into lots, and assign the same to such individuals or families as are willing to avail themselves of the privilege, and will locate thereon as a permanent home, on the same terms and subject to the same regulations as are provided in the sixth article of the treaty with the Omahas, so far as the same may be practicable.

ARTICLE 8. The annuities of the aforesaid tribe shall not be taken to pay the debts of individuals.

ARTICLE 9. The said Indians acknowledge their dependence on the Government of the United States, and promise to be friendly with all citizens thereof, and they pledge themselves to commit no depredations on the property of such citizens. And should any one or more of them violate this pledge, and the fact be satisfactorily proven before the agent, the property taken shall be returned, or in default thereof, or if injured or destroyed, compensation may be made by the Government out of their annuities. Nor will they make war on any other tribe except in self-defence, but will submit all matters of difference between them and other Indians to the Government of the United States or its agent for decision and abide thereby. And if any of the said Indians commit any depredations on any other Indians within the Territory, the same rule shall prevail as that prescribed in this article in case of depredations against citizens. And the said tribe agrees not to shelter or conceal offenders against the United States, but to deliver up the same for trial by the authorities.

ARTICLE 10. The above tribe is desired to exclude from its reservation the use of ardent spirits, and to prevent its people from drinking the same, and therefore it is provided that any Indian belonging thereto who shall be guilty of bringing liquor into said reservation, or who drinks liquor, may have his or her proportion of the annuities withheld from him or her for such time as the President may determine.

ARTICLE 11. The United States further agree to establish at the general agency for the district of Puget's Sound, within one year from the ratification hereof, and to support for the period of twenty years, an agricultural and industrial school, to be free to children of the said tribe in common with those of the other tribes of said district and to
TREATY WITH THE MAKAH. 1866.

provide a smithy and carpenter's shop, and furnish them with the necessary tools and employ a blacksmith, carpenter and farmer for the like term to instruct the Indians in their respective occupations. Provided, however, That it should be deemed expedient a separate school may be established for the benefit of said tribe and such others as may be associated with it, and the like persons employed for the same purpose at some other suitable place. And the United States further agree to employ a physician to reside at the said central agency, or at such other school should one be established, who shall furnish medicine and advice to the sick, and shall vaccinate them: the expenses of the said school, shops, persons employed, and medical attendance to be defrayed by the United States and not deducted from the annuities.

Article 10. The said tribe agrees to free all slaves now held by its people, and not to purchase or acquire others hereafter.

Article 12. The said tribe finally agrees not to trade in Vancouver's Island or elsewhere out of the dominions of the United States, nor foreign Indians be permitted to reside in its reservation without consent of the superintendent or agents.

Article 14. This treaty shall be obligatory on the contracting parties as soon as the same shall be ratified by the President of the United States.

In testimony whereof, the said ISAAC L. STEVENS, governer and superintendent of Indian affairs, and the undersigned, chiefs, headmen and delegates of the tribe aforesaid have hereunto set their hands and seals at the place and on the day and year hereinafter written.

ISAAC L. STEVENS, governor and superintendent. [L. S.]

Bak-te-til, Neal village, his x mark.

Baht-te-til, Neal village, his x mark.

Cah-te-til, Neal village, his x mark.

Kal-te-til, Neal village, his x mark.

Kah-te-til, Neal village, his x mark.

Tah-te-til, Neal village, his x mark.

Klah-te-til, Neal village, his x mark.

Kal-ah-te-til, Neal village, his x mark.

Klah-te-til, Neal village, his x mark.

Klah-te-til, Neal village, his x mark.

Klah-te-til, Neal village, his x mark.

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Klah-te-til, Neal village, his x mark.

Klah-te-til, Neal village, his x mark.

Klah-te-til, Neal village, his x mark.

Klah-te-til, Neal village, his x mark.

Klah-te-til, Neal village, his x mark.

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Klah-te-til, Neal village, his x mark.

Klah-te-til, Neal village, his x mark.
TREATY WITH THE CHIPPEWA, 1855.

Executed in the presence of us. The words "five hundred" being first interlined in the 8th article, and erasures made in the 8th and 9th articles.

M. T. Simons, Indian agent.
George Gibbs, secretary.
B. F. Shaw, interpreter.
C. M. Hitchcock, M. D.
E. S. Fowler.
Orington Cushman.
Robt. Davis.

TREATY WITH THE CHIPPEWA, 1855.

Articles of agreement and convention made and concluded at the city of Washington, this twenty-second day of February, one thousand eight hundred and fifty-five, by George W. Marye, commissioner, on the part of the United States, and the following-named chiefs and delegates, representing the Mississippi bands of Chippewa Indians, viz: Pu-o-na-ke-shock, or Hole-in-the-day; Que-wa-sau-siah, or Bad Boy; Wand-a-ta-sa, or Little Hill; I-akoa-shou-wa-ke-shig, or Crossing Skye; Patud-dunce, or Rat’s River; Mun-o-ma-ni-kay-shein, or Rice-Maker; Mah-yah-ga-way-ge-dury, or the Chirster; Kay-poa-daux, or the Attempter; Cau-aug-te-won, or Cross Feather; and Shou-bush-king, or He that passes under Everything, and the following-named chiefs and delegates representing the Pillager and Lake Winnibigoshish bands of Chippewa Indians, viz: Aish-ke-bug-e-kasha, or Flat Mouth; Be-shock-las, or Buffalo; Nay-bun-a-caux, or Young Man’s Son; Maug-s-pau-bow, or Stepping Ahead; Mi-gi-ei, or Eagle, and Kow-de-mud-pee, or North Star, they being thereunto duly authorized by the said bands of Indians respectively.

ARTICLE 1. The Mississippi, Pillager, and Lake Winnibigoshish bands of Chippewa Indians hereby cede, sell, and convey to the United States all their right, title, and interest in, and to, the lands now owned and claimed by them, in the Territory of Minnesota, and included within the following boundaries, viz: Beginning at a point where the east branch of Snaka River crosses the southern boundary-line of the Chippewa country, east of the Mississippi River, as established by the treaty of July twenty-ninth, one thousand eight hundred and thirty-seven, running thence, up the said branch, to its source; thence, nearly north in a straight line, to the mouth of East Savannah River; thence, up the St. Louis River, to the mouth of East Swan River; thence, up said river, to its source; thence, in a straight line, to the most westerly band of Vermillion River; thence, northwestwardly, in a straight line, to the first and most considerable bend in the Big Fork River; thence, down said river, to its mouth; thence, down Rainy Lake River, to the mouth of Black River; thence, up that river, to its source; thence, in a straight line, to the northern extremity of Turtle Lake; thence, in a straight line, to the mouth of Wild Rice River; thence, up Red River of the North, to the mouth of Buffalo River; thence, in a straight line, to the southwestern extremity of Otter-Tail Lake; thence, through said lake, to the source of Leaf River; thence down said river, to its junction with Crow Wing River; thence down Crow Wing River, to its junction with the Mississippi River; thence to the commencement on said river of the southern boundary-line of the Chippewa country, as established by the treaty of July twenty-ninth, one thousand eight hundred and thirty-seven; and thence, along said line, to the place of beginning. And the said Indians do further fully and entirely relinquish and convey to the United States, any and all right, title, and
Coastal and Ocean Resources Historically Utilized by the Tribes
Identification of Fish, Shellfish, Waterfowl, and Plants Presently Relied on by Makah Peoples for Subsistence and Ceremonial Purposes

<table>
<thead>
<tr>
<th>Species</th>
<th>Period of Harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Fish</strong></td>
<td></td>
</tr>
<tr>
<td>1. Flatfish</td>
<td>All year</td>
</tr>
<tr>
<td>2. Halibut</td>
<td>All year</td>
</tr>
<tr>
<td>3. Lingcod</td>
<td>All year</td>
</tr>
<tr>
<td>4. Bottomfish</td>
<td>All year</td>
</tr>
<tr>
<td>5. Rockfish</td>
<td>All year</td>
</tr>
<tr>
<td>6. Smelt</td>
<td>Summer</td>
</tr>
<tr>
<td>7. Salmon</td>
<td>Primarily spring &amp; summer</td>
</tr>
<tr>
<td><strong>B. Invertebrates</strong></td>
<td></td>
</tr>
<tr>
<td>8. Barnacles</td>
<td>Spring and Summer</td>
</tr>
<tr>
<td>9. Mussels</td>
<td>All year</td>
</tr>
<tr>
<td>10. Hardshell clams</td>
<td>All year</td>
</tr>
<tr>
<td>11. Razor clams</td>
<td>May and June</td>
</tr>
<tr>
<td>12. Sea urchins</td>
<td>Summer</td>
</tr>
<tr>
<td>13. Chitons</td>
<td>Summer</td>
</tr>
<tr>
<td>14. Crabs</td>
<td>All year</td>
</tr>
<tr>
<td><strong>C. Waterfowl</strong></td>
<td></td>
</tr>
<tr>
<td>15. Ducks</td>
<td>Summer and fall</td>
</tr>
<tr>
<td>16. Sea Birds</td>
<td>Fall</td>
</tr>
<tr>
<td><strong>D. Plants</strong></td>
<td></td>
</tr>
<tr>
<td>17. Kelp</td>
<td>All year</td>
</tr>
</tbody>
</table>

Source: Northwest Indian Fisheries Commission; Makah Tribe.
<table>
<thead>
<tr>
<th>Period of the Year</th>
<th>Resources Harvested</th>
</tr>
</thead>
</table>
| May 1st through June                 | - A troll fishery is conducted in the ocean to the Makah southern boundary, and in the Straits in Area 4B to Sekiu River for chinook. Trolling for various species occurs year-round.  
  - Crab may be taken.  
  - Trolling for black cod and rock fish.                                                                                                                                 |
| July 1st through the first week in September | - Gillnet and troll fisheries for chinook, coho and pinks occur in Areas 4B, 5 and 6C.  
  - In the latter part of this period, a fishery for Fraser River sockeye occurs in the same areas.  
  - Taking of shellfish and sea urchins occurs on the ocean side of the reservation.  
  - Trolling for black cod and rock fish.                                                                                                                                 |
| Balance of September                 | - A possible directed gillnet fishery for coho in Areas 4B, 5 and 6C, although, due to conservation requirements, this fishery has not opened for several years.  
  - Shellfish harvest, including crab, continues.  
  - Sooos River fishery for chinook and coho.  
  - Similar fishery planned for the Hoko River in the future.  
  - Trolling for black cod and rock fish.                                                                                                                                 |
| October and early November           | - A gillnet fishery for chum in the straits commences.  
  - Take of shellfish and sea urchins continues.  
  - Sooos River fishery for chinook and coho.  
  - Similar fishery planned for the Hoko and the Waatch (coho only) in the future.  
  - Trolling for black cod and rock fish.                                                                                                                                 |
| November through January             | - Winter troll fishery for blackmouth (chinook).  
  - Shellfish harvesting continues.  
  - Steelhead fishing begins in the Hoko, Sail, Sekiu, Ozette, Sooos and Waatch Rivers on December 1st.                                                                                                                                 |
| February through April               | - Troll fishery for blackmouth continues.  
  - Trolling for black cod.  
  - Halibut fishery begins in March.  
  - Shellfish harvesting through March.  
  - In-river steelhead fishing continues through March.                                                                                                                                 |

*The Makah also harvest marine mammals for subsistence purposes.*

Fish and Shellfish Presently Relied on by Quileute Peoples for Subsistence and Ceremonial Purposes

<table>
<thead>
<tr>
<th>Species</th>
<th>Period of Harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Fish</strong></td>
<td></td>
</tr>
<tr>
<td>1. Halibut</td>
<td>Most of year, especially summer</td>
</tr>
<tr>
<td>2. Ling cod</td>
<td>Summer</td>
</tr>
<tr>
<td>3. Bottomfish</td>
<td>Summer</td>
</tr>
<tr>
<td>4. Rockfish</td>
<td>Summer</td>
</tr>
<tr>
<td>5. Ocean perch</td>
<td>Summer</td>
</tr>
<tr>
<td>6. Smelt</td>
<td>April to August</td>
</tr>
<tr>
<td>7. Salmon</td>
<td>Summer</td>
</tr>
<tr>
<td>8. Sturgeon</td>
<td>Summer</td>
</tr>
<tr>
<td><strong>B. Invertebrates</strong></td>
<td></td>
</tr>
<tr>
<td>9. Goose neck barnacles</td>
<td>Year round</td>
</tr>
<tr>
<td>10. Mussels</td>
<td>Year round</td>
</tr>
<tr>
<td>11. Hardshell clams</td>
<td>Year round</td>
</tr>
<tr>
<td>12. Razor clams</td>
<td>Year round</td>
</tr>
<tr>
<td>13. Sea urchins</td>
<td>Winter</td>
</tr>
<tr>
<td>14. Chitons</td>
<td>Winter</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Period</th>
<th>Resources Harvested</th>
</tr>
</thead>
</table>
| January through March | Winter steelhead fishing in-river  
Halibut fishing (subsistence and commercial)  
Goose neck barnacles, mussels, hardshell clams and razor clams  
Sea urchins and chitons |
| April               | Winter steelhead fishing in-river  
Halibut fishing (subsistence and commercial)  
Goose neck barnacles, mussels, hardshell clams and razor clams  
Smelt |
| May through June    | Spring Chinook in-river fishing  
Ocean fishing (primarily) on Columbia River chinook stocks  
Sockeye fishing in-river (non-directed)  
Halibut fishing (subsistence)  
Black cod and sablefish  
Smelt  
Goose neck barnacles, mussels, hardshell clams and razor clams |
| July                | Summer chinook and coho in-river  
Non-directed sockeye fishing in-river  
Ocean fishing for chinook and coho  
Halibut subsistence fishing  
Black cod, ling cod, bottomfish, rockfish and sablefish  
Smelt  
Ocean perch  
Sturgeon  
Goose neck barnacles, mussels, hardshell clams and razor clams |
| August              | Summer chinook and coho in-river  
Ocean fishing for chinook and coho  
Halibut subsistence fishing  
Black cod, ling cod, bottomfish, rockfish and sablefish  
Smelt  
Ocean perch  
Sturgeon  
Goose neck barnacles, mussels, hardshell clams and razor clams |
| September           | Ocean fishing for chinook and coho  
In-river fishing for fall chinook and fall coho  
Halibut subsistence fishing  
Black cod and sablefish  
Goose neck barnacles, mussels, hardshell clams and razor clams |
| October             | In-river fishing for fall chinook and fall coho  
Halibut subsistence fishing  
Black cod and sablefish  
Goose neck barnacles, mussels, hardshell clams and razor clams  
Sea urchins and chitons |
| November            | In-river fishing for fall chinook and fall coho  
In-river winter steelhead  
Goose neck barnacles, mussels, hardshell clams and razor clams  
Sea urchins and chitons |
| December            | In-river winter steelhead  
Goose neck barnacles, mussels, hardshell clams and razor clams  
Sea urchins and chitons |

Sources: Quileute Fisheries Department, Northwest Indian Fisheries Commission, 1990.
<table>
<thead>
<tr>
<th>Species</th>
<th>Period of Harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Fish</strong></td>
<td></td>
</tr>
<tr>
<td>1. Flatfish</td>
<td>Summer</td>
</tr>
<tr>
<td>2. Halibut</td>
<td>Summer</td>
</tr>
<tr>
<td>3. Ling cod</td>
<td>Summer</td>
</tr>
<tr>
<td>4. Bottomfish</td>
<td>Summer</td>
</tr>
<tr>
<td>5. Rockfish</td>
<td>Summer</td>
</tr>
<tr>
<td>6. Black bass</td>
<td>Summer</td>
</tr>
<tr>
<td>7. Ocean perch</td>
<td>Summer</td>
</tr>
<tr>
<td>8. Smelt</td>
<td>Spring/Summer/Fall</td>
</tr>
<tr>
<td>9. Salmon/steelhead</td>
<td>Year round</td>
</tr>
<tr>
<td>10. Sturgeon</td>
<td>Year round</td>
</tr>
<tr>
<td><strong>B. Invertebrates</strong></td>
<td></td>
</tr>
<tr>
<td>11. Barnacles</td>
<td>Year round</td>
</tr>
<tr>
<td>12. Mussels</td>
<td>Year round</td>
</tr>
<tr>
<td>13. Hardshell clams</td>
<td>Year round</td>
</tr>
<tr>
<td>14. Softshell clams</td>
<td>Year round</td>
</tr>
<tr>
<td>15. Razor clams</td>
<td>Year round</td>
</tr>
<tr>
<td>16. Oysters</td>
<td>Year round (Puget Sound)</td>
</tr>
<tr>
<td>17. Sea urchins</td>
<td>Year round</td>
</tr>
<tr>
<td>18. Limpets</td>
<td>Year round</td>
</tr>
<tr>
<td>19. Chitons</td>
<td>Year round</td>
</tr>
<tr>
<td>20. Crabs</td>
<td>Year round</td>
</tr>
<tr>
<td>21. Shrimp</td>
<td>Summer</td>
</tr>
<tr>
<td>22. Scallops</td>
<td>Summer</td>
</tr>
<tr>
<td>23. Anemones</td>
<td>Year round</td>
</tr>
<tr>
<td><strong>C. Seagull eggs</strong></td>
<td>Spring</td>
</tr>
<tr>
<td><strong>D. Sea weeds</strong></td>
<td>June/July</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Period</th>
<th>Resources Harvested</th>
</tr>
</thead>
<tbody>
<tr>
<td>September through November</td>
<td>River and some ocean fishing for fall Coho&lt;br&gt;End of summer steelhead&lt;br&gt;Start of winter steelhead&lt;br&gt;Sturgeon&lt;br&gt;Smelt&lt;br&gt;Goose neck barnacles&lt;br&gt;Mussels&lt;br&gt;Clams&lt;br&gt;Sea urchins, limpets and chitons&lt;br&gt;Crabs&lt;br&gt;Sea anemones, chinese slippers</td>
</tr>
<tr>
<td>December</td>
<td>In-river fall coho&lt;br&gt;In-river winter steelhead&lt;br&gt;Sturgeon&lt;br&gt;Smelt&lt;br&gt;Ling cod eggs&lt;br&gt;Goose neck barnacles&lt;br&gt;Mussels&lt;br&gt;Clams&lt;br&gt;Crabs&lt;br&gt;Sea urchins, limpets and chitons&lt;br&gt;Sea anemones&lt;br&gt;Octopus</td>
</tr>
</tbody>
</table>

Sources: Northwest Indian Fisheries Commission, 1989. Mr. James Jorgensen, Hoh Tribal Biologist.
<table>
<thead>
<tr>
<th>Period</th>
<th>Resources Harvested</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 1st</td>
<td>In-river winter steelhead</td>
</tr>
<tr>
<td>through</td>
<td>Sturgeon in-river and estuary</td>
</tr>
<tr>
<td>February</td>
<td>Goose neck barnacles</td>
</tr>
<tr>
<td></td>
<td>Mussels</td>
</tr>
<tr>
<td></td>
<td>Clams</td>
</tr>
<tr>
<td></td>
<td>Sea urchins, limpets and chitons</td>
</tr>
<tr>
<td></td>
<td>Crabs</td>
</tr>
<tr>
<td></td>
<td>Sea anemones</td>
</tr>
<tr>
<td></td>
<td>Ling cod eggs</td>
</tr>
<tr>
<td></td>
<td>Smelt</td>
</tr>
<tr>
<td></td>
<td>Octopus</td>
</tr>
<tr>
<td>March</td>
<td>In-river winter steelhead</td>
</tr>
<tr>
<td></td>
<td>Sturgeon</td>
</tr>
<tr>
<td></td>
<td>Goose neck barnacles</td>
</tr>
<tr>
<td></td>
<td>Mussels</td>
</tr>
<tr>
<td></td>
<td>Clams</td>
</tr>
<tr>
<td></td>
<td>Sea urchins, limpets &amp; chitons</td>
</tr>
<tr>
<td></td>
<td>Crabs</td>
</tr>
<tr>
<td></td>
<td>Sea anemones, chinese slippers</td>
</tr>
<tr>
<td></td>
<td>Ling cod eggs</td>
</tr>
<tr>
<td></td>
<td>Smelt</td>
</tr>
<tr>
<td></td>
<td>Octopus</td>
</tr>
<tr>
<td>April</td>
<td>In-river summer steelhead</td>
</tr>
<tr>
<td>through</td>
<td>River and ocean fishing for spring and summer chinook</td>
</tr>
<tr>
<td>May</td>
<td>Sturgeon</td>
</tr>
<tr>
<td></td>
<td>Bottom fish</td>
</tr>
<tr>
<td></td>
<td>Rockfish</td>
</tr>
<tr>
<td></td>
<td>Halibut</td>
</tr>
<tr>
<td></td>
<td>Smelt</td>
</tr>
<tr>
<td></td>
<td>Goose neck barnacles</td>
</tr>
<tr>
<td></td>
<td>Mussels</td>
</tr>
<tr>
<td></td>
<td>Clams</td>
</tr>
<tr>
<td></td>
<td>Sea urchins, limpets &amp; chitons</td>
</tr>
<tr>
<td></td>
<td>Crabs</td>
</tr>
<tr>
<td></td>
<td>Sea anemones, chinese slippers</td>
</tr>
<tr>
<td></td>
<td>Sea cucumbers</td>
</tr>
<tr>
<td></td>
<td>Seagull eggs</td>
</tr>
<tr>
<td>June</td>
<td>In-river summer steelhead</td>
</tr>
<tr>
<td>through</td>
<td>River and ocean fishing for spring and summer coho</td>
</tr>
<tr>
<td>August</td>
<td>Sturgeon</td>
</tr>
<tr>
<td></td>
<td>Bottom fish and rock fish</td>
</tr>
<tr>
<td></td>
<td>Halibut</td>
</tr>
<tr>
<td></td>
<td>Lingcod</td>
</tr>
<tr>
<td></td>
<td>Black bass</td>
</tr>
<tr>
<td></td>
<td>Ocean perch</td>
</tr>
<tr>
<td></td>
<td>Smelt</td>
</tr>
<tr>
<td></td>
<td>Goose neck barnacles</td>
</tr>
<tr>
<td></td>
<td>Mussels</td>
</tr>
<tr>
<td></td>
<td>Clams</td>
</tr>
<tr>
<td></td>
<td>Sea urchins, limpets and chitons</td>
</tr>
<tr>
<td></td>
<td>Crabs</td>
</tr>
<tr>
<td></td>
<td>Sea anemones, chinese slippers</td>
</tr>
</tbody>
</table>
## Identification of Fish, Shellfish, Waterfowl and Plants Presently Relied on by the Quinault Peoples for Subsistence and Ceremonial Purposes

<table>
<thead>
<tr>
<th>Species</th>
<th>Period of Harvest</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Fish</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Flatfish</td>
<td>Year round</td>
<td>Quinault reservation.</td>
</tr>
<tr>
<td>2. Halibut</td>
<td>Year round</td>
<td>Destruction Island/Grays Harbor.</td>
</tr>
<tr>
<td>3. Lingcod</td>
<td>Summer</td>
<td>Quinault reservation/Neah Bay</td>
</tr>
<tr>
<td>4. Bottomfish</td>
<td>Summer</td>
<td>Quinault reservation/Neah Bay</td>
</tr>
<tr>
<td>5. Rockfish</td>
<td>Summer</td>
<td>Throughout U&amp;A area.</td>
</tr>
<tr>
<td>7. Ocean Perch</td>
<td>Summer</td>
<td>Quinault reservation.</td>
</tr>
<tr>
<td>8. Smelt</td>
<td>Summer</td>
<td>Taholah, La Push.</td>
</tr>
<tr>
<td>9. Salmon</td>
<td>In seasons</td>
<td>All Quinault rivers.</td>
</tr>
<tr>
<td>10. Sturgeon</td>
<td>Fall/Winter</td>
<td>Queets/Quinault/Grays Harbor.</td>
</tr>
<tr>
<td>11. Eels</td>
<td>Fall</td>
<td>Quinault river.</td>
</tr>
<tr>
<td><strong>B. Invertebrates</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Barnacles</td>
<td>Year round</td>
<td>Cape Elizabeth &amp; Pt. Grenville areas.</td>
</tr>
<tr>
<td>2. Mussels</td>
<td>Year round</td>
<td>Cape Elizabeth, Raft R., Kalaloch &amp; Pt. Grenville areas.</td>
</tr>
<tr>
<td>3. Hardshell clams</td>
<td>Year round</td>
<td>Pt. Grenville, Taholah and Kalaloch areas.</td>
</tr>
<tr>
<td>4. Softshell clams</td>
<td>Spring/summer</td>
<td>Taholah area.</td>
</tr>
<tr>
<td>6. Oysters</td>
<td>Year round</td>
<td>Southern Bays/Hood Canal.</td>
</tr>
<tr>
<td>7. Sea urchins</td>
<td>Summer</td>
<td>Taholah area.</td>
</tr>
<tr>
<td>8. Limpets</td>
<td>Summer</td>
<td>Reservation area/Ruby Beach.</td>
</tr>
<tr>
<td>9. Crabs</td>
<td>Year round</td>
<td>Reservation shores.</td>
</tr>
<tr>
<td>10. Shrimp</td>
<td>Summer</td>
<td>Hood Canal.</td>
</tr>
<tr>
<td>13. Whelk</td>
<td>Year round</td>
<td>Queets area.</td>
</tr>
<tr>
<td>14. Octopus</td>
<td>Fall</td>
<td>Neah Bay.</td>
</tr>
<tr>
<td>15. Skate</td>
<td>Summer</td>
<td>Queets area.</td>
</tr>
<tr>
<td><strong>C. Waterfowl</strong></td>
<td></td>
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</tr>
<tr>
<td>1. Ducks</td>
<td>Year round</td>
<td>Quinault and Queets R. areas.</td>
</tr>
<tr>
<td>3. Geese</td>
<td>Fall</td>
<td>Quinault and Queets R. areas.</td>
</tr>
<tr>
<td><strong>D. Plants</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Kelp</td>
<td>Year round</td>
<td>Taholah area.</td>
</tr>
<tr>
<td>2. Seaweed</td>
<td>Year round</td>
<td>Taholah area.</td>
</tr>
</tbody>
</table>

Source: Northwest Indian Fisheries Commission.
Principal Harvest of Ocean Resources by the Quinault Indian Nation

<table>
<thead>
<tr>
<th>Period of the Year</th>
<th>Resources Harvested</th>
</tr>
</thead>
</table>
| September Ts okwanpitskitl (leaves are getting red on the vine maples) | Ocean trolling for salmon and other species. Fall chinook fishing on the Queets, Quinault, Humptulips, and Chehalis Rivers. Fishing for flatfish and halibut. Harvesting crab, clams, oysters, mussels, and barnacles. Kelp, seaweed, sea anemone, sea cucumber, and whelk gathering.
<table>
<thead>
<tr>
<th>Period of the Year</th>
<th>Resources Harvested</th>
</tr>
</thead>
</table>
| October Pan?silpaulos (time of autumn) | Start of eel season in-river.  
Fall chinook fishing on the Queets, Quinault, Humptulips, and Chehalis Rivers.  
Fishing for hatchery coho on the Queets, Quinault, Humptulips, and Chehalis rivers.  
Fishing for flatfish and halibut.  
Fishing for sturgeon.  
Fishing for river eels.  
Octopus gathering.  
Harvesting crab, clams, oysters, mussels, and barnacles.  
Kelp, seaweed, sea anemone, sea cucumber, and whelk gathering.  
Harvesting of ducks and geese. |
| November Panitpuhtuhkstista (time when the clouds are covering) | Chum and coho fishing in the Queets, Quinault, Humptulips, and Chehalis Rivers.  
Fishing for flatfish and halibut.  
Fishing for sturgeon.  
Fishing for river eels.  
Harvesting crabs, clams, oysters, mussels, and barnacles.  
Kelp, seaweed, sea anemone, sea cucumber, and whelk gathering.  
Harvesting of ducks and geese. |
| December Panpamas (time of cold) | Residual in-river coho fishing.  
Steelhead fishing in the Queets, Quinault, Humptulips, and Chehalis Rivers.  
Fishing for halibut and flatfish.  
Fishing for sturgeon.  
Harvesting crabs, clams, oysters, mussels, and barnacles.  
Kelp, seaweed, sea anemone, sea cucumber, and whelk gathering.  
Harvesting of ducks and geese. |
| January Autxaltaanem (after the sun comes back) | Steelhead fishing in the Queets, Quinault, Humptulips, and Chehalis Rivers.  
Fishing for halibut and flatfish.  
Fishing for sturgeon.  
Harvesting crabs, clams, oysters, mussels, and barnacles.  
Kelp, seaweed, sea anemone, sea cucumber, and whelk gathering. |
| February Panlaleah-kilech (time of the beach willow) | Steelhead fishing in the Queets, Quinault, Humptulips, and Chehalis Rivers.  
Commercial razor clam activity.  
Fishing for halibut and flatfish.  
Harvesting crabs, clams, oysters, mussels, and barnacles.  
Kelp, seaweed, sea anemone, sea cucumber, and whelk gathering. |
| March Panjans (time of the sprouts) | Steelhead fishing in the Queets, Quinault, Humptulips, and Chehalis Rivers.  
Commercial razor clam activity continues.  
Commercial halibut fishing commences.  
Start of fishing for spring chinook and blueback in the Quinault and Queets Rivers.  
Fishing for flatfish.  
Harvesting crabs, clams, oysters, mussels, and barnacles.  
Kelp, seaweed, sea anemone, sea cucumber, and whelk gathering. |

Source: Quinault Indian Nation, 1990.
APPENDIX F: SPECIES INHABITING HABITATS IN THE PROPOSED SANCTUARY
Appendix F: Species Inhabiting Habitats in the Proposed Sanctuary
HABITAT: UNPROTECTED BEACH SURF

TROPHIC LEVEL: (1) PRODUCER
INVERTEBRATES
CHAETOCEROS ARMATUM
DIATOM
TROPHIC LEVEL: (1) PRODUCER
NON-VASCULAR PLANTS
ASTRIONELLA SOCIALIS
DIATOM
TROPHIC LEVEL: (1) PRODUCER
VASCULAR PLANTS
PYLLOSPADIX SCOUleri
SCOUler'S SURFGRASS
TROPHIC LEVEL: (2) HERBIVORE
INVERTEBRATES
ENEODES COLLARIS
COLEOPTERA
TROPHIC LEVEL: (2) HERBIVORE
MAMMALS
ODOCOILEUS HEMIONUS COLUNBIANO
BLACK-TAILED DEER
TROPHIC LEVEL: (3) CARNIVORE
INVERTEBRATES
ALLONISCUS PERCONVEXUS
ISOPODS
CALLIANASSA CALIFORNIAE
GHOST SHRIMP
CIROMANA KINCAIDII
ISOPODS
COELOPA
KELP FLY
EUZONUS MUCRONATA
BLOOD WORMS
ORCHESTOIDEA CALIFORNIANA
SAND FLEE
SPIONIDAE
WORM
TROPHIC LEVEL: (5) OMNIVORE
INVERTEBRATES
CRAGO MIGRACALUDA
BLACK-TAILED SHRIMP
CRAGO SPP.
-NULL-
TROPHIC LEVEL: (5) OMNIVORE
FISHES
PHANERODON FURCATUS
WHITE SEAPERCH
TROPHIC LEVEL: (5) OMNIVORE
BIRDS
CORVUS BRACHYRHYNCHOS
COMHON CROW
TROPHIC LEVEL: (7) FILTER FEEDER
INVERTEBRATES
ARCHAEONYSIS GREBNITZKII
MYSID
EMERITA ANALOGA
TROPHIC LEVEL: (8) SCAVENGER
INVERTEBRATES
OLIVELLA BIPICICATA
PURPLE OLIVE SNAIL
TROPHIC LEVEL: (9) INVERTEBRATE EATER - INVERTEBRATES
ARENARIA INTERPRES
RUDDY TURNSTONE
CALIDRIS ALA
SANDBLINDER
CALIDRIS ALPINA
DUNLIN
CALIDRIS BAILOI
BAILO'S SANDPIPER
CALIDRIS CANUTUS
RED KNOT
CALIDRIS MAURI
WESTERN SANDPIPER
CHARADRIUS ALEXANDRINUS
SNOWY PLOVER
CHARADRIUS SEMIPALMATUS
SEMIPALMATED PLOVER
LINGCODROMUS GRISERUS
SHORT-BILLED DOWITCHER
LIMOSA FEDOR
MARLED GODWIT
HABITAT: UNPROTECTED BEACH SURF

NUMENIUS PHAEOPUS
WHIMBREL
PLUVIALIS SQUATAROLA
BLACK-BELLIED PLOVER

TROPHIC LEVEL: (O) UNKNOWN
INVERTEBRATES

HAUSTORIIDAE
AMPHIPOD
### HABITAT: PROTECTED BEACH SURF

<table>
<thead>
<tr>
<th>Trophic Level</th>
<th>Taxa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Producer)</td>
<td>Vascular Plants: Phyllospadix Scouleri, Plantago Maritima, Tenacetum Douglasii, Dune Tansy</td>
</tr>
<tr>
<td>2 (Herbivore)</td>
<td>Lumbinaris Zonata, Branta bernicla, Odocoileus hemionus columbianus, Steller's Sea Lion, Mustela frenata, Mus Mustela vison, Phoca vitulina, Zalophus californianus, California Sea Lion, Abarenicolica claparedii oceanic lugworm, Callianassa californiensis, Ghost Shrimp, Cirolana Kincaidi, Isopods, Euzonus mucronata, Blood Worm, Orchestia traskiana, Lesser Beach Hopper, Orchestia Orchestioidea, Californiana, Sand Flea, Great Beach Hopper, Spionidae, Worm, Crago nicaulis, Black-Tailed Shrimp, Crago spp.</td>
</tr>
<tr>
<td>3 (Carnivore)</td>
<td>Glyceridae: Proboscis Worm, Myoxocephalus polyacanthocephalus, Great Sculpin, Parophrys vetulus, English Sole, Platichthys Stellatus, Starry Flounder, Psetticthys melanosticcius, Sand Sole, Sebastes Paucispinis, Boccacio</td>
</tr>
<tr>
<td>6 (Parasite)</td>
<td>Malacobella spp., Ribbow Worm</td>
</tr>
<tr>
<td>8 (Scavenger)</td>
<td>Mephitis Mephitis, Striped Skunk, Peromyscus maniculatus, Deer Mouse, Procyon lotor, Raccoon</td>
</tr>
</tbody>
</table>
HABITAT: PROTECTED BEACH SURF

MICROGADUS PROXIMUS
PACIFIC TOMCOD

TROPHIC LEVEL: (9) INVERTEBRATE EATER - BIRDS

ACTITIS MACULARIA
SPOTTED SANDPIPER
ARENARIA INTERPRES
RUDDY TURNSTONE
ARENARIA MELANOCAPHA
BLACK TURNSTONE
CALIDRIS ALBA
SANDERLING
CALIDRIS ALPINA
DUNLIN
CALIDRIS BAIRDII
BAIRD'S SANDPIPER
CALIDRIS CANUTUS
RED KNOT
CALIDRIS MAURI
WESTERN SANDPIPER
CALIDRIS MINUTILLA
LEAST SANDPIPER
CHARADRIUS ALEXANDRINUS
SNOWY PLOVER
CHARADRIUS SEMIPALMATUS
SEMIPALMATED PLOVER
CHARADRIUS VOCIFERUS
KILLDEER
LIMNODROMUS GRISEUS
SHORT-BILLED DOWITCHER
LIMNODROMUS SCOLOPACEUS
LONG-BILLED DOWITCHER
LIMOSA FEDOA
MARBLED GODWIT
LOBIPES LOCATUS
NORTHERN PHALAROPE
NUMENIUS AMERICANUS
LONG-BILLED CURLEW
NUMENIUS PHAEOPUS
WHIMBREL
PLUVIALIS DOMINICA
AMERICAN GOLDEN PLOVER
PLUVIALIS SQUATAROLA
BLACK-BELLIED PLOVER
TRINGA MELANOCEPHALA
GREATER YELLOWLEGS

TROPHIC LEVEL: (0) UNKNOWN INVERTEBRATES

HAUSTORIIDAE
AMPHIPOD
## HABITAT: UNPROTECTED ROCKY SURF

### TROPHIC LEVEL: (1) PRODUCER

<table>
<thead>
<tr>
<th>Non-Vascular Plants</th>
</tr>
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<tbody>
<tr>
<td>Alaria nana</td>
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<tr>
<td>Bossea manza</td>
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<tr>
<td>Lophelia splendida</td>
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<tr>
<td>Bryopsis corticulans</td>
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<tr>
<td>Sea Fern</td>
</tr>
<tr>
<td>Callithamnion pikeyanum</td>
</tr>
<tr>
<td>Beauty Bush</td>
</tr>
<tr>
<td>Cladophora trichotoma</td>
</tr>
<tr>
<td>Green Ball</td>
</tr>
<tr>
<td>Codium fragile</td>
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<tr>
<td>Sea Staghorn</td>
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<tr>
<td>Codium setchellii</td>
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<tr>
<td>Spungy Cushion</td>
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<tr>
<td>Corallina gracilis</td>
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<tr>
<td>Graceful Coral</td>
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<tr>
<td>Costaria costata</td>
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<tr>
<td>Seesucker</td>
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<tr>
<td>Comaglia andersonii</td>
</tr>
<tr>
<td>Cymathere triplicata</td>
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<tr>
<td>Triple Rib</td>
</tr>
<tr>
<td>Cystoseira osmundacea</td>
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<tr>
<td>Woody Chain Bladder</td>
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<tr>
<td>Egregia menziesii</td>
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<tr>
<td>Feather Boa</td>
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<tr>
<td>Endocladia muricata</td>
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<tr>
<td>Nail Brush</td>
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<tr>
<td>Enteromorpha compressa</td>
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<tr>
<td>Green Confetti</td>
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<tr>
<td>Link Conchetti</td>
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<td>Enteromorpha plumosa</td>
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<tr>
<td>Silk Confetti</td>
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<tr>
<td>Grateloupia pinnata</td>
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<td>Pointed Lynx</td>
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<td>Sea Cabbage</td>
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<td>Veined Fan</td>
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<td>Iridescent Seaweed</td>
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<td>Laminaria andersonii</td>
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<td>Split Whip Wrack</td>
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<td>Laminaria platynemis</td>
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<td>Sea Girdle or Tangle</td>
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<td>Lithothamnium species</td>
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<td>Red Rock Crust</td>
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<td>Microcladina borealis</td>
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<td>Coarse Sea Lace</td>
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<tr>
<td>Pelvetiopsis limitata</td>
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<td>Pleurophybus gardneri</td>
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<td>Sea Spatula</td>
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<td>Polyp Pacific</td>
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<tr>
<td>Porphyra lancedata</td>
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<td>Red Jobt Lazer</td>
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<td>Porphyra perforata</td>
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<td>Presidola meridionalis</td>
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<td>Priapitus lyalli</td>
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<td>Ralfsia pacifica</td>
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<td>Tar Spot</td>
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<td>Schizymenia pacifica</td>
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<td>Sea Rose</td>
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<tr>
<td>Scytosiphon lomentaria</td>
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<tr>
<td>Whip Tube</td>
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<tr>
<td>Spomgomorpha coalita</td>
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<tr>
<td>Green Rope</td>
</tr>
<tr>
<td>Uropora mirabilis</td>
</tr>
</tbody>
</table>

### TROPHIC LEVEL: (2) HERBIVORE

### TROPHIC LEVEL: (3) CARNIVORE

### TROPHIC LEVEL: (4) DETRITIVORE

---

### BIRDS

- Aechmophorus occidentalis
- Western Grebe
- Cephus columba
- Pigeon Guillemot
- Cerorhyncus monacerrata
- Rhinoceros Auklet
- Gavia arctica
- Arctic Loon
- Haematopus bachmani
- Black Oystercatcher
- Histriornis histrionicus
- Harlequin Duck
- Larus argentatus
- Herring Gull
- Larus californicus
- California Gull
- Larus canus
- Mew Gull
- Larus heermani
- Heeeman's Gull
- Lunda ciriatrix
- Tufted Puffin
- Melanitta deglandi
- White-winged Scoter
- Pelecanus occidentalis
- Brown Pelican
- Phalacrocorax auritus
- Double-crested Cormorant
- Phalacrocorax pelagicus
- Pelagic Cormorant
- Phalacrocorax penicillatus
- Brandt's Cormorant
- Rissa tridactyla
- Black-legged Kittiwake
- Uria aalge
- Common Murre

---

### MAMMALS

- Enhydra lutris
- Sea Otter
- Eumetopias jubata
- Steller's Sea Lion
- Lutra canadensis
- River Otter
- Mirounga angustirostris
- Elephant Seal
- Mustela vison
- Mink
- Phoca vitulina
- Harbor Seal
- Zalophus californianus
- California Sea Lion

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### FISHES

- Anisodoris nobilis
- Sea Lion
- Pisaster giganteus
- Seastar
- Pisaster ochraceus
- Seastar
- Thais
- Snail

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### INVERTEBRATES

- Ascelichthys rhodorus
- Rosy Lip Sculpin
- Raja stellulata
- Starry Skate
- Sebastes melanops
- Black Rockfish
EUDISTYLIA VANCOUVERI SABELLID
SABELLARIA CEMENTARIUM WORM
TROPHIC LEVEL: (5) OMNIVORE
MAMMALS

PROCYON LOTOR RACCOON
TROPHIC LEVEL: (6) PARASITE
INVERTEBRATES

FABIA SUBQUADRATA PEA CRAB
HETEROSACCUS CALIFORNICUS "NULL"
TROPHIC LEVEL: (7) FILTER FEEDER
INVERTEBRATES

BALANUS GLANDULA BARNACLE
MYTILUS CALIFORNICANUS MUSSEL
NEANTHES BRANDTI WORM
POLLICIPES POLYMÉRUS PACIFIC GOOSE BARNACLE
VOLSELLA MODIOLUS HORSE MUSSEL
TROPHIC LEVEL: (8) SCAVENGER
BIRDS

LARUS GLAUCESCENS GLAUCOUS-WINGED GULL
LARUS OCCIDENTALIS WESTERN GULL
TROPHIC LEVEL: (9) INVERTEBRATE EATER - INVERTEBRATES

AMPHIPTERYX HOODOOTERUS REDTAIL SURFPERCH
CYTHOGASTER AGGREGATA SHINER PERCH
TROPHIC LEVEL: (9) INVERTEBRATE EATER - BIRDS

ACTITIS MACULARIA SPOTTED SANDPIPER
APHIZA VIRGATA SURF BIRD
ARENARIA INTERFACES RUDDY TURNSTONE
ARENARIA MELANOCEPHALUS BLACK TURNSTONE
CALIDRIS PILLINI ROCK SANDPIPER
HETEROSCELLUS INCANUS WANDERING TATTLER
NUMENIUS PHAEOPUS WHIMBREL
TROPHIC LEVEL: (9) UNKNOWN INVERTEBRATES

HAPLOGASTER CAVICAUDA CRAB
TROPHIC LEVEL: (9) INVERTEBRATE EATER - INVERTEBRATES

HABITAT: UNPROTECTED ROCKY SURF
HABITAT: PROTECTED ROCKY SURF

TROPHIC LEVEL: (1) PRODUCER

NON-VASCULAR PLANTS

MICROCLADIA COULTERI
DELICATE SEA LACE
PHELLODICTYOSIS LIMITATA
-NULL-
POTYLIUM PATISSIMA
CRISSCROSS NETWORK
POLYSIPHONIA COLLINSI
POLY COLLINS
POLYSIPHONIA PACIFICA
POLY PACIFIC
PORPHYRA LANCEOLATA
RED JABOT LAVER
PORPHYRA PURPORA
RED LAVER
PRASIOLA MERIDIINALIS
-NULL-
PILOTA FILICINA
RED WING
PILOTA HYPOIDIES
-NULL-
RALPHIA PACIFICA
TAR SPOT
RHODOMELA LARIX
BLACK PINE
RHODOMENIA PALMATA
DULSE OR RED KALE
RHODOMENIA PERTUSA
RED EYELET SILK
SCYTOPHYLLO MANTARIA
WHIP TUBE
SPONGOMORPHA COALITA
ULVA FENESTRATA
-NULL-
ULVA LACTUCA
SEA LETTUCE
ULVA LINZ
GREEN STRING LETTUCE

TROPHIC LEVEL: (2) HERBIVORE

INVERTEBRATES

JAUNEA CARNOSA
JAUNEA
PHYLLOSPADIX SCUOLERI
SCUOLER'S SURFGRASS
TANACETUM DOUGLASII
DUNE TANSY

TROPHIC LEVEL: (3) CARNIVORE

INVERTEBRATES

ACMAEA DIGITALIS
LIMPET
ACMAEA FENESTRATA
LIMPET
ACMAEA LINATULA
FILE LIMPET
ACMAEA MITRA
DUNE-CAP LIMPET
ACMAEA PELTA
BROWN & WHITE SHIELD LIMPET
AMPHITHEA NUMERALS
-NULL-
CALLISTOCNITA GRASSICOSTATUS
CHITON
CRYPTOCNITA STELLERI
GUM BOAT CHITON
CTANOPAX HARTMANN
CHITON

TROPHIC LEVEL: (2) HERBIVORE

INVERTEBRATES

AEOLIDIA PAPILLOSA
NUDIBRANCH
AMBLOPUSA SORONALIS
ROVE BEETLE
ANISODORIS NOBILIS
SEA LEMON
CANDLINA
NUDIBRANCH
CORANDE PACIFICA
NUDIBRANCH
DIAULOTIA DEMISSISSA
ROVE BEETLE
DIRONA ALBOLINATIA
NUDIBRANCH
LEPIDIZONA COOPERI
CHITON
LEPIDIZONA MERTENSI
CHITON
LIPAROCEPHALUS CORDICOLLIS
ROVE BEETLE
PISASTER GIGANTEUS
SEASTAR
PISASTER OCHRACEUS
SEASTAR
PLACIPHORELLA VELATA
CHITON
PYCNOGONUM STEARNS
SEA SPIDER
PYCNOPODIA HELIANTHODIES
SUNFLOWER STAR
ROSTANGA PULCHRA
NUDIBRANCH
SOLASTER DOMSONI
SEASTAR
SOLASTER SIMSONI
SEASTAR
THAIS
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<th>Organism</th>
<th>Trophic Level</th>
<th>Notes</th>
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<tbody>
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<td><strong>SNAIL</strong></td>
<td>(3) Carnivore</td>
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</tr>
<tr>
<td><strong>Artemia lateralis</strong></td>
<td></td>
<td>Smoothhead Sculpin</td>
</tr>
<tr>
<td><strong>Aselliscythere rhodorus</strong></td>
<td></td>
<td>Rosy Lip Sculpin</td>
</tr>
<tr>
<td><strong>Hemilepidotus hemilepidotus</strong></td>
<td></td>
<td>Red Irish Lord</td>
</tr>
<tr>
<td><strong>Hemilepidotus spinosis</strong></td>
<td></td>
<td>Brown Irish Lord</td>
</tr>
<tr>
<td><strong>Hexagrammos decagrammurus</strong></td>
<td></td>
<td>Kelp Greening</td>
</tr>
<tr>
<td><strong>Hexagrammos Lagocophalus</strong></td>
<td></td>
<td>Rock Greening</td>
</tr>
<tr>
<td><strong>Myxocophalus Polyacanthocephalus</strong></td>
<td></td>
<td>Great Sculpin</td>
</tr>
<tr>
<td><strong>Paraphysis vetulus</strong></td>
<td></td>
<td>English Sole</td>
</tr>
<tr>
<td><strong>Raja stellulata</strong></td>
<td></td>
<td>Starry Skate</td>
</tr>
<tr>
<td><strong>Scorpaeniychys marmoratus</strong></td>
<td></td>
<td>Cabezon</td>
</tr>
<tr>
<td><strong>Sebastes melanops</strong></td>
<td></td>
<td>Black Rockfish</td>
</tr>
<tr>
<td><strong>Xiphister atropurpureus</strong></td>
<td></td>
<td>Black Prickleback</td>
</tr>
<tr>
<td><strong>Habitat:</strong></td>
<td></td>
<td>PROTECTED ROCKY SURF</td>
</tr>
<tr>
<td><strong>Trophic Level:</strong> (3) Carnivore</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Chthyodes pacificus</strong></td>
<td></td>
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<tr>
<td><strong>Loxosceles occidentalis</strong></td>
<td></td>
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<tr>
<td><strong>Loxosceles atlanticus</strong></td>
<td></td>
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<tr>
<td><strong>Methuselah stimpsoni</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>Myotis californicus</strong></td>
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<tr>
<td><strong>Myotis californicus</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Phalanx purpureus</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>High Cockscomb</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Xiphister Mucrosus</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rock Prickleback</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Trophi Level:</strong> (5) Carnivore</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aythya marila</strong></td>
<td></td>
<td>Greater Scaup</td>
</tr>
<tr>
<td><strong>Corvus brachyrhynchos</strong></td>
<td></td>
<td>Common Crow</td>
</tr>
<tr>
<td><strong>Corvus corax</strong></td>
<td></td>
<td>Common Raven</td>
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<td><strong>Trophi Level:</strong> (5) Carnivore</td>
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<tr>
<td><strong>Invertebrates</strong></td>
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<tr>
<td><strong>Amphiodia occidentalis</strong></td>
<td></td>
<td>Brittle Star</td>
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<tr>
<td><strong>Amphitrite robusta</strong></td>
<td></td>
<td>Polychaete Worm</td>
</tr>
<tr>
<td><strong>Cucumaria miniata</strong></td>
<td></td>
<td>Sea Cucumber</td>
</tr>
<tr>
<td><strong>Eudistylia polyornophia</strong></td>
<td></td>
<td>Elephant Seal</td>
</tr>
<tr>
<td><strong>Mustela vision</strong></td>
<td></td>
<td>Mink</td>
</tr>
<tr>
<td><strong>Phoca vitulina</strong></td>
<td></td>
<td>Harbor Seal</td>
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<tr>
<td><strong>Notothenia japonica</strong></td>
<td></td>
<td>California Sea Lion</td>
</tr>
<tr>
<td><strong>Trophi Level:</strong> (6) Detritivore</td>
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</tr>
<tr>
<td><strong>Indenter expletiva</strong></td>
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<tr>
<td><strong>Balanus cariosus</strong></td>
<td></td>
<td>Barnacle</td>
</tr>
<tr>
<td><strong>Balanus glandula</strong></td>
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<td>Barnacle</td>
</tr>
<tr>
<td><strong>Buccinum proboscidea</strong></td>
<td></td>
<td>Spinoed Worm</td>
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<tr>
<td><strong>Bryozoa</strong></td>
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<tr>
<td><strong>Bryozoa</strong></td>
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<tr>
<td><strong>Bryozoa</strong></td>
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</tbody>
</table>
HABITAT: PROTECTED ROCKY SURF

HABITAT:
PROTECTED ROCKY SURF

PLOCAMIA KARYKINA
RED SPONGE
SERPULA VENICULARIS
WORM
SPIRORBIS
WORM
TEREBRATALIA TRANSVERSA
BRACHIPOD
TRICELLARIA OCCIDENTALIS
BROZOA
XESTOSPONGIA VANILLA
SPONGE

TROPHIC LEVEL: (8) SCAVENGER
INVERTEBRATES

HEMIGRAPSUS NUDUS
PURPLE SHORE CRAB
PACHYCHELES RUOIS
PORCELAIN CRAB
PAGURUS GRANOSIMANUS
HERMIT CRAB
PAGURUS HEMPHILLI
HERMIT CRAB
PAGURUS SAMUELSIS
HERMIT CRAB
PETROLISTHES CINCTIPES
PORCELAIN CRAB

TROPHIC LEVEL: (8) SCAVENGER
BIRDS

HALIAEUTUS LEUCOCEPHALUS
BALD EAGLE
LARUS GLAUCESCENTS
GLAUCOUS-WINGED GULL
LARUS OCCIDENTALIS
WESTERN GULL

TROPHIC LEVEL: (9) INVERTEBRATE
EATER - INVERTEBRATES

ALLORCHESTES ANGUSTUS
-NULL-
AMPHIPORUS BINACULATUS
RIBBON WORM
ANTHOPLEURA ELEGANTISSIMA
AGGREGATED ANEMONE
ANTHOPLEURA XANTHOGRAMMICA
GIANT GREEN ANEMONE
CANCER ANTENNARIUS
CRAB
CANCER MAGISTER
DUNGENESS CRAB
CANCER PRODUCTUS
CRAB
CEPHALOTHRIX LINEARIS
NEMEREAN
CERATOSTOMA
FOLIATUM MUREX
EMPLICTONEMA GRACILE
RIBBON WORM
EPIACTIS PROLIFERA
ANEMONE
GLYCERA AMERICANA
WORM
HALOSYDHA BREVISETOSA
SCALE WORM
HERMISSENDULA CRASSICORNIS
NUFIBRANCH

MICURA VERRILLI
NEMERTEAN
PARAMERMES PEREGRINA
NEMERTEAN
PHOBERICHELIDUM FENORATUM
SEA SPIDER
SPIRONTOCARIS BREVIROSTRIS
BROKEN BACK SHRIMP
SPIRONTOCARIS CRISTATA
BROKEN BACK SHRIMP
SPIRONTOCARIS PALUDICOLA
BROKEN BACK SHRIMP
SPIRONTOCARIS PRIONATA
BROKEN BACK SHRIMP
TEALIA CRASSICORNIS
ANEMONE
THALASSOTRECHUS BARBARAE NIGRIT
GROUND BEETLE

TROPHIC LEVEL: (9) INVERTEBRATE
EATER - FISHES

APODICHTHYS FLAVIDUS
PENPOINT GUNNEL
CHIROLOPHIS NUGATOR
MOSSHEAD VAR-BONNET
CLINOCOTTUS ACUCICEPS
SHARPNOSE SCULPIN
CLINOCOTTUS EMBRYUS
CALICO SCULPIN
CLINOCOTTUS GLOBICEPS
MOSSHEAD SCULPIN
CYMATOGASTER AGGREGATA
SHIYER PERCH
GOBIESOX MAENANDRUS
NORTHERN CLINGFISH
LEPTOCOTTUS ARMATUS
PACIFIC STAGHORN SCULPIN
LIPARIS FLORAE
TIDEPOOL SNAILFISH
OLIGOCOTTUS MACULOSUS
TIDEPOOL SCULPIN
OLIGOCOTTUS SYDNEI
FLUFFY SCULPIN
PHOLIS LAETA
CRESCENT GUNNEL
RHACOSILUS VACCA
PILE PERCH
SPIRINCHUS STARSKI
NIGHT SMELT
XERERPES FUCORUM
ROCKWEED GUNNEL

TROPHIC LEVEL: (9) INVERTEBRATE
EATER - BIRDS

ACTITIS MACULARIA
SPOTTED SANDPIPER
APHRIZA VIRGATA
SURFBIRD
ARENARIA INTERPRES
RUDDY TURNSTONE
ARENARIA MELANOCEPHALA
BLACK TURNSTONE
CALIDRIS ALPINA
DUNLIN
CALIDRIS PTLILOCENIS
ROCK SANDPIPER
HETEROSCELUS INCAEUM
WANDERING TATTLER
NUMENIUS PHAEOPUS

WHIMBREL
PLUVIALIS SQUATAROLA
BLACK-BELLIED PLOVER
TRINGA MELANOCEPHALA
GREATER YELLOWLEGS

TROPHIC LEVEL: (0) UNKNOWN
INVERTEBRATES

ANAITIDES MEDIPIHILLUS
PADDLE WORM
ARABELLA IRICOLOR
WORM
ASTRaea GIBBEROSA
SNAIL
CREPIDULA AUNCA
HORNED SLIPPER SHELL
CRYPTOPHINTHESES SITCHESEIS
UMBRELLA-BACKED CRAB
DODECACERIA FISTULICOLA
CIRRATULID WORM
HAPALOGASTER CACICUSDA
CRAB
LEPTASTERIA HEXACTIS
SEASTAR
LEPTASTERIA PUSILLA
SEASTAR
MINILUS FOLIATUS
CRAB
DEIGNATHUS INERMIS
CRAB
PATIRIA MINIATA
SEA BAT
PLATYNEREIS AGASSIZI
MEREID WORM
PUDARKE PUGGETTENSIS
POLYCHAETE
PUGETTIA PRODUCTA
KELP CRAB
SCYRA ACUTIFRONS
MASKING CRAB
TEGULA FUNERALIS
BLACK TURBAN SNAIL
## Trophic Level: (-)
**Vascular Plants**
- Anthoxanthum odoratum
- Sweet vernalgrass
- Holcus lanatus
- Common velvet-grass

## Trophic Level: (1) Producer
**Vascular Plants**
- Aira praeox
- Little hairgrass
- Alnus rubra
- Red alder
- Angelica lucida
- Sea-witch
- Arctostaphylos columbiana
- Bristly manzinita
- Archontophylos uva-ursi
- Kinnikinnick
- Arnertia menitima
- Thrift
- Baccharis pilularis
- Chaparral broom
- Blechnum spicant
- Deer fern
- Calamagrostis nutkaensis
- Reedgrass
- Castilleja litoralis
- Pacific paintbrush
- Ceanothus thyrsiflorus
- Blue blossom
- Cercastium arvense
- Field chickweed
- Cytisus scoparius
- Scotch broom
- Danthonia californica
- Catgrass
- Deschampsia caespitosa
- Tufted hairgrass
- Deschampsia longiflora
- Hairgrass
- Digitalis purpurea
- Foxglove
- Empetrum nigrum
- Crowberry
- Erigeron glaucus
- Seaside dock
- Festuca myuros
- Rat-tail fescue
- Festuca rubra
- Red fescue
- Fragaria chiloensis
- Coastal strawberry
- Galium nuttallii
- Nuttall’s bedstraw
- Gaultheria shallon
- Salal
- Gnaphalium chilense
- Cotton-battling plant
- Grindelia integrifolia var. ma
- Puget sound gumweed
- Heracleum lanatum
- Cow-parsnip

## Trophic Level: (2) Herbivore
**Herbivores**
- Paracunio alaskensis
- Hidg

## Trophic Level: (2) Invertebrate
- Bium: umbellus
- Ruffed grouse
- Cardulis pinus
- Pine siskin
- Cardulis tristis
- American goldfinch
- Carpolacus mexicanus
- House finch
- Carpolacus purpureus
- Purple finch
- Columa fasciata
- Band-tailed pigeon
- Dendragapus obscurus
- Blue grouse
- Hesperiphona vespertina
- Evening grosbeak
- Junco hyemalis
- Dark-eyed junco
- Lophortyx Californicus
- California quail
- Loxia curvirostra
- Red crossbill
- Melospiza melodia
- Song sparrow
- Melothrus ater
- Brown-headed cowbird
- Oreortyx pictus
- Mountain quail
- Passerella iliaca
- Fox sparrow
- Pneucticus melanocephalus
- Black-headed grosbeak
- Pipilo erythrophthalmus
- Rufous-sided towhee
- Selasphorus rufus
- Rufous hummingbird
- Spizella passerina
- Chipp ng sparrow
- Zenaida macroura
- Mourning dove
- Zonotrichia atricapilla
- Golden-crowned sparrow
- Zonotrichia leucophrys
- White-crowned sparrow

## Trophic Level: (3) Invertebrate
- Microtis longicaudus
- Long-tailed vole
HABITAT: HEADLANDS AND ROCKY ISLANDS

MICROTUS OREGONI
OREGON VOLE
THOMOMYS MONTICOLA
MOUNTAIN POCKET Gopher

TROPHIC LEVEL: (3) CARNIVORE
HERPETOFAUNA

THAMNOPHIS ORDINOIDES
NORTHWESTERN GARTER SNAKE
THAMNOPHIS SIRTALIS
COMMON GARTER SNAKE

TROPHIC LEVEL: (-)
HERPETOFAUNA

ACCIPITER COOPERII
COOPER’S HAWK
ACCIPITER STRIATUS
SHARP-SHINNED HAWK
AEGOLIUS ACADICUS
SAM-WHET OWL
ASIO OTUS
LONG-EARED OWL
BUO VIRGINIANUS
GREAT HORNED OWL
BUTEOD JAMAICENSIS
RED-TAILED HAWK
CEPPHUS COLUMBA
PIGEON GUILLEMOT
CERORHINCA MONOCERATA
RHINOCEROS AUKLET
FALCO PERSERGRINUS
PERSEGRINE FALCON
GLAUCIDION GNOMA
PYGMY OWL
LUNA CIRRHATA
TUFTED PUFFIN
OCEANODRUS FURCATA
FORK-TAILED STORM PETREL
OCEANODRUS LEUCORHOA
LEACH’S STORM PETREL
OTUS ASIO
SCREECH OWL
PHALOCROCRAX AURITUS
DOUBLE-CRESTED CORMORANT
PHALOCROCRAX PELAGICUS
PELAGIC CORMORANT
PHALOCROCRAX PENICILLATUS
BRAND’S CORMORANT
PYCNOCHERUS ALEUTICUS
CASSIN’S AUKLET
TYTO ALBA
BARN OWL
URIA AALGE
COMMON MURRE

TROPHIC LEVEL: (3) CARNIVORE
MAMMALS

LYNX RUFUS
BOBCAT
MUSTELA ERMINEA
SHORT-TAILED WEASEL
SPLLOGALE PUTORIUS
SPOTTED SKUNK
UROCYON CINERARGENTUS
GRAY FOX
VULPES FULVA
RED FOX

TROPHIC LEVEL: (3) CARNIVORE
BIRDS

BOMBICYLLA CEDRORUM
CEDAR WAXWING
CORVUS BRACHYRHYNCHOS
COMMON CROW
CORVUS CORVAX
COMMON RAVEN
CYANOCITTA STELLERI
STELLER’S JAY
PERISOREUS CANADENSIS
GRAY JAY
PIRANGA LUDOVICIANA
WESTERN TANAGER
STURNEUS VULGARIS
STANDING
TURDUS MIGRATORIUS
AMERICAN ROBIN

TROPHIC LEVEL: (5) OMNIVORE
MAMMALS

DIDELPHIS MARSUPIALIS
COMMON opposum
EURACTOS AMERICANUS
BLACK BEAR
METHYPS MAMMUS
STRIPED SKUNK
PEROMYSCUS MANICULATUS
DEER MOUSE
PROCION Lotor
RACCOON
ZAPUS TRINOTATUS
PACIFIC JUMPING MOUSE

TROPHIC LEVEL: (6) PARASITE
VASCULAR PLANTS

BOSCHNIAKA HOOKERI
SMALL GROUND-CONE

TROPHIC LEVEL: (8) INVERTEBRATE EATER - BIRDS

CATHERUS GUTTATUS
HERMIT THRUSH
CATHERUS USTULATUS
SWAINSON’S THRUSH
CERTHIA FAMILIARIS
BROWN CREEPER
CHAETURA VAUXI
VAUX’S SWIFT
CHAMAEA FASCIATA
WREN-TIT
CHordeiles Minor
COMMON NIGHTHawk
COLAPTES AURATUS
COMMON FLICKER
CONTopus SORDIDULUS
WESTERN WOOD PEEWEE
CTPSSEOLOIDES NIGER
BLACK SWIFT
DENDROICA CORONATA
YELLOW-RUMPED WARBLER
DENDROICA NIGRESCENS
BLACK-THROATED GRAY WARBLER
DENDROICA OCCIDENTALIS
HERMIT WARBLER
DENDROICA PECTECHIA
YELLOW WARBLER
DENDROICA TOWNSENDI
TOWNSEND’S WARBLER
DROCOCLUS PILEATUS
PILEATED WOODECKER
EMPIDONAX DIFFICILIS
WESTERN FLYCATCHER
EMPIDONAX HAMMONDI
HAMMOND’S FLYCATCHER
EMPIDONAX OBERHOLSERI
DUSKY FLYCATCHER
EMPIDONAX TRAILLII
WILLOW FLYCATCHER
HABITAT: HEADLANDS AND ROCKY ISLANDS

HIRUNDO RUSTICA
BARN SWALLOW
IRIDOPROCNE BICOLOR
TREE SWALLOW
IXOREUS NAEVIUS
VARIED THRUSH
MYAESTES TOWNSENDII
TOWNSEND'S SOLITAIRE
NUTTALLORNIS BOREALIS
OLIVE-SIDED FLYCATCHER
OPORORNIS TOLMIEI
MCGLAVRAY'S WARBLER
PARUS ATRICAPILLUS
BLACK-CAPPED CHICKADEE
PARUS RUFESCENS
CHESTNUT-BACKED CHICKADEE
PETROCHELIDON PYRRHONOTA
CLIFF SWALLOW
PICOIDES PUBESCENS
DOWNY WOODPECKER
PICOIDES VILLOSUS
HAIRY WOODPECKER
PROGNE SUBIS
PURPLE MARTIN
PSALTRIPARUS MINIMUS
BUSHITI
REGULUS CALENDULA
RUBY-CROWNED KINGLET
REGULUS SATRAPA
CROWNED KINGLET
SITTA CANADENSIS
RED-BREASTED NUTHATCH
SITTA CAROLINENSIS
WHITE-BREASTED NUTHATCH
SPHYRAGICUS VARIUS
YELLOW-BELLIED SAPSUCKER
STELgidopteryx RUFICOLLIS
ROUGH-WINGED SWALLOW
TACHYCNEMATA THALASSINA
VIOLET-GREEN SWALLOW
THRYOMANES BEWICKII
BEWICK'S WREN
TROGLODYTES AEDON
HOUSE WREN
TROGLODYTES TROGLODYTES
WINTER WREN
VERMIVORA CELATA
ORANGE-CROWNED WARBLER
VERMIVORA RUFICAPILLA
NAISHVILLE WARBLER
VIREO GILVIS
WARBLING VIREO
VIREO HUTTONI
HUTTON'S VIREO
VIREO SOLITARIUS
SOLITARY VIREO
WILSONIA PUSILLA
WILSON'S WARBLER

TROPHIC LEVEL: (9) INVERTEBRATE EATER - MAMMALS

EPHTESICUS FUSCUS
BIG BROWN BAT
MYOTIS LICIFUGUS
LITTLE BROWN MYOTIS
NEUROTIRICUS GIBBSII
SHREW-MOLE
SCAPANUS TOWNSENDII
TOWNSEND'S MOLE
**Habitat:** Headlands and Rocky Islands

**Trophic Level: (1) Producer**

<table>
<thead>
<tr>
<th>Non-Vascular Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asterionella formosa</td>
</tr>
<tr>
<td>Asterionella japonica</td>
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<tr>
<td>Asterionella kariana</td>
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<tr>
<td>Bacteriastrum delicatulum</td>
</tr>
<tr>
<td>Ceratium</td>
</tr>
<tr>
<td>Dinoflagellate</td>
</tr>
<tr>
<td>Chaetoceros compressus</td>
</tr>
<tr>
<td>Chaetoceros convolutus</td>
</tr>
<tr>
<td>Chaetoceros radicans</td>
</tr>
<tr>
<td>Coccolithophores</td>
</tr>
<tr>
<td>Coccoliths</td>
</tr>
<tr>
<td>Dactyliosolen mediterraneus</td>
</tr>
<tr>
<td>Fragilaria</td>
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<tr>
<td>Gonyaulax</td>
</tr>
<tr>
<td>Dinoflagellate</td>
</tr>
<tr>
<td>Leptocylindrus danicus</td>
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<tr>
<td>Melosira islandica</td>
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<tr>
<td>Other flagellates</td>
</tr>
<tr>
<td>Flagellates</td>
</tr>
<tr>
<td>Peridinium</td>
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<tr>
<td>Dinoflagellate</td>
</tr>
<tr>
<td>Rhizosolenia alata</td>
</tr>
<tr>
<td>Rhizosolenia delicatula</td>
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<tr>
<td>Rhizosolenia fragilissima</td>
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<tr>
<td>Syndra ulna</td>
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<tr>
<td>Thalassionema hantzschiioides</td>
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</table>

**Trophic Level: (2) Herbivore**

<table>
<thead>
<tr>
<th>Invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acartia clausi</td>
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<tr>
<td>Acartia danae</td>
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<tr>
<td>Acartia longiremis</td>
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<tr>
<td>Acartia negilgwise</td>
</tr>
<tr>
<td>Aetideopsis pacifica</td>
</tr>
<tr>
<td>Aetideus armatus</td>
</tr>
<tr>
<td>Aetideus pacificus</td>
</tr>
<tr>
<td>Amallotheta valida</td>
</tr>
<tr>
<td>Amallothrix vorak</td>
</tr>
<tr>
<td>Arietelhus plumifer</td>
</tr>
<tr>
<td>Bathyocalanus bradyi</td>
</tr>
<tr>
<td>BorocDISis</td>
</tr>
<tr>
<td>BorocDISis rostrata</td>
</tr>
<tr>
<td>Calanus cristatus</td>
</tr>
<tr>
<td>Calanus finmarchicus</td>
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<tr>
<td>Calanus plumchrus</td>
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<tr>
<td>Calanus tenijcornis</td>
</tr>
<tr>
<td>Calocalanus styliaris</td>
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<tr>
<td>Candacia bipinnata</td>
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<tr>
<td>Cavolina uncinata</td>
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<tr>
<td>Centraugaptilus porcellus</td>
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<tr>
<td>Centropages mcmurichii</td>
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<tr>
<td>Chirudina streetsi</td>
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<tr>
<td>Clausocalanus arcticornis</td>
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<tr>
<td>Clausocalanus pergens</td>
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<tr>
<td>Clio balantium</td>
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<tr>
<td>Corolla spectabilis</td>
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<tr>
<td>Ctenocalanus vanus</td>
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<tr>
<td>Epilabidocera amphitrites</td>
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<tr>
<td>Eucalanus attenuatus</td>
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<tr>
<td>Eucalanus bungii</td>
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<tr>
<td>Euchaeta spinosa</td>
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<tr>
<td>Euchirella curticauda</td>
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<tr>
<td>Eucopia</td>
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<tr>
<td>Evadne normannii</td>
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<tr>
<td>Gaetanus secundus</td>
</tr>
<tr>
<td>Gaetanus simplex</td>
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<tr>
<td>Gadius brevispinus</td>
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<tr>
<td>Gaidius variabilis</td>
</tr>
<tr>
<td>Gaussia princeps</td>
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</tbody>
</table>
HABITAT: EUPHOTIC PELAGIC

GIGANTOCYPRIS AGASSIZI
OSTRACOD
GNATHOPHAUSIA GIGAS
COPEPOD
GNATHOPHAUSIA INGENS
COPEPOD
HALOPTILUS PSEUDOXYCEPHALUS
COPEPOD
HETERORHABDUS TANNERI
COPEPOD
HETEROSTYLITES LONGICORNIS
COPEPOD
HETEROSTYLITES MAJOR
COPEPOD
LUCICUTIA BICORNUTA
COPEPOD
LUCICUTIA FLAVICORNIS
COPEPOD
METRIDEA LUCENS
COPEPOD
METRIDEA CURTICAUDA
COPEPOD
MICROCALANUS PYGMAEUS
COPEPOD
MICROSETALLA
COPEPOD
MIXTOCALANUS ROBUSTUS
COPEPOD
OITHONA
COPEPOD
ONCAEA CONFERA
COPEPOD
PARACALANUS PARVUS
COPEPOD
PAREUCHAETA BIROSTRATA
COPEPOD
PAREUCHAETA JAPONICA
COPEPOD
PHAENNA SPINIFERA
COPEPOD
PLEURONOMMA BOREALIS
COPEPOD
PLEUROMOMMA SCUTULLATA
COPEPOD
PONDON LEUCKARTI
CLADOCEAN
PSEUDOCALANUS MINUTUS
COPEPOD
PSEUDOCHEIRELLA POLYSPINNA
COPEPOD
RACOVITZANUS FORRECTOR
COPEPOD
RACOVITZANUS PACIFICA
COPEPOD
RHINOCALANUS NASUTUS
COPEPOD
SCAPHECALANUS MEDIUS
COPEPOD
SCAPHECALANUS MINUTUS
COPEPOD
SCAPHECALANUS SUBLONGATUS
COPEPOD
SCOLECITHECILLA MINOR
COPEPOD
SCOTTOCALANUS SEDATUS
COPEPOD
TORTANIS DISCAUDATUS
COPEPOD
UNDEUCHAETA INTERMEDIA
COPEPOD
UNDEUCHAETA MAJOR
COPEPOD
UNDEUCHAETA PLUMOSA
COPEPOD
TROPHIC LEVEL: (2) HERBIVORES
BIRDS
BRANTA NIGRICANS
BLACK BRANT
TROPHIC LEVEL: (3) CARNIVORES
INVERTEBRATES
ABRALOPSIS FELIS
SQUID
AEGINA CITREA
JELLYFISH
AEGIMURA GRIMALDI
JELLYFISH
AEQUOREA
JELLYFISH
AGLANTHA DIGITALE
JELLYFISH
ATOLLA VANHOEFFENI
JELLYFISH
ATOLLA UVELLEI
JELLYFISH
AURELIA LABIATA
JELLYFISH
BARGMANNIA
JELLYFISH
BEROE CUCUMIS
COMB JELLY
BRYTENIA BRUCEI
JELLYFISH
CALYCOPSIS NEMATOPHORA
JELLYFISH
CARANARIA JAPONICA
HETEROPOD
CHELOPHYES APPENDICULATA
JELLYFISH
CHELOPHYES MULTIDENTATA
JELLYFISH
CHIROTEUTHIS VERANYI
SQUID
CHUNGPHIES MOSERAE
JELLYFISH
COLOSSOCEA SERVICUM
JELLYFISH
CRANCHIA SCABRA
SQUID
CROSSOTA ALBA
JELLYFISH
CROSSOTA PEDUNCULATA
JELLYFISH
CROSSOTA ROBUSBRUNNEA
JELLYFISH
CUNINA OCTOMARIA
JELLYFISH
CYANEA
JELLYFISH
EUPHYSSA FURCATA
JELLYFISH
EUNOTIA INDICANS
JELLYFISH
GALITEUTHIS ARMATA
SQUID
GONATOPSIS BOREALIS
SQUID
TROPHIC LEVEL: (3) CARNIVORES
FISHES
ALOPHIS VULPINUS
THRESHER SHARK
BRAHYTETHUS FRENATUS
KELP PIRCH
HABITAT: EUPHOTIC PELAGIC

**STerna ParadoSAe**
**ARCTIC TERN**
**TROPHIC LEVEL: (3) CARNIVORE**
**BIRDS**

**Aechmophorus Occidentalis**
**Western Grebe**
**Brachyramphus Marmoratum**
**Marbled Murrelet**
**Cerorinca Monocerata**
**Rhinoceros Auklet**
**Clangula Hyemalis**
**Oldsquaw**
**Dicmedea Migripes**
**Black-footed Albatross**
**Fulmaris Glacialis**
**Northern Fulmar**
**Gavia Arctica**
**Arctic Loon**
**Gavia Immer**
**Common Loon**
**Gavia Stellata**
**Red-throated Loon**
**Histrionicus Histrionicus**
**Harlequin Duck**
**Larus Argentatus**
**Herring Gull**
**Larus Californicus**
**California Gull**
**Larus Canus**
**New Gull**
**Larus Delawarensis**
**Ring-billed Gull**
**Larus Glaucescens**
**Glacous-winged Gull**
**Larus Heermanni**
**Heerman’s Gull**
**Larus Occidentalis**
**Western Gull**
**Larus Philadelphia**
**Bonaparte’s Gull**
**Larus Thayeri**
**Thayers Gull**
**Lobipes Lobatus**
**Northern Phalarope**
**Lundrira Ciriuta**
**Tufted Puffin**
**Melanitta Deglandi**
**White-winged Scoter**
**Melanitta Nigra**
**Black Scoter**
**Melanitta Perspicillata**
**Surf Scoter**
**Mergris Senator**
**Red-breasted Merganser**
**Oceanodroma Furcata**
**Fork-tailed Storm-Petrel**
**Oceanodroma Leucorhoa**
**Leach’s Storm-Petrel**
**Pelecanus Occidentalis**
**Brown Pelican**
**Phalacrocorax Auritus**
**Double-crested Cormorant**
**Phalacrocorax Pelagicus**
**Pelagic Cormorant**
**Phalacrocorax Penicillatus**
**Brandt’s Cormorant**
**Phalaropus Fulicarius**
**Red Phalarope**
**Podiceps Auritus**
**Horned Grebe**
**Podiceps Greigii**
**Red-necked Grebe**
**Pygargus Aleutica**
**Cassin’s Auklet**
**Puffinus Bulleri**
**Buller’s Shearwater**
**Puffinus Carneipes**
** Flesh-footed Shearwater**
**Puffinus Creatopus**
**Pink-footed Shearwater**
**Puffinus Griseus**
**Scotty Shearwater**
**Puffinus Tenuirostris**
**Short-tailed Shearwater**
**Rissa Tridactyla**
**Black-legged Kittiwake**
**Sterna Caspia**
**Caspian Tern**
**Sterna Forsteri**
**Forster’s Tern**
**Sterna Hirundo**
**Common Tern**
**Synthliboramphus antiquum**
**Ancient Murrelet**
**Uria Aalge**
**Common Murre**
**Xema Sabini**
**Sabine’s Gull**

**TROPHIC LEVEL: (3) CARNIVORE**
**Mammals**

**Berardius Baird**
**Baird’s Beaked Whale**
**Callorhinus Ursinus**
**Northern Fur Seal**
**Delphinus Delphis**
**Common Dolphin**
**Eumetopias Jubatus**
**Northern or Stellar Sea Lion**
**Globicephala Macrorhynchus**
**Black Fish or Short-finned Pil**
**Grampus Griseus**
**Risso’s Dolphin**
**Kogia Breviceps**
**Pygmy Sperm Whale**
**Lagenorhynchus Obliquidens**
**Pacific Striped/Sided Dolphin**
**Phoca Vitulina**
**Harbor Seal**
**Phocoena Phocoena**
**Habor Porpoise**
**Phocoenoides Dallii**
**Dall Porpoise**
**Physeter Catodon**
**Sperm Whale**
**Pseudorca Crassidens**

**Eptatretus Deani**
**Black Hagfish**
**Eptatretus Stouti**
**Pacific Hagfish**
**Gadus macrocephalus**
**Pacific Cod**
**Galeorhinus Zyopterus**
**Soupfin Shark**
**Hexanchus Griseus**
**Sixgill Shark**
**Hydrocolus Colli**
**Ratfish**
**Lamna Ditropis**
**Salmon Shark**
**Merluccius Productus**
**Pacific Hake**
**Marone Saxatilis**
**Striped Bass**
**Notorynchus Maculatus**
**Spotted Cowshark or Sevengill**
**Oncorhynchus Gorbusca**
**Pink Salmon**
**Oncorhynchus Keta**
**Chum Salmon**
**Oncorhynchus Kisutch**
**Coho Salmon**
**Onchorhynchus Tshawytscha**
**Chinook Salmon**
**Prionace Glauca**
**Blue Shark**
**Raja Dingaiti**
**Black Skate**
**Raja Rhina**
**Longnose Skate**
**Raja Steflulata**
**Starry Skate**
**Salmo Clarks**
**Cutthroat Trout**
**Salmo Gairdneri**
**Steelhead Trout**
**Salvalinus Malma**
**Dolly Varden**
**Sebastes Alutus**
**Pacific Ocearperch**
**Sebastes Crameri**
**Blackmouth Rockfish or Darkblood**
**Sebastes Diploproa**
**Splitnose Rockfish**
**Sebastes Flavidus**
**Yellowtail Rockfish**
**Sebastes Pinneger**
**Canary Rockfish**
**Sebastolobus Alascanus**
**Shortspine Rockfish**
**Somniosus Pacificus**
**Pacific Sleeper Shark**
**Squalus Acanthias**
**Spiny Dogfish**
**Theragra Chalcogramma**
**Walleye Pollock**
**Torpedo Californica**
**Pacific Electric Ray**
**Triakis Semifasciata**
**Leopard Shark**

**TROPHIC LEVEL: (1) BIRDS**

**Cephus Columba**
**Pigeon Guillemot**

**TROPHIC LEVEL: (2) BIRDS**

**Bairdi**
**Baird’s Beaked Whale**
**Callorhinus Ursinus**
**Northern Fur Seal**
**Delphinus Delphis**
**Common Dolphin**
**Eumetopias Jubatus**
**Northern or Stellar Sea Lion**
**Globicephala Macrorhynchus**
**Black Fish or Short-finned Pil**
**Grampus Griseus**
**Risso’s Dolphin**
**Kogia Breviceps**
**Pygmy Sperm Whale**
**Lagenorhynchus Obliquidens**
**Pacific Striped/Sided Dolphin**
**Phoca Vitulina**
**Harbor Seal**
**Phocoena Phocoena**
**Habor Porpoise**
**Phocoenoides Dallii**
**Dall Porpoise**
**Physeter Catodon**
**Sperm Whale**
**Pseudorca Crassidens**
HABITAT: EUPHOTIC PELAGIC

FALSE KILLER WHALE
STENELLA COERULEOLBA
STRIPE DOLPHIN/GRAY'S PORPOISE
ZALOPHUS CALIFORNIANUS
CALIFORNIA SEA LION
ZIPHEUS CAVIROSTIS
CUvier's OR GOOSE BEAKED WHALE
STRIPED DOLPHIN/GRAY'S PORPOISE
ZALOPHUS CALIFORNIANUS
CALIFORNIA SEA LION
ZIPHEUS CAVIROSTIS
CUvier's OR GOOSE BEAKED WHALE

TROPHIC LEVEL: (5) OMNIVORE
INVERTEBRATES

BENTHEUPHAUSIA AMBLYOPS
EUPHASID
EUPHANUS PACIFICA
EUPHASID
NEMATELEPHANT FLEXIPES
EUPHASID
NEMATELEPHANT DIFFICILIS
EUPHASID
STYLOCHEIRON ABBRVIATUM
EUPHASID
STYLOCHEIRON LONGICORNE
EUPHASID
STYLOCHEIRON MAXIMUM
EUPHASID
TRESSABRACHTON OCLUDATUS
EUPHASID
TYHANOESSA GREGARIA
EUPHASID
TYHANOESSA INSPIINATA
EUPHASID
TYHANOESSA LONGIPES
EUPHASID
TYHANOESSA PARVA
EUPHASID
TYHANOESSA RASCHII
EUPHASID
TYHANOESSA SPINNERA
EUPHASID
THYSANOPODA ACUTIFRONS
EUPHASID
THYSANOPODA CORNUTA
EUPHASID
THYSANOPODA EGREIA
EUPHASID
TROPHIC LEVEL: (5) OMNIVORE
FISHES

SARDINOPS SAGAX
PACIFIC SARDINE
TROPHIC LEVEL: (6) PARASITE
FISHES

ENTOSPHUS TRIDENTATUS
PACIFIC LAMPREY
LAMNETR A AYRESI
RIVER LAMPREY
TROPHIC LEVEL: (6) PARASITE
BIRDS

CATNARACTA MCCORMICKI
SOUTH POLAR SKUA
STERCORARUS LONGICAUDIS
LONG-TAILED JAEGER
STERCORARUS PARASITICUS
PARASITIC JAEGER
STERCORARUS POMARINUS

POMARINE JAEGER
TROPHIC LEVEL: (7) FILTER FEEDER
INVERTEBRATES

DOLLOM
SALP
HELICOSCALPA VIRGULA
SALP
IASS ZONARIA
SALP
OKIOLEPE
LARVAEAN
PEGEA CONFEDERATA
SALP
SALPA FUSIFORMIS
SALP
THALIA DEMOCRATICA
SALP
THENTS VAGINA
SALP

TROPHIC LEVEL: (7) FILTER FEEDER
MAMMALS

BALLENA GLACIALIS
BLACK OR PACIFIC RIGHT WHALE
BALLENOPTERA ACUTOFOSTRATA
MINKE WHALE
BALLENOPTERA BOREALIS
SEI WHALE
BALLENOPTERA MUSCULUS
BLUE WHALE
BALLENOPTERA PHYSALUS
FINBACK OR FIN WHALE
MEGAPTERA NOVEANGLIAE
HUMPBACK WHALE

TROPHIC LEVEL: (9) INVERTEBRATE EATER - INVERTEBRATES

ACANTHEPHYRA CURTIROSTRIS
SHRIMP
BENTHODEGONEMA
SHRIMP
BENTHODEGONEMA BOREALIS
SHRIMP
CYSTISOMA FABRICII
AMPHIPOD
DAIRELLA CALIFORNICUS
AMPHIPOD
EURODINIA BATHEPHELACICA
ARROW-WORM
EURODINIA FOWLERI
ARROW-WORM
EURODINIA HAMATA
ARROW-WORM
GENDADUS INCERATUS
SHRIMP
GENDADUS PROPINQUUS
SHRIMP
HYMENOCODA FRONTALIS
SHRIMP
HYMENOCODA GLACIALIS
SHRIMP
HYMENOCODA GRACILIS
SHRIMP
HYPERIA HYSTRIX
AMPHIPOD
HYPEROCHE DEDUSARUM
AMPHIPOD

LANCILLA LOVENI
AMPHIPOD
LYCAEA PULEX
AMPHIPOD
MENICODORUS MOLLIS
SHRIMP
MENOGENA
POLYCHAETE WORM
NOTOSTOMUS JAPONICUS
SHRIMP
OXYCHELUS CLAUSI
AMPHIPOD
PARAPISOA CRISTATA
SHRIMP
PARAPISOA SUICATIFRONS
SHRIMP
PARAPISOA IRONINA CRASSIPES
AMPHIPOD
PARAPISOA IRONINA GRACILIS
AMPHIPOD
PARATELMISTOS PACIFICA
AMPHIPOD
PASIPHEA CHACET
SHRIMP
PASIPHEA MAGNA
SHRIMP
PASIPHEA PACIFICA
SHRIMP
PETALODIUM SUSPIROSUM
SHRIMP
PHRONIA SEPTENTRIONIS
AMPHIPOD
PHRONIA KOPIS SPINIFERA
AMPHIPOD
POEOBIRIS MESSER
POLYCHAETE WORM
PRIMO ABYSSALIS
AMPHIPOD
PRIMO MACROPA
AMPHIPOD
RHYNCHONEREELLA ANGELINII
POLYCHAETE WORM
SAGITTA BIERII
ARROW-WORM
SAGITTA DECIPIENS
ARROW-WORM
SAGITTA ELEGANS
ARROW-WORM
SAGITTA EUNERISETICA
ARROW-WORM
SAGITTA MACROCEPHALA
ARROW-WORM
SAGITTA MAXIMA
ARROW-WORM
SAGITTA MINIMA
ARROW-WORM
SAGITTA SCRIPPSAE
ARROW-WORM
SAGITTA ZENETOS
ARROW-WORM
SCINA CASSICORNIS BURMUDENSIS
AMPHIPOD
SEGSTE SIMILIS
SHRIMP
SERGIA SEMIRENIS
SHRIMP
STREETS A CHALLENGER
AMPHIPOD
STYELLEPSIS BANZERI
SHRIMP
HABITAT: EUPHOTIC PELAGIC

TROPHIC LEVEL: (9) INVERTEBRATE EATER - FISHES

ALLOSMERUS ELONGATUS
WHITEBAIT SMELT
ALOSA SAPIDISSINA
AMERICAN SHAD
AMMODYTES HEXAPTERUS
PACIFIC SAND LANCE
AMPHISTICHUS RHOODERUS
REDTAIL SURFPERCH
ATHERINOPS AFFINIS
TOPSMELT
CETORNINUS MAXIMUS
BASKING SHARK
CLUPEA HARENGUS PALLASI
PACIFIC HERRING
COLOLABIS SAIKA
PACIFIC SAURY
CYNOMATOGASTER AGGREGATA
SHINER PERCH
EMBIOCTOPUS LATERALIS
STRIPED SEAPERCH
ENGRaulis MORDAK
NORTHERN ANCHOVY
HYPOMEUSUS PRETIOUS
SURFSHELL
MICROGADUS PROXIMUS
PACIFIC TOMCOD
ONCORHYNCHUS HERKA
SOCKEYE SALMON
PSYCHROLUTES PARADOXUS
TADPOLE SCULPIN
SPRINCHUS STARKSI
NIGHT SURF SMELT
SPRINCHUS THALEICHTHYS
LONGFIN SMELT
THALEICHTHYS PACIFICUS
EULACHON OR COLUMBIA RIVER SMELT

TROPHIC LEVEL: (9) INVERTEBRATE EATER - BIRDS

AYTHIA NARILA
GREATER SCAUP
HABITAT: DISPHOTIC PELAGIC

PSEUDOCALANUS MINUTUS COPEPOD
PSEUDOCIRELLA POLYSPINA COPEPOD
RACOVITZANUS FORRECTA COPEPOD
RACOVITZANUS PACIFICUS COPEPOD
RHICANALUS NASUTUS COPEPOD
SCAPHOCALANUS MEDIUS COPEPOD
SCAPHOCALANUS MINUTUS COPEPOD
SCAPHOCALANUS SUBELONGATUS COPEPOD
SCLOCLEITHRICELLA MINOR COPEPOD
SCOTOCALANUS SEDATUS COPEPOD
TORTANIS DISCAUDATUS COPEPOD
UNDEUCHAETA INTERMEDIA COPEPOD
UNDEUCHAETA MAJOR COPEPOD
UNDEUCHAETA PLUMOSA COPEPOD

TROPHIC LEVEL: (3) CARNIVORE

INKVERTEBRATES

ABRALIOPSIS FELIS SQUID
AEGINA CITREA JELLYFISH
AEGINURA GRIMALDII JELLYFISH
AEQUOREA JELLYFISH
AGLANTHA DIGITALE JELLYFISH
ATOLLA VANHOEFFENI JELLYFISH
ATOLLA WYVILLEI JELLYFISH
AURELIA LABIATA JELLYFISH
BARGMANNIA JELLYFISH
BEROE CUCUMIS COMB JELLY
BOTRYNEMA BRUCEI JELLYFISH
CALYCTOPSIS NAMATOPHORA JELLYFISH
CARANARIA JAPONICA JELLYFISH
CHELOPHYES APPENDICULATA JELLYFISH
CHELOPHYES MULTIDENTATA JELLYFISH
CHIROEUTHUS VERANYI SQUID
CHUNIOPHYES MOSERAE JELLYFISH
COLOBONEMA SERVICEUM JELLYFISH
CRANCHIA SCABRA SQUID
CROSSOTA ALBA JELLYFISH

JELLYFISH CROSSTOTA PEDUNCULATA JELLYFISH
JELLYFISH CROSSTOTA RUFOBRUNEA JELLYFISH
JELLYFISH CUNINA OCTONARIA JELLYFISH
JELLYFISH CYNEA JELLYFISH
JELLYFISH EUPHYSSA FURCATA JELLYFISH
JELLYFISH EUTONIA INDICANS JELLYFISH
JELLYFISH GALITEUTHIS ARNATA SQUID
JELLYFISH GONATOPSIS BOREALIS SQUID
JELLYFISH GONATOPSIS ANONYCHUS SQUID
JELLYFISH GONATOPSIS FABRICII SQUID
JELLYFISH GONATOPSIS MAGISTER SQUID
JELLYFISH HALICREAS MINIMUM JELLYFISH
JELLYFISH HALISTARIA CELLULARIA JELLYFISH
JELLYFISH HISTIOEUTHIS HETEROPSIS SQUID
JELLYFISH JAPETELLA HEATHI OCTOPUS
JELLYFISH LENSIA CONOIDEA JELLYFISH
JELLYFISH LIMACINA HELACINA PTEROPOD
JELLYFISH LOLIGO OPALESCENS SQUID
JELLYFISH MOROTEUTHIS ROBUSTA SQUID
JELLYFISH MUGGIAEA ATLANTICA JELLYFISH
JELLYFISH NAMONIA CARA JELLYFISH
JELLYFISH OCTOPOTEUTHIS SICULA SQUID
JELLYFISH OCTOPUS OCTOPUS
JELLYFISH OCTOPUS OCTOPUS
JELLYFISH OMYNOTEUTHIS BANKSI SQUID
JELLYFISH PANTACHOGON HAEKELI JELLYFISH
JELLYFISH PARAPHYLLINA RASMONI JELLYFISH
JELLYFISH PERIPHYLLA PERIPHYLLA JELLYFISH
JELLYFISH PHYSOPHORA HYDROSTATIC JELLYFISH
JELLYFISH PLEUROBRANCHIA PILEUS COMB JELLY
JELLYFISH PRAYA DUBIA JELLYFISH
JELLYFISH PRAYA RETICULATA JELLYFISH
JELLYFISH PTEROTRACHAEA SCUTATA PTEROPOD
JELLYFISH ROSSIA PACIFICA SQUID
JELLYFISH SARSIA PRINCEPS JELLYFISH
JELLYFISH SARSIA TUBULOSA JELLYFISH
JELL FISH
SOLMISUS INCISA JELL FISH
SOLMISUS MARSHALLI JELL FISH
SOLMISUS OGINOPLAX JELL FISH
SOLMISUS QUINTODENTALIS JELL FISH
TGNISIS PAIO SQUID
VAMPTOIDEUTHIS INFERNALIS SQUID
VOTIIS SPINOSA JELL FISH

TROPHIC LEVEL: (3) CARNIVORE

FISHE:

ALOPIIS VULPINUS THRE HER SHARK
ANDOPOMA FIMBRIA SABLFISH
CHAULODUS MACONI PACIFIC VIPERFISH
CORYLI AEOIDIES ACRILEPIS ROUGI SCALE RATTAIL
EFTATIETUS DEANI BLACK HAGFISH
EFTATIETUS STOURI PACIFIC HAGFISH
GALEOHINUS ZYOTERICUS SQUID
HENANUS GRISIUS SQUID
HEXANUS MARGINELUS SQUID
HYDROAGUS COLLEI RATTISH
LAMNINA DIOTRIS SICKLE SHARK
LAMNUS HAGFISH MERRULICUS PRODUCTUS FISH
NOTORYNCHUS MACULATUS SPOTTED COWSHARK OR SEVENGILL
ONCORYNCHUS GOEBUSCHIA PINK SALMON
ONCORYNCHUS KEI CHUM SALMON
ONCORYNCHUS KISJUTCH ONCORHYNCHUS KISJUTCH
COHO SALMON
ONCORYNCHUS TSISHTSCHA ONCORHYNCHUS TSISHTSCHA
CHINOOK SALMON
PORICHYNYS NOTATUS PLAINFIN MIDSHIPMEN
PRIOMACE GLAUCUS BLUE SHARK
RAJA KINCAIDII BLACK SKATE
RAJA KINCAIDII BLACK SKATE
RAJA PRIMA LONGNOSKATE
RAJA STELLULARA STARSKY SKATE
SALMO CLARKI CUTTROAT TROUT
SALMO GORDONI STEELEHEAD TROUT
SALVELINUS MACILvae SALVIE MAHNA
SALVELINUS WYNN DOLLY VARDEN
SEBASTES ALUTUS PACIFIC OCEAN PERCH
SEBASTES CRAMERI BLACKMOUTH ROCKFISH OR}

DARKBLOOD
HABITAT: DISPHOTIC PELAGIC

SEBASTES DILOPEOA
SPLITNOSE ROCKFISH
SEBASTES ELONGATUS
GREENSTRIPED ROCKFISH
SEBASTES FLAVIDUS
YELLOWTAIL ROCKFISH
SEBASTES PINNIGER
CANARY ROCKFISH
SEBASTOLOBUS ALASCANUS
SHORTSPINE ROCKFISH
SQUALUS ACANTHIAS
SPINY DOGFISH
TACTOSTOMA MACROPUS
LONGFIN DRAGONFISH
THERAGRA CHALCOGRAMMA
WALLEYE POLLOCK
TORPEDO CALIFORNICA
PACIFIC ELECTRIC RAY
TROPHIC LEVEL: (3) CARNIVORE
MAMMALS
BERARDIUS BAIRD
BAIRD'S BEAKED WHALE
CALLORHINUS URINUS
NORTHERN FUR SEAL
KOGIA BREVICEPS
PYGMY SPERM WHALE
LISSODELPHIS BOREALIS
NORTHERN RIGHT WHALE DOLPHIN
MESOPOLODON STEJNEGERI
STEJNEGER'S BEAKED WHALE
ORCINUS ORCA
KILLER WHALE
PHOCOENA PHOCOENA
HARBOR PORPOISE
RHOCOENOIDES DALLI
DALL PORPOISE
PHYSETER CATODON
SPERM WHALE
STENELLA COERULEODALBA
STRIPED DOLPHIN/GRAY'S PORPOISE
ZIPEUS CAVIROSTRIS
CUVIER'S OR GOOSE BEAKED WHALE
TROPHIC LEVEL: (5) OMNIVORE
INVERTEBRATES
BENTHEOPAUSIA AMBLYOPS
EUPHAIUSIA PACIFICA
EUPHAIUSID
EUPHAIUSIA BOREALIS
EUPHAIUSID
EUPHAIUSIA LONGIPES
EUPHAIUSID
EUPHAIUSIA PARVA
EUPHAIUSID
EUPHAIUSIA RASCHII
EUPHAIUSID
EUPHAIUSIA SPINIFERA EUPHAIUSID
THYSANOPODA ACUITRONIS
EUPHAIUSID
THYSANOPODA CORNUA
EUPHAIUSID
THYSANOPODA EGREGIA
EUPHAIUSID
TROPHIC LEVEL: (5) OMNIVORE
FISHES
SARDINOPS SAGAX
PACIFIC SARDINE
TROPHIC LEVEL: (6) PARASITE
FISHES
ENTOSPHEUS TRIDENTATUS
PACIFIC LAMPREY
LAMPERA AYREST
RIVER LAMPREY
TROPHIC LEVEL: (7) FILTER FEEDER
INVERTEBRATES
OLIOLOM
SALP
HELIOCALPA VIRGULA
SALP
IASIS ZONARIA
SALP
OIKOPLEURA
LARVACEAN
PEGEA CONFODERATA
SALP
SALPA FUSIFORMIS
SALP
THALIA DEMOCRATICA
SALP
THEYS VAGINA
SALP
TROPHIC LEVEL: (9) INVERTEBRATE
EATER - INVERTEBRATES
ACANTHEPHRA CURTIROSTRIS
SHRIMP
BENTHEGENNHEA
SHRIMP
BENTHEGENNHEA BOREALIS
SHRIMP
CYSTISOMA FABRICII
AMPHIPOD
DAIRELLA CALIFORNICA
AMPHIPOD
EUROHOMIA BATHYPELAGICA
ARROW-WORM
EUROHOMIA FOWLERI
ARROW-WORM
EUROHOMIA HAMATA
ARROW-WORM
GENNADAS INCERTUS
SHRIMP
GENNADAS PROPINQUUS
SHRIMP
HYMENODORA FRONTALIS
SHRIMP
HYMENODORA GLACIALIS
SHRIMP
HYMENODORA GRACILIS
SHRIMP
HYMENODORA HYSTRIX
AMPHIPOD
HYPEROECHUS DEDUSARUM
AMPHIPOD
LANCEOLA LOVEND
AMPHIPOD
LYCAEA PULEX
AMPHIPOD
MENINGODORA MOLLIS
SHRIMP
NINOE GEMMA
POLYCHAETE WORM
NOTOSTOMUS JAPONICUS
SHRIMP
OXYCEPHALUS CLAUSI
AMPHIPOD
PANDALUS JORDANI
OCEAN PINK SHRIMP
PARAPASIPHEAE CRISTATA
SHRIMP
PARAPASIPHEAE SUICATIFRONIS
SHRIMP
PARAPHRONINA CRASSIPES
AMPHIPOD
PARAPHRONINA CRACILIS
AMPHIPOD
PARATHERMISTO PACIFICA
AMPHIPOD
PASIPHAEA CHACEI
SHRIMP
PASIPHAEA MAGNA
SHRIMP
PASIPHAEA PACIFICA
AMPHIPOD
PETALODIUM SUSPIRIOSUM
SHRIMP
PHORMINA SEDENTARIA
AMPHIPOD
PHRONIMOPSIS SPINIFERA
AMPHIPOD
POEOTOUS HESERES
POLYCHAETE WORM
PRIMNO ABYSSALIS
AMPHIPOD
PRIMNO MACROPA
AMPHIPOD
RHYCHONEREELLA ANGELINI
POLYCHAETE WORM
SAGITTA BIERII
ARROW-WORM
SAGITTA DECIPiens
ARROW-WORM
SAGITTA ELEGANS
ARROW-WORM
SAGITTA EUMERITICA
ARROW-WORM
SAGITTA MACROCEPHALA
ARROW-WORM
SAGITTA MAJINA
ARROW-WORM
SAGITTA MINIA
Habitat: Disphotic Pelagic

Trophic Level: (1) PLANKTIVORE INVERTEBRATES

Trophic Level: (2) HERBIVORE INVERTEBRATES

Trophic Level: (3) CARNIVORE INVERTEBRATES

Trophic Level: (9) INVERTEBRATE EATER - FISHES

Trophic Level: (5) CARNIVORE FISHES
HABITAT: ROCKY NON-VEGETATED BENTHIC

RAJA BINOCULATA
BIG SKATE
RAJA KINCAIDI
BLACK SKATE
RAJA RNIA
LONGNOSE SKATE
RAJA STELLULATA
STARRY SKATE
SCORPAENICHTHYS MARMORATUS
CABEZON
SEBASTES CAURINUS
COPPER ROCKFISH
SEBASTES MALIGER
QUILLBACK ROCKFISH
SEBASTES MYSTINUS
BLUE ROCKFISH
SEBASTES RUBRIRUMUS
YELLOWeye ROCKFISH
SEBASTODES MELANOPS
BLACK SEABASS
SONNIOSUS PACIFICUS
PACIFIC SLEEPER SNARK
SOUALUS ACANTHIAS
SPINY DOGFISH
TROPHIC LEVEL: (3) CARNIVORE
MAMMALS
EUMETOPIAS JUBATUS
NORTHERN OR STELLAR SEA LION
KOGIA BREVICEPS
PYGMY SPERM WHALE
MESOPLOON STEJNEGERI
STEJNEGER’S BEAKED WHALE
PHOCA VITULINA
HARBOR SEAL
PHOCOENA PHOCENA
HARBOR PORPOISE
PHYSETER CATodon
SPERM WHALE
ZALOPUS CALIFORNIANUS
CALIFORNIA SEA LION
ZIPEHUS CAVIROSTRIS
CUVIER’S OR GOOSE BEAKED WHALE
TROPHIC LEVEL: (4) DETRITIVORE
INVERTEBRATES
ALLOCENTROTUS FRAGILIS
SEA URCHIN
BANKIA SETACEA
TEREDO
BRISASTER LATIFRONS
SEA URCHIN
PENTAMERA PSEUDOCALCIGERA
SEA CUCUMBER
STRONGYLOCENTROTUS ECHINOIDES
SEA URCHIN
XYLOPHAGA WASHINGTONA
WASHINGTON WOODEATER
TROPHIC LEVEL: (5) OMNIVORE
INVERTEBRATES
AMPHISSA VERSICOLOR
SNAIL
GORGONOCEPHALUS CARYI
BASKET STAR
OENOPOTA
SNAIL
ONCOSOECIA
BRYOZOAN
PSEUDARCHASTER PARELLI ALASCEN
SEA STAR
TROPHIC LEVEL: (6) PARASITE
FISHES
ENTOSPHENUS TRIDENTATUS
PACIFIC LAMPEY
LAMPERTA AYRESI
RIVER LAMPEY
TROPHIC LEVEL: (7) FILTER FEEDER
INVERTEBRATES
ACILIA CASTRENSIS
DIVARICATE NUT CLAM
BALANUS CRENATUS
BARNACLE
BALANUS HESPERIOUS
BARNACLE
SEGULA FLABELLATA
BRYOZOAN
CABEREA ELLISI
BRYOZOAN
CALLAPORA CORNICULIFER A
BRYOZOAN
CARDIOMYA OLDROYDI
CUSPIDARIA CLAM
CELLARIA DIFFUSA
BRYOZOAN
CELLARIA MANDIBULATA
BRYOZOAN
CHLAMYs HASTATUS HERICIUS
PACIFIC PEAR SCALLOP
CHLAMYs HINDI
HIND’S SCALLOP
CLINOCARDIUM NUTALLI
BASKET COCKLE
HALOCYNTHIA IGABOJA
SEA SQUIRT
LAGENIPORA PUNCTULATA
BRYOZOAN
LAQUEUS CALIFORNIUS
LAMP SHELL
MYRIOZOM COARCTATUM
BRYOZOAN
MYRIOZOM TENUE
BRYOZOAN
MEMOCARDIUM CENTRIFILOSUM
HUNDRED-LINED COCKLE
PECTEN CAURINUS
GIANT PACIFIC SCALLOP
PROTOTHACA STAMINEA
ROCK COCKLE
SCALPELLUM
BARNACLE
SOLEMYA AGASSIZI
AWNING CLAM
TEREBRATULATA TRANSVERS A
LAMP SHELL
VENERICARIA VENTRICOSA
STOUT CARDITA CLAM
YOLDIA LINATULA GARDERI
FILE YOLDIA CLAM
TROPHIC LEVEL: (8) SCAVENGER
INVERTEBRATES
CANCER MAGISTER
DUNGENESS CRAB
PAGURISTES TURIDUS
HERMIT CRAB
PAGURUS ALETICUS
HERMIT CRAB
PAGURUS OCHOTENIS
HERMIT CRAB
PAGURUS TANNERI
HERMIT CRAB
PHYLLOLITHOIDES PAPILLOSUS
PAPILLA CRAB
TROPHIC LEVEL: (9) INVERTEBRATE EATER - FISHES
ARCTONOE PULCHRA
POLYCHAETE
BANANOPHYLLA ELEGANS
STONY CORAL
CHORILLIA LONGIPES
SHRIMP
CRANGOM COMMUNIS
SHRIMP
CRANGOM FRANCISORUM
SHRIMP
DAIRELLA CALIFORNIACA
ANMIPHOID
ENIPO GRACILIS
POLYCHAETE
HAPLOSCHELUS ELOONGATUS
POLYCHAETE
MAGELONA PAPILLICORNIS
POLYCHAETE
MAGELONA PITEKAI
POLYCHAETE
NEPHTYS CILIATA
POLYCHAETE
NEPHTYS LONGOSETOSA
POLYCHAETE
PANDALUS DAHAE
DOCK SHRIMP
PANDALUS JORDANI
OCEAN PINK SHRIMP
PANDALUS PLATYCRUS
SPOT SHRIMP
PARAGORGIA ARBOREA
SOFT CORAL
PISTA CRIS TATA
POLYCHAETE
PISTA FIMBRIATA
POLYCHAETE
PRAXILELLA GRACILIS
POLYCHAETE
SPIRONTOCARIS LAMELLICORNIS
SHRIMP
SPIRONTOCARIS HOLMESI
SHRIMP
TROPHIC LEVEL: (9) INVERTEBRATE EATER - FISHES
AGONOPSIS EMME LANE
NORTHERN SPEARNOSE POACHER
CLUPEA HARENGUS PALLASI
PACIFIC HERRING
LEPIDOPSETTA BILINEATA
ROCK SOLE
LEPTOCOTTUS ARMATUS
PACIFIC STAGHORN SCULPIN
HABITAT: ROCKY NON-VEGETATED BENTHIC

RADULINUS ASPRELLUS
SLIM SCULPIN

TROPHIC LEVEL (-)
INVERTEBRATES

ANCISTROLEPSIS
SNAIL

TROPHIC LEVEL: (0)
INVERTEBRATES

COLUS HALIDONUS
SNAIL

TROPHIC LEVEL: (2) HERBIVORE
INVERTEBRATES

ACHAEA NITRA
DUNCECAP LIMPET

TROPHIC LEVEL: (2) HERBIVORE
FISHES

ASTEROTHECA PENTACANTHUS
BIGEYE POACHER

TROPHIC LEVEL: (3) CARNIVORE
INVERTEBRATES

ACHAEA LIMATULA
FILE LIMPET

TROPHIC LEVEL: (3) CARNIVORE
FISHES

ANTIPLANES ABARBAREA
SNAIL

THYROID:

ANTIPLANES PERVERSA
SNAIL

THYROID:

ANTIPLANES VINOSA
SNAIL

THYROID:

ASTROPECTIN ARMATUS
SAND STAR

THYROID:

BENTHOCTOPUS
OCTOPUS

THYROID:

BORETROPHUS STUARTI
SNAIL

THYROID:

BUCINUM STRIGILLATUM
SNAIL

THYROID:

CADULUS STEARNSII
TOOTH SHELL

THYROID:

CALLIOSTOMA ANNULATUM
SNAIL

THYROID:

CHIONECTES BAIRO
TANNER CRAB

THYROID:

CHIONECTES OPILOC
TANNER CRAB

THYROID:

CHIONECTES TANNERI
TANNER CRAB

THYROID:

COLUS ROSEUS
SNAIL

THYROID:

COLUS SERVINUS
SNAIL

THYROID:

CROSSASTER PAPOSUS
ROSE STAR

THYROID:

DENTALIUM
TOOTH SHELL

THYROID:

DERMASTERIAS IMBRICATA
LEATHER STAR

THYROID:

EPITONIUM INDIANUM
SNAIL

THYROID:

FUSITRITON OREGONENSIS
OREGON TRITON

THYROID:

HENRICIA LEVISCULA
BLOOD STAR

THYROID:

ISCHNOCHITON
CHITON

THYROID:

LEPIDAZOMA
CHITON

THYROID:

LEPIDAZOMA GOLICISI
CHITON

THYROID:

LEPTOCRITUS
CHITON

THYROID:

LISCHEIA CIDARIS
SNAIL

THYROID:

LUIDIA FOLIATA
SAND STAR

THYROID:

METRIDIUM FIRMARITUM
SEA ANEMONE

THYROID:

HITHELLA GOULDI
SNAIL

THYROID:

HASSARIUS FOSSATUS
SNAIL

THYROID:

HASSARIUS MENDICUS
SNAIL

THYROID:

HATIKA CLAUSE
SNAIL

THYROID:

HELEINEA LYRATA
SNAIL

THYROID:

OCYSTUS DOLFEINI
OCTOPUS

THYROID:

PISASTER BREVISPINOSUS
SAND-SPINED PISASTER

THYROID:

PISASTER GIGANTEUS
GALTSTAR

THYROID:

PISASTER OCHRACEOUS
PURPLE STAR

THYROID:

POLIICES LEWISII
MOOD SNAIL

THYROID:

POLIICES PALLIDUS
MOOD SNAIL

THYROID:

POLYCLUS
OCTOPUS

THYROID:

PTERASTER TESSELATUS AIGUATUS
SLIME STAR

THYROID:

PUNCTURELLA CUCULATA
LIMPET

THYROID:

PYCHODONIA HELIANTHOIDES
SUNFLOWER STAR

THYROID:

ROSSIA PACIFICA
SQUID

THYROID:

SOLASTER DAWSONI
MORNING SUN STAR

THYROID:

SOLASTER STIMPSONI
SUN STAR

THYROID:

STYLISTERIAL FORRERI
SEA STAR

THYROID:

TACHYRHYNCHUS LACTEOLUS
SNAIL

THYROID:

TACHYRHYNCHUS PRATOMUM
SNAIL

THYROID:

TENAISACANTHIA PENCILLATUS
SEA STAR

THYROID:

TROPHEON TRIPHERUS
SNAIL

THYROID:

TROPHIC LEVEL: (3) CARNIVORE
FISHES

THYROID:

ANOPLOPOMA FINNIA
SABLEFISH

THYROID:

ATHENEUSTES STOMIAS
TURBOT OR ARROWTOOTH FLOUNDER

THYROID:

BROSOMOPHYSIS MARGINATA
RED BROUTLA

THYROID:

CHITONOTUS PUGETENSIS
ROUGHBACK SCULPIN

THYROID:

CITARICHTHYS SONDIDUS
PACIFIC SANDAB

THYROID:

DASYCOTUS SETIGER
SPINYHEAD SCULPIN

THYROID:

DEGELLEPS GIGANTEA
GIANT WRYMOUTH
<table>
<thead>
<tr>
<th>HABITAT: MUDDY NON-VEGETATED BENTHIC</th>
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<tbody>
<tr>
<td><strong>EUPSETTA JORDANI</strong></td>
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<tr>
<td><strong>PETRALE SOLE</strong></td>
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<td><strong>EPTATRETES DEANI</strong></td>
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<td><strong>BLACK MAGFISH</strong></td>
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<td><strong>EPTATRETES STOUTI</strong></td>
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<td><strong>PACIFIC MAGFISH</strong></td>
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<td><strong>GADUS MACROCEPHALUS</strong></td>
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<td><strong>PACIFIC COD</strong></td>
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<td><strong>GTYCOPHAUS ZACHIRUS</strong></td>
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<td><strong>REX SOLE</strong></td>
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<td><strong>HEXAGRAMMOS DECAGRAMMUS</strong></td>
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<td><strong>KELP GREENLING</strong></td>
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<td><strong>HEXAGRAMMOS STELLERI</strong></td>
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<td><strong>WHITE SPOTTED GREENLING</strong></td>
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<td><strong>HEXANCHUS GRSEUS</strong></td>
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<td><strong>SIXGILL SHARK</strong></td>
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<td><strong>HIPPOGLOSSOID ES LASSODON</strong></td>
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<td><strong>FLATHEAD SOLE</strong></td>
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<td><strong>HIPPOGLOSSUS STENCLEPIS</strong></td>
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<td><strong>PACIFIC HALIBUT</strong></td>
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<td><strong>HYDROLAGUS COLLIE</strong></td>
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<td><strong>RATFISH</strong></td>
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<td><strong>ICELINUS FILAMENTOSUS</strong></td>
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<td><strong>THREADFIN SCULPIN</strong></td>
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<td><strong>ISOPSETTA ISOLEPIS</strong></td>
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<td><strong>BUTTER SOLE</strong></td>
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<td><strong>SLENDER SOLE</strong></td>
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<td><strong>DOVER SOLE</strong></td>
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<td><strong>OPHIODON LONGATUS</strong></td>
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<td><strong>LINGCOD</strong></td>
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<td><strong>PAROPHRYS VETULUS</strong></td>
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<td><strong>ENGLISH SOLE</strong></td>
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<td><strong>PLATICHYSIS STELLATUS</strong></td>
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<td><strong>STARRY FLounder</strong></td>
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<td><strong>PORICHYTHYS NOTATUS</strong></td>
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<td><strong>PLAINFIN MIDSHIPMEN</strong></td>
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<td><strong>PSETTICHTHYS MELANOSTICTUS</strong></td>
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<td><strong>SAND SOLE</strong></td>
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<td><strong>RAJA BINOCULATA</strong></td>
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<td><strong>BIG SKATE</strong></td>
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<td><strong>LONGNOSE SKATE</strong></td>
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<td><strong>SCORPAENICHTHYS MARMORATUS</strong></td>
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<td><strong>CEBEZON</strong></td>
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<td><strong>SEBASTES CAURINUS</strong></td>
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<td><strong>COPPER ROCKFISH</strong></td>
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<td><strong>SOMNIOUS PACIFICUS</strong></td>
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<td><strong>PACIFIC SLEEPER SHARK</strong></td>
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<td><strong>SQUALLUS ACANTHIS</strong></td>
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<td><strong>SPINY DOGFISH</strong></td>
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<td><strong>TORPEDO CALIFORNICA</strong></td>
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<td><strong>PACIFIC ELECTRIC RAY</strong></td>
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<td><strong>TROPHIC LEVEL: (3) CARNIVORE</strong></td>
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<tr>
<td><strong>MAMMALS</strong></td>
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<tr>
<td><strong>EUMETOPIAS JUBATUS</strong></td>
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<td><strong>NORTHERN OR STELLAR SEA LION</strong></td>
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<td><strong>ESORIA BREVICEPS</strong></td>
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<td><strong>PTOERY SPERM WHALE</strong></td>
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<td><strong>PHOCA VITULINA</strong></td>
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<td><strong>HARBOR SEAL</strong></td>
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<td><strong>PHOCENA PHOCENA</strong></td>
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<td><strong>HARBOR PORPOISE</strong></td>
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<td><strong>SPERM WHALE</strong></td>
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<td><strong>ZALOPHUS CALIFORNIANUS</strong></td>
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<td><strong>CALIFORNIA SEA LION</strong></td>
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<td><strong>TROPHIC LEVEL: (4) DETRITIVORE</strong></td>
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<td><strong>INVERTEBRATES</strong></td>
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<td><strong>ALLOCENTROTUS FRAGILIS</strong></td>
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<td><strong>SEA URCHIN</strong></td>
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<td><strong>AMPHIOPLUS STRONGYLOPLAX</strong></td>
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<td><strong>BRIGHT STAR</strong></td>
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<tr>
<td><strong>APHUARA SARSII</strong></td>
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<td><strong>BANKIA SETACEA</strong></td>
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<td><strong>TEREDO</strong></td>
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<td><strong>BRISASTER LATIFRONS</strong></td>
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<td><strong>SEA CUCUMBER</strong></td>
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<td><strong>LISTRIOLOBUS HEXAMYTOSUS</strong></td>
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<td><strong>LOPHOLITHOIDES FORANIHATUS</strong></td>
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<td><strong>BOX CRAB</strong></td>
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<td><strong>LOPHOLITHOIDES MANDTII</strong></td>
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<td><strong>PUGET SOUND KING CRAB</strong></td>
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<td><strong>LUMBRINERIS BICIRRATA</strong></td>
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<td><strong>OPHIOPHOLIS BAKERI</strong></td>
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<td><strong>OPHIURA LUTKENI</strong></td>
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<tr>
<td><strong>PARAACHIUS CALIFORNICUS</strong></td>
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<td><strong>GIANT RED SEA CUCUMBER</strong></td>
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<td><strong>PENTAMER PSEUDOCALCIGERA</strong></td>
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<td><strong>SEA CUCUMBER</strong></td>
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<tr>
<td><strong>TELLINA BUTTONI</strong></td>
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<tr>
<td><strong>BUTTON'S TELLIN CLAM</strong></td>
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<td><strong>XYLOPHAGA WASHINGTONI</strong></td>
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<tr>
<td><strong>WASHINGTON WOODCAVER</strong></td>
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<td><strong>TROPHIC LEVEL: (5) OMNIVORE</strong></td>
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<tr>
<td><strong>INVERTEBRATES</strong></td>
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<td><strong>AMPHISSA VERSICOLOR</strong></td>
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<td><strong>SNAIL</strong></td>
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<td><strong>GORDONOCHEPHALUS CARYI</strong></td>
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<td><strong>BASKET STAR</strong></td>
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<td><strong>OENOPOTA</strong></td>
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<td><strong>SNAIL</strong></td>
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<td><strong>PSEUDARCHON PARELI ALASCEN</strong></td>
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<td><strong>SEA STAR</strong></td>
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<tr>
<td><strong>TROPHIC LEVEL: (6) PARASITE</strong></td>
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<tr>
<td><strong>FISHES</strong></td>
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<tr>
<td><strong>ENTOSPHENUS TRIDENTATUS</strong></td>
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<td><strong>PACIFIC LAMPIRE</strong></td>
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<td><strong>LAMPIRE AYRESI</strong></td>
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<td>Paguristes turgidus</td>
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<td>Pagurus aleuticus</td>
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<tr>
<td>Hermit crab</td>
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<td>Pagurus ochotensis</td>
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<tr>
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<td>Pagurus Tanneri</td>
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**Trophic Level:** (9) Invertebrate Eater - Invertebrates

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<td>Crangon francisorum</td>
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**Trophic Level:** (9) Invertebrate Eater - Fishes

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<td>Lumpenus sagitta</td>
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<td>Microgadus proximus</td>
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<td>Psychrolutes paradoxus</td>
<td>Tadpole sculpin</td>
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<td>Radulinus asperrulus</td>
<td>Slime sculpin</td>
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<tr>
<td>Xenerotus latifrons</td>
<td>Blacktip poacher</td>
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**Trophic Level:** (9) Invertebrate Eater - Invertebrates

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**Trophic Level:** (9) Invertebrate Eater - Invertebrates

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<td>Aglaophenia</td>
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<td>Campanularia</td>
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<td>Halecium corrugatum</td>
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<tr>
<td>Hippasteria spinosa</td>
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<td>Lapea fruticosa</td>
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<td>Mediaster aequalis</td>
<td>Vermillion star</td>
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HABITAT: MUD NON-VEGETATED BENTHIC

TROPHIC LEVEL: (2) HERBIVORE
INVERTEBRATES

ACMAEA MITRA
DUNCECAP LIMPET

TROPHIC LEVEL: (2) HERBIVORE
FISHES

ASTEROTHECA PENTACANTHUS
BIGHETE POACHER

TROPHIC LEVEL: (3) CARNIVORE
INVERTEBRATES

ACMAEA LIMITULA
FILE LIMPET
ANTIPLANES ABARABAREA
SNAIL
ANTIPLANES PERVERSA
SNAIL
ANTIPLANES VINOSA
SNAIL
ASTROPECTIN ARMATUS
SAND STAR
BENTHOCTOPUS
OCTOPUS
BORETOPHON STUARTI
SNAIL
BUCCINUM STRIGILLATUM
SNAIL
CADULUS STEARNSII
TOOTH SHELL
CALLIOSTOMA ANNULATUM
SNAIL
CHIONECTES BAIROI
TANNER CRAB
CHIONECTES OPILIO
TANNER CRAB
CHIONECTES TANNERI
TANNER CRAB
COLUS ROSEUS
SNAIL
COLUS SERVINUS
SNAIL
CROSSASTER PAPOSUS
ROSE STAR
DENTALIUM
TOOTH SHELL
DERMASTERIAS IMBRICATA
LEATHER STAR
EPITONIUM INDIANORUM
SNAIL
FUSITRITON OREGOMENSIS
OREGON TRITON
HENRICIA LEVISULA
BLOOD STAR
ISCHNOCHITON
CHITON
LEPIDAZOA
CHITON
LEPIDAZOA GOSCHI
CHITON
LEPTICHITON
CHITON
HABITAT: MUDDY SAND NON-VEGETATED BENTHIC

LISCHKEIA CIDARIS
SNAIL
LUDIA FOLIATA
SAND STAR
METRIDIUM FIMBRIATUM
SEA ANEMONE
METRELLA GOULDI
SNAIL
NASSARIUS FOSSATUS
SNAIL
NASSARIUS MENDICUS
SNAIL
MATICA CLUSA
SNAIL
NEPTUNEA LYRATA
SNAIL
OCTOPUS DOLPENI
OCTOPUS
PISASTER BREVISPINOUS
SHORT-SPINED PISASTER
GIANT STAR
PISASTER OCHRACEOUS
PURPLE STAR
POLINICES LEWISII
MOON SNAIL
POLINICES PALLIDUS
MOON SNAIL
POLYPUS
OCTOPUS
PTERASTER TESSELLATUS ARCUATUS
SLIME STAR
PUNCTURELLA CUCULATA
LIMPET
PYCNOPODIA HELIANTHODES
SUNFLOWER STAR
ROSSIA PACIFICA
SQUID
SOLASTER DAUSONI
MORNING SUN STAR
SOLASTER STIMPSONI
SUN STAR
STYLASTERIAL FORERI
SEA STAR
TACHYRHYNCHUS LACTEOLUM
SNAIL
TACHYRHYNCHUS PRATOMUN
SNAIL
THRISACANTHIAS PENCILATUS
SEA STAR
TRITONIA
NUIDBRANCH
TROPHON TRIPHERUS
SNAIL
TROPHIC LEVEL: (3) CARNIVORE
FISHES
AGENEN Pentaceros
WHITE STurgeon
ATHERINODES STOMIAS
TURBOT OR ARROWTOOTH FLounder
CHITONOTUS PUGETENSIS
ROUGHBACK SCUPIN
CITRICHITHYS SORDIDUS
PACIFIC SANDDAB
CITRICHITHYS STIGMAEUS
SPECKLED SANDDAB
DASYCOTTUS SETIGER
SPINYHEAD SCUPIN
DELOLEPIS GIANTEA
GIANT LIMPET
EODIPSETTA JORDANI
PETRALE SOLE
EPATRETSUS DEANII
BLACK HAGFISH
EPATRETSUS STOUTIN
PACIFIC HAGFISH
EUGADUS MACROCEPHALUS
PACIFIC COD
GLYPTOCEPHALUS ZACCHUS
REX SOLE
HEXAGRAMMOS DECAGRAMMUS
KELP GREENLING
HEXAGRAMMOS STELLERI
WHITESPOTTED GREENLING
HEXANCHUS GRISUS
SIXGILL SHARK
HIPPOGLOSSOIDES ELASSODON
FLATHEAD SOLE
HIPPOGLOSSU STECLESPI
PACIFIC HALIBUT
HYDROLAGUS COLLIEX
RATFISH
ICELINUS FILAMENTOSUS
THREADFIN SCUPIN
ISOPSETTA ISOLEPS
BUTTER SOLE
LYOPSETTA EXILIS
SLENDER SOLE
MICROSTOMUS PACIFICOUS
DOVER SOLE
OPHIODON ELONGATUS
LINGCOD
PAROPHYXIS VETULUS
ENGLISH SOLE
PLATICHYES STELLATUS
STARRY FLounder
PORICHTHYS NOTATUS
PLAINFIN MIDSHIPMEN
PSEUDOTITICHTHYS MELANOSTICTUS
SAND SOLE
RAJA BINOCULATA
BIG SKATE
RAJA KINCAIDII
BLACK SKATE
RAJA RHINOSTRONGIO
LONGNOSE SKATE
RAJA STELLULATUS
STARRY SKATE
SCORPAENICHTHYS MARMORATUS
SABEIZON
SEBASTES CALIFORNII
COPPER ROCKFISH
SENOGNIUS PACIFICOUS
PACIFIC SLEEPER SHARK
SQUALUS ACANTHUS
SPINY DOUFISH
TORPEDO CALIFORNICA
PACIFIC ELECTRIC RAY
TROPHIC LEVEL: (3) CARNIVORE
MAMMALS
EUMETOPIAS JUBATUS
NORTHERN OR STELLAR SEA LION
KOGIA BREVICIPS
PYGMY SPERM WHALE
PHOCA VITULINA
HARBOR SEAL
PHOCENA PHOCENA
HARBOUR PORPOISE
PHYSOSTOMUS CATODON
SPERM WHALE
ZALOSHUS CALIFORNIANUS
CAL FORNIA SEA LION
TROPHIC LEVEL: (4) DETRITIVOUS
INVERTEBRATES
ALLOENTROUS FRAGILIS
SEA URCHIN
AMPHI Oplane STRONGYLOPLAX
BRITTLE STAR
APHIDURA SARSII
BRITTLE STAR
BANK A SETACEA
TERIDOO
BRISPOTER LATIFRONOS
SEA URCHIN
DENDASTER EXCENTRICUS
SAND DOLLAR
LEPTIODHIA
SEA CUCUMBER
LISTIOLOBUS HEXAMYOTUS
ECHURID WORM
LOPHILOTHOIDE FORAMINATUS
BOX CRAB
LOPHILOTHOIDE MANDII
PUGIT SOUND KING CRAB
LUMBINEIRUS BICIRRATA
POLYCHAETE
LUMBINEIRUS SIHILABRIS
POLYCHAETE
MACHA ALACRANA
CHAFLY SMALL
MAGELONA JAPONICA
POLYCHAETE
KOLPIDIA INTERHEDIA
SEA CUCUMBER
OPHICHEROS BACERI
BRITTLE STAR
OPHINIRA LUTIEN
BRITTLE STAR
PARALTICHTHYS CALIFORNICA
GREAT RED SEA CUCUMBER
PENTHETERA PSEUDOCALCIGERA
SEA CUCUMBER
PENTHALA BUTTON
BUTTON'S TELLIN CLAM
XYLOHAGA WASHINGTONA
WASHINGTON WOOD EATER
TROPHIC LEVEL: (5) OMNIVORE
INVERTEBRATES
AMPHISSA VERSICOLOR
SNAIL
GORGONOCEPHALUS CARTI
BASET STAR
GONOPOTA
SNAIL
PSEUDARCHERTH PARELLII ASCEN
SEA STAR
TROPHIC LEVEL: (6) PARASITE
FISHES
ENTOPLHENUS TRIDENTATUS
PACIFIC LAMPREY
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<td>Pagurus tankeri HERMIT CRAB</td>
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HABITAT: MUDDY SAND NON-VEGETATED BENTHIC

HYDROID
LAFEOA FRUTICOSA
HYDROID
LAFEOA GRACILLIMA
HYDROID
MEDITASTER AEQUALIS
VERMILLION STAR
NEPTUNEA PРИBLOFFENSIS
SNAIL
PLUMULARIA ALICIA
HYDROID
RATHBUNASTER CALIFORNICUS
SEA STAR
SERTULARELLA TURGIDA
HYDROID
THUIARA ROBUSTA
HYDROID

TROPHIC LEVEL: (Q)

FISHES

PLEUROMICHTHYS COENOSUS
C-O SOLE
HABITAT: SAND NON-VEGETATED BENTHIC

TROPHIC LEVEL: (2) HERBIVORE
INVERTEBRATES

ACMAEA MITRA
DUNCECAP LIMPET

TROPHIC LEVEL: (2) HERBIVORE
FISHES

ASTEROTHECA PENTACANTHUS
BIG EYE POACHER

TROPHIC LEVEL: (3) CARNIVORE
INVERTEBRATES

ACMAEA LINATULA
FILE LIMPET
ANTIPLANES ABARBAREA
SNAIL
ANTIPLANES PERVERSA
SNAIL
ANTIPLANES VINOVA
SNAIL
ASTROPECTIN ARHATUS
SAND STAR
BENTHOCTOPUS
OCTOPUS
BORETROPHON STUARTI
SNAIL
BUCCINUM STRIGILLATUM
SNAIL
CADULUS STEARNSSI
TOOTH SHELL
CALLIOSTOMA ANNULATUM
SNAIL
CHIONECTES BIRDII
TANNER CRAB
CHIONECTES OPILO
TANNER CRAB
CHIONECTES TANNERI
TANNER CRAB
COLUS ROSEUS
SNAIL
COLUS SERVINUS
SNAIL
CROSSASTER PAPOSUS
ROSE STAR
DENTALIUM
TOOTH SHELL
DERMASTERS IMBRICATA
LEATHER STAR
EPITONIUM INDIANORUM
SNAIL
EVASTERIAS TROSCHELII
SEA STAR
FUSITRITION OREGONENSIS
OREGON TRITON
HENRICIA LEVISCUCA
BLOOD STAR
ISCHNOCHITON
CHITON
LEPIDAZONA
CHITON
LEPIDAZONA GOLISCHI
CHITON

TROPHIC LEVEL: (2) HERBIVORE
FISHES

ACPEPSER TRANSHEMATANUS
WHITE STURGEON
LISCHKEA CIDARIS
SNAIL
LUIDIA FOLIATA
SAND STAR
METRIDIUM FIMBRIATUM
SEA ANEMONE
MITRELLA GOLDSI
SNAIL
NASSARIUS FOSSATUS
SNAIL
NASSARIUS MENDICUS
SNAIL
NATICA CLAUEDA
SNAIL
NEPTUNEA LYRATA
SNAIL
OCTOPUS DOLFEINI
OCTOPUS
PISASTER BREVISPINOSUS
SHORT-SPIKED PISASTER
PISASTER GIGANTEUS
GIANT STAR
PISASTER OCHRACEUS
PURPLE STAR
POLINICES LEWISII
MOON SNAIL
POLINICES PALLIDUS
MOON SNAIL
POLYPUS
OCTOPUS
PTERASTER TESSELATUS ARCUATUS
SLIME STAR
PUNCTURELLA CUCULATA
LIMPET
PYCNOPODIA HELIANTHOIDES
SUNFLOWER STAR
Rossia Pacifica
SQUID
SOLASTER DAUSONI
MORNING SUN STAR
SOLASTER STIMPSONI
SUN STAR
STYLASTERIAL FORERI
SEA STAR
TACHYRHYNCHUS LACTEOLUM
SNAIL
TACHYRHYNCHUS PRATONUM
SNAIL
THR ISSACANTHIA PENCILATUS
SEA STAR
TROPHON TRIPHERUS
SNAIL

TROPHIC LEVEL: (3) CARNIVORE
FISHES

ACIPENSER TRANSHEMATANUS
WHITE STURGEON
BROS MOPHYCHUS MARGINATA
RED BROTULA
CHITONOTUS PUGETENSIS
ROUGHBACK SCUPPIN
CITRICHYTHYS SORDIDUS
PACIFIC SAND DAB
CITRICHYTHYS STIGMAEUS
SPECKLED SAND DAB
DASYATIS DIPTERURA
DIAMOND STINGRAY

DASYCATUS SETIGER
SPINYHEAD SCUPPIN
EOSETTA JORDANI
PETRALE SOLE
GADUS MACROCEPHALUS
PACIFIC COD
GLOTPHOPSIS ZACHIRUS
RED SOLE
HEXAGRAMMUS DECAGRAMMUS
KELP GREENLING
HEXAGRAMMUS STELLERI
WHITE SPOTTED GREENLING
HEXANCHUS GRISEUS
SIXGILL SHARK
HIPPOGLOSSIDAE ELSA DODON
FLATHEAD SOLE
HIPPOGLOSSUS STENICLEPIS
PACIFIC HALIBUT
HYDROLAGUS COLLEI
RATFISH
ICELINUS FILAMENTOSUS
THREADFIN SCUPPIN
ISOPSETTA ISOLEPIS
BUTTER SOLE
LYOPSETTA EXILIS
SLENDER SOLE
MICROSTOMUS PACIFICUS
DOVER SOLE
OPIDODON ELONGATUS
LINGCOD
PAROPHYS VETULUS
ENGLISH SOLE
PLATICHYTHYS STELLATUS
STARRY FLOUNDER
PORICHYTHYS NOTATUS
PLAINFIN MIDSHIPMEN
PSEUTICHYTHYS MELANOSTICTUS
SAND SOLE
RAJA BINOCULATA
BIG SKATE
RAJA KINCAIDI
BLACK SKATE
RAJA RHINA
LONGNOSE SKATE
RAJA STELLULATUS
STARRY SKATE
SCORPAENICHTHYS MARMORATUS
CABEZON
SOQUEUS ACANTHIA
SPINY DOGFISH
TORPEDO CALIFORNICA
PACIFIC ELECTRIC RAY
TRIAKIS SEMIFASCIATA
LEOPARD SHARK

TROPHIC LEVEL: (3) CARNIVORE
MAMMALS

EUMETOPIAS JUBATUS
NORTHERN OR STELLAR SEA LION
KOGIA BREVIPEPS
PYGMY SPERM WHALE
PHOCA VITULINA
HARBOR SEAL
PHOCODENA PHOCODENA
HARBOR PORPOISE
PHYSETER CADDEMI
SPERM WHALE
ZALOPHUS CALIFORNIANUS
CALIFORNIA SEA LION
Trophic Level: (4) Detritivore Invertebrates

- Allocentrotus fragilis
- Cuvier's Goose Beaked Whale
- Amphiopterus strongyloplax
- Brittle Star
- Aphiura sansii
- Brittle Star
- Bankia setacea
- Teredo
- Brisaster latifrons
- Bankia setacea
- Teredo
- Ophiura lutkeni
- Brittle Star
- Parastichopus californicus
- Giant Red Sea Cucumber
- Pentamera pseudocalcigera
- Sea Cucumber
- Strongylocentrotus echinoidea
- Sea Urchin
- Tellina buttoni
- Brittle Star
- Tellinidae
- Xylophaga washingtonia
- Washington Wood Eater

Trophic Level: (5) Omnivore Invertebrates

- Axinopsis sericata
- Clam
- Cardiomya oldroydi
- Cuspidaria clam
- Cardiomya planetica
- Clam
- Cardita stearnsii
- Clam
- Cardita venaticosa
- Clam
- Chlamys hastatus hercules
- Pacific Pear Scallop
- Chlamys hindsi
- Hinds' Clam
- Clinocardium nutalli
- Basket Cockle
- Compsomya subdiaphana
- Clam
- Cremerella columbianna
- Clam
- Euplexaura marki
- Sea Pen
- Huksleya munita
- Clam
- Liopectus quadrangularis
- Sea Pen
- Lyonsia striata
- Clam
- Nemocardium centrifilosum
- Hundred-Lined Cockle
- Nucula tenuis
- Clam
- Nuculana austini
- Clam
- Nuculana pernula
- Clam
- Patinopecten auratus
- Weathervane Scallop
- Pecten caurinus
- Giant Pacific Scallop
- Protophaca staminea
- Rock Cockle
- Psephidia lordi
- Clam
- Psolus squamatus
- Sea Cucumber
- Saxicava arctica
- Arctic Saxiclavine Clam
- Scleropincta
- Sea Pen
- Siliqua patula
- Pacific Razor Clam
- Siliqua sloati
- Sloat's Razor Clam
- Solemya agassizi
- Clam
- Stylosalpa elongata
- Sea Pen
- Thracia curta
- Clam
- Thracia trapezeoides
- Clam
- Thyasira barbarensis
- Clam
- Venericardia ventricosa
- Clam
- Stout Cardita clam
- Yoldia limatula gaimardi
- File Yoldia clam

Trophic Level: (6) Scavenger

- Acilia castrensis
- Divaricata Nut Clam

Trophic Level: (7) Parasite Fishes

- Lumpsna ayresii
- River Lamprey

Trophic Level: (8) Filter Feeder Invertebrates

- Acilia castrensis
- Divaricata Nut Clam

Trophic Level: (9) Invertebrate Eater - Invertebrates

- Apachta japonica
- Polycheate
- Arctonoe pulchra
- Polycheate
- Cariaria lactea
- Ribbed Worm
- Ceratulites californiensis
- Ribbed Worm
- Chorioidea longipes
- Snail
- Changia communis
- Snail
- Changia fransciolum
- Snail
- Eupho gracilis
- Polycheate
- Glycera americana
- Polycheate
- Heteropodium elongatum
- Polycheate
- Magelana papillicornis
- Polycheate
- Magelana pitekai
- Polycheate
- Nephtia coidoidea
- Polycheate
- Nephtia ciliata
- Polycheate
- Nephtia cornuta
- Polycheate
- Nephtia fereghineae
- Polycheate
- Nephtia longioseosa
- Polycheate
- Pandalus daniae
- Rock Shrimp
- Pandalus jordani
- Ciona: Pink Shrimp
- Pandalus platycephalus
- Sput Shrimp
- Pecta cristata
- Polycheate
- Pecta flabellata
- Polycheate
- Phoxia graciolis
- Polycheate
- Spiro tocarius lamblicornis
- Shrimp
- Spiro tocarius hongkongensis
- Shrimp
- Spiro tocarius hongkongensis
- Shrimp
- Georges Bank Eel
**HABITAT**: SAND NON-VEGETATED BENTHIC

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<th>Fishes</th>
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<td>Clupea harengus pallasi</td>
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**Trophic Level: (9) Invertebrates**

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**HABITAT:** SURFGRASS VEGETATED BENTIC

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<th>Carnivore Invertebrates</th>
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<th>Omnivore Invertebrates</th>
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- (5) Omnivore Invertebrates
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- Alaria marginata
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- Delesseria decipiens
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- Gastroclonium coulteri
- Gelidiun robustum
- Gigartina exasperata
- Gloiosiphonia verticillaris
- Gracilaropsis sjoestedii
- Grateloupia californica
- Gymnodogonius platyphylus
- Hymenella flabelligera
- Hymenella setchelli
- Iridaea cordata
- Red algae

**Invertebrates:**
- Acanthina mitra
- Dencecap limpet
- Strongylocentrus franciscanus
- Giant red urchin
- Strongylocentrus purpuratus
- Purple sea urchin
- Acanthina linulata
- File limpet
- Antiplanes perverso
- Snail
- Astropectin armatus
- Sand star
- Boreirophon stuarti
- Buccinum strigillatum
- Snail
- Calliodosta anulatum
- Snail
- Croseaster papillosus
- Rose star
- Dermasterias imbricata
- Leather star
- Lischkeia cadyi
- Snail
- Mitrella Gould
- Snail
- Nassarius fuscatus
- Snail
- Nassarius mendicus
- Snail
- Pisaster brevispinosus
- Short-spined urchin
- Pisaster giganteus
- Giant urchin
- Pisaster ochraceus
- Purple star
- Puncturella cuculata
- Limpet
- Pygopodia helianthoides
- Sunflower star
- Solaster stimpsoni
- Sun star
- Bankia setacea
- Terego
- Paratichopus californicus
- Giant red sea cucumber
- Xylophaga washingtoni
- Washington woodcutter
- Amphissa versicolor
- Snail
- Enoplosta
- Snail
- Oncoelea
- Bryozoan
- Bugula flabellata
- Bryozoan
- Cellaria mandiulata
- Bryozoan
- Clinks. nutilalis
- Basket cockle
- Lagena porosa punctulata
- Bryozoan
- Pecten aurinus
- Giant Pacific scallop
- Terebrotalia transversa
- Lami shell
- Tropic Level: (8) Scavenger
- Invertebrates
HABITAT: SURFGRASS VEGETATED BENTHIC

PHYLLOLITHOIDES PAPILLOSUS
PAPILLA CRAB

TROPHIC LEVEL: (0)
INVERTEBRATES

ABIETINARIA
HYDROID
ABIETINARIA ABIETINA
HYDROID
ABIETINARIA ALEXANDERI
HYDROID
ABIETINARIA TRASKI
HYDROID
ACRYPTOLARIA
HYDROID
AGLAOPHENIA
HYDROID
AGLAOPHENIA DIEGENSIS
HYDROID
AGLAOPHENIA INCONSPICUA
HYDROID
AGLAOPHENIA OCTOCARPA
HYDROID
CAMPANULARIA
HYDROID
CAMPANULARIA VERTICILLATA
HYDROID
CAMPANULARIA VOLUBILIS
HYDROID
HAELECIUM CORRUGATUM
HYDROID
LAFOEA ADNATA
HYDROID
LAFOEA DUMOSA
HYDROID
LAFOEA FRUTICOSA
HYDROID
LAFOEA GRACILLIMA
HYDROID
MEDIASTER AEOUALIS
HYDROID
VERMILLON STAR
PLUMULARIA ALICIA
HYDROID
SERTULARELLA TURGIDA
HYDROID
THUJARA ROBUSTA
HYDROID
HABITAT: SURFGRASS VEGETATED BENTHIC
| TROPHIC LEVEL: (1) PRODUCER     | PHOCA VITULINA                        | MOLCR CRAB                           |
| TROPHIC LEVEL: (1) PRODUCER     | HARBOR SEAL                           | SILIQUA PATULA                       |
| TROPHIC LEVEL: (1) PRODUCER     | SPILOGALE PUTORIUS                    | RAZOR CLAM                           |
| TROPHIC LEVEL: (1) PRODUCER     | ZALOPHUS CALIFORNIANUS                | TROPHIC LEVEL: (8) SCAVenger INVERTEBRATES |
| NON-VASCULAR PLANTS             | CALIFORNIA SEA LION                   | OLIVELLA BIPICATA                    |
| ASTRIOHELLA SOCIALIS            | TROPHIC LEVEL: (8) SCAVenger          | PURPLE OLIVE SNAIL                   |
| DIATOM                          | BIROS                                 | TROPHIC LEVEL: (9) INVERTEBRATE      |
| TROPHIC LEVEL: (1) PRODUCER     | ALLONISCUS PERCONVEXUS                | EATER - INVERTEBRATES               |
| VASCULAR PLANTS                 | ISOPODS                               | CEREBRATULUS                         |
| PHYLLOSPADIX SCOLIERI           | CALLIANASSA CALIFORNIIIS              | RIBBON WORM                          |
| SCOULER'S SURFGRASS             | GHOST SHRIMP                          | EOAUSTORIUS WASHINGTONIANUS         |
| TROPHIC LEVEL: (2) HERBIVORE    | CIROLANA KINCAIDI                     | AMPHIPOD                             |
| INVERTEBRATES                   | ISOPODS                               | PONTONALOTA OPACA                    |
| ENDEOSES COLLARIS               | COELOPA                               | ROVE BEETLE                          |
| COLEOPTERA                      | KELP FLY                              | STAPHYLINIDAE                        |
| TROPHIC LEVEL: (2) HERBIVORE    | EUZONUS MICRONATA                     | ROVE BEETLES                         |
| MAMMALS                         | BLOOD WORKS                           | THINOPUS PICTUS                      |
| TROPHIC LEVEL: (2) HERBIVORE    | ORCHESTOIDEA CALIFORNIANA             | ROVE BEETLE                          |
| INVERTEBRATES                   | SPINIDAE                              | THINUSA MARITIMA                     |
| ENDEOSES COLLARIS               | WORM                                  | ROVE BEETLE                          |
| TROPHIC LEVEL: (2) HERBIVORE    | TROPHIC LEVEL: (3) CARNIVORE          | TROPHIC LEVEL: (9) INVERTEBRATE      |
| INVERTEBRATES                   | CRAGO NIGRACAUDA                      | EATER - FISHES                       |
| TROPHIC LEVEL: (3) CARNIVORE    | BLACK-TAILED SHRIMP                   | ALLOSMERUS ELOCGATUS                 |
| INVERTEBRATES                   | CRAGO SPP.                            | WHITEBAIT SMELT                      |
| TROPHIC LEVEL: (3) CARNIVORE    | TROPHIC LEVEL: (5) OMNIVORE           | ANMYODTES HEXAPTERUS                |
| BIRDS                           | FISHERS                               | PACIFIC SAND LANCE                   |
| TROPHIC LEVEL: (3) CARNIVORE    | PHANERODON FURCATUS                   | AMPHISTICHUS RHODOTERUS              |
| MAMMALS                         | WHITE SEAPERCH                        | REDTAIL SURFPERCH                    |
| TROPHIC LEVEL: (3) CARNIVORE    | TROPHIC LEVEL: (5) OMNIVORE           | AMPHISTICHUS RHODOTERUS              |
| BIRDS                           | BIRDS                                 | HYPOMESUS PRETIOSUS                  |
| TROPHIC LEVEL: (3) CARNIVORE    | TROPHIC LEVEL: (5) OMNIVORE           | SURFSMELT                            |
| MAMMALS                         | MAMMALS                               | TROPHIC LEVEL: (9) INVERTEBRATE      |
| TROPHIC LEVEL: (3) CARNIVORE    | TROPHIC LEVEL: (5) OMNIVORE           | EATER - BIRDS                        |
| MAMMALS                         | MAMMALS                               | ARENARIA INTERPRES                   |
| TROPHIC LEVEL: (3) CARNIVORE    | TROPHIC LEVEL: (6) PARASITE           | RUDY TURNSTONE                       |
| MAMMALS                         | INVERTEBRATES                         | CALIDRIS ALBA                        |
| TROPHIC LEVEL: (3) CARNIVORE    | ALEOCHARA ARENARIA                    | SANDERLING                           |
| MAMMALS                         | ROVE BEETLE                           | CALIDRIS ALPINA                      |
| TROPHIC LEVEL: (3) CARNIVORE    | ALLODSMERUS ELOCGATUS                 | DUNLIN                                |
| MAMMALS                         | ROVE BEETLE                           | CALIDRIS BAIRDII                     |
| TROPHIC LEVEL: (3) CARNIVORE    | MALACORBELLA SPP.                    | BAIRD'S SANDPIPER                    |
| MAMMALS                         | RIBBON WORM                           | CALIDRIS CANTUS                      |
| TROPHIC LEVEL: (3) CARNIVORE    | TROPHIC LEVEL: (7) FILTER FEEDER      | RED KNOT                              |
| MAMMALS                         | INVERTEBRATES                         | CALIDRIS MAURI                        |
| TROPHIC LEVEL: (3) CARNIVORE    | ALEOCHARA ARENARIA                    | WESTERN SANDPIPER                    |
| MAMMALS                         | ROVE BEETLE                           | CHARADRIUS ALEXANDRINUS             |
| TROPHIC LEVEL: (3) CARNIVORE    | ROVE BEETLE                           | SNOWY PLOVER                         |
| MAMMALS                         | ROVE BEETLE                           | CHARADRIUS SEMIPALMATUS             |
| TROPHIC LEVEL: (3) CARNIVORE    | ROVE BEETLE                           | SENIPALMATED PLOVER                  |
| MAMMALS                         | ROVE BEETLE                           | LIMNOIDRUS GRISEUS                   |
| TROPHIC LEVEL: (3) CARNIVORE    | ROVE BEETLE                           | SHORT-BILLED DOMITCHER               |
| MAMMALS                         | ROVE BEETLE                           | LIMOSA FEDOA                         |
| TROPHIC LEVEL: (3) CARNIVORE    | ROVE BEETLE                           | MARBLED GODWIT                      |
HABITAT: UNPROTECTED BEACH SURF

NUMENIUS PHAEOPUS
WHIMBREL
PLUVIALIS SQUATAROLA
BLACK-BELLIED PLOVER

TROPHIC LEVEL: (Q) UNKNOWN
INVERTEBRATES

HAUSTORIIDAE
AMPHIPOD
**HABITAT: PROTECTED BEACH SURF**

**TROPHIC LEVEL:** (1) PRODUCER

<table>
<thead>
<tr>
<th>VASCULAR PLANTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYLLOSPADIX SCOUleri</td>
</tr>
<tr>
<td>SCOUler'S SURFGRASS</td>
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<tr>
<td>PLANTAGO MARITIMA</td>
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<tr>
<td>SEASIDE PLANTAIN</td>
</tr>
<tr>
<td>TENACETUM DOUGLASII</td>
</tr>
<tr>
<td>DUNE TANSY</td>
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**TROPHIC LEVEL:** (2) HERBIVORE

<table>
<thead>
<tr>
<th>INVERTEBRATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>LUMBRINARIS ZONATA</td>
</tr>
<tr>
<td>WORM</td>
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**TROPHIC LEVEL:** (2) HERBIVORE

<table>
<thead>
<tr>
<th>BIRDS</th>
</tr>
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<tbody>
<tr>
<td>BRANTA BERNICLA</td>
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<td>BRANT</td>
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**TROPHIC LEVEL:** (2) HERBIVORE

<table>
<thead>
<tr>
<th>MMMALS</th>
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</thead>
<tbody>
<tr>
<td>ODOCOILEUS HEMIONUS COLUMBIANU</td>
</tr>
<tr>
<td>BLACK-TAILED DEER</td>
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**TROPHIC LEVEL:** (3) CARNIVORE

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>EUMETOPIAS JUBATA</td>
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<tr>
<td>STELTER'S SEA LION</td>
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<tr>
<td>LYNX RUFUS</td>
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<tr>
<td>MIROurNA ANGSTUROSTRIS</td>
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<tr>
<td>ELEPHANT SEAL</td>
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<tr>
<td>MUSTELA FRENATA</td>
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<td>LONG-TAILED WEASEL</td>
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<td>MUSTELA VISON</td>
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<td>MINK</td>
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<tr>
<td>PHOCA VITULINA</td>
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<td>HARBOR SEAL</td>
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<td>SPILOGALE PUTORius</td>
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<td>SPOTTED SKUNK</td>
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<tr>
<td>ZALOPHUS CALIFORNIANUS</td>
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<td>CALIFORNIA SEA LION</td>
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**TROPHIC LEVEL:** (4) DETRITIVORE

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<tr>
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<td>CALLIANASSA CALIFORNIENSIS</td>
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<tr>
<td>GHOST SHRIMP</td>
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<tr>
<td>CIROLANA KINCAIDI</td>
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<td>ISOPODS</td>
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<tr>
<td>EUZONUS MUCRONATA</td>
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<tr>
<td>ORCHESTIA TRASKIANA</td>
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<td>LESSER BEACH HOPPER ORCHESTOIDEA</td>
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<td>CALIFORNIAN</td>
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<td>SAND FLEE/GREAT BEACH HOPPER</td>
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<td>SPIONIDAE</td>
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<td>WORM</td>
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**TROPHIC LEVEL:** (5) OMNIVORE

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<tbody>
<tr>
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<td>BLACK-TAILED SHRIMP</td>
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<tr>
<td>CRAGO SPP.</td>
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**TROPHIC LEVEL:** (5) OMNIVORE

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<td>HYPERPROSOPOM ANGENTEUIM</td>
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<tr>
<td>WALLEYE SURFPERCH</td>
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<tr>
<td>HYPERPROSOPOM ELLIPTICUM</td>
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<td>SILVER SURFPERCH</td>
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**TROPHIC LEVEL:** (5) OMNIVORE

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<th>BIRDS</th>
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<tbody>
<tr>
<td>CORVUS BRACHYRHYNCHOS</td>
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<tr>
<td>COMMON CROW</td>
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**TROPHIC LEVEL:** (5) OMNIVORE

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<th>MMMALS</th>
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<tbody>
<tr>
<td>MEFITIS MEPHITIS</td>
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<tr>
<td>STRIPED SKUNK</td>
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<tr>
<td>PEROMYSCUS MANICULATUS</td>
</tr>
<tr>
<td>DEER MOUSE</td>
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<tr>
<td>PROCYON LOTOR</td>
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<tr>
<td>RACCOON</td>
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**TROPHIC LEVEL:** (6) PARASITE

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<tbody>
<tr>
<td>MALACOBELLA SPP.</td>
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<tr>
<td>RIBBOW WORM</td>
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**TROPHIC LEVEL:** (7) FILTER FEEDER

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<tr>
<td>ARCHAEOMYSTIS GREBNITZKII</td>
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<tr>
<td>MYSIS</td>
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<tr>
<td>EMERITA ANALOGA</td>
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<tr>
<td>MOLE CRAB</td>
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<td>SILUGIA PATULA</td>
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<td>RAZOR CLAM</td>
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**TROPHIC LEVEL:** (8) SCAVenger

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<tr>
<td>OLIVELLA BIPICLATA</td>
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<tr>
<td>PURPLE OLIVE SNAIL</td>
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**TROPHIC LEVEL:** (8) SCAVenger

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<tr>
<td>HALIAEETUS LEUCOCEPHALUS</td>
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<tr>
<td>BALD EAGLE</td>
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<tr>
<td>LARUS GLAUCESCENS</td>
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<tr>
<td>GLAUCOUS-WINGED GULL</td>
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<tr>
<td>LARUS OCCIDENTALIS</td>
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<tr>
<td>WESTERN GULL</td>
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**TROPHIC LEVEL:** (9) INVERTEBRATE EATER - INVERTEBRATES

<table>
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<tbody>
<tr>
<td>CEREBRATULUS</td>
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<tr>
<td>RIBBOW WORM</td>
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<tr>
<td>EUGAUSTORIUS WASHINGTONIANUS</td>
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<td>AMPHIPOD</td>
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<tr>
<td>PARANEHERTES PEREGRINA</td>
</tr>
<tr>
<td>NEMERTAN</td>
</tr>
<tr>
<td>STAPHYLINIDAE</td>
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<td>ROVE BEETLES</td>
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**TROPHIC LEVEL:** (9) INVERTEBRATE EATER - FISHES

<table>
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<tr>
<th>FISHES</th>
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<tbody>
<tr>
<td>ALOSMERUS ELONGATUS</td>
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<tr>
<td>WHITEBAIT SMELT</td>
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<tr>
<td>ALOSA SAPIIDISSIMA</td>
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<tr>
<td>AMERICAN SHAD</td>
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<tr>
<td>AMMODYTES HEXAPERTUS</td>
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<tr>
<td>PACIFIC SAND LANCE</td>
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<tr>
<td>AMPHISTICHUS RHODOTERUS</td>
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<tr>
<td>REDTAIL SURFPERCH</td>
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<tr>
<td>CLUPEA HARENGUS PALLASI</td>
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<tr>
<td>PACIFIC HERRING</td>
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<tr>
<td>CYMATOGASTER AGGREGATA</td>
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<tr>
<td>SHINER PERCH</td>
</tr>
<tr>
<td>HYPOMESUS PRETIOSUS</td>
</tr>
<tr>
<td>SURFSMELT</td>
</tr>
<tr>
<td>LEPTOCOTTUS ARMATUS</td>
</tr>
<tr>
<td>PACIFIC STAGHORN SCULPIN</td>
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</tbody>
</table>
HABITAT: PROTECTED BEACH SURF

MICROGADUS PROXIMUS
PACIFIC TOMCOD

TROPHIC LEVEL: (9) INVERTEBRATE EATER - BIRDS

ACTITIS MACULARIA
SPOTTED SANDPIPER
ARENARIA INTERPRES
RUDDY TURNSTONE
ARENARIA MELANOCEPHAL A
BLACK TURNSTONE
CALIDRIS ALBA
SANDERLING
CALIDRIS ALPINA
DUNLIN
CALIDRIS BAIRDI
BAIRD'S SANDPIPER
CALIDRIS CANUTUS
RED KNOT
CALIDRIS MAURI
WESTERN SANDPIPER
CALIDRIS MINITILLA
LEAST SANDPIPER
CHARADRIUS ALEXANDRINUS
SNOWY PLOVER
CHARADRIUS SEMIPALMATUS
SEMIPALMATED PLOVER
CHARADRIUS VOCIFERUS
KILLEDER
LINNODROMUS GRISEUS
SHORT-BILLED DOWITCHER
LINNODROMUS SCOLOPACEUS
LONG-BILLED DOWITCHER
LINOSA FEDOA
MARBELED GODWIT
LOBIPES LOBATUS
NORTHERN PHALAROPE
NUMENIUS AMERICANUS
LONG-BILLED CURLEW
NUMENIUS PHAEOPUS
WHIMBREL
PLUVIALIS DOMINICA
AMERICAN GOLDEN PLOVER
PLUVIALIS SQUATAROLA
BLACK-BELLED PLOVER
TRINGA MELANOCEPHAL A
GREATER YELLOWLEGS

TROPHIC LEVEL: (0) UNKNOWN INVERTEBRATES

HAUSTORIIDAE
AMPHIPOD
HABITAT: UNPROTECTED ROCKY SURF

TROPHIC LEVEL: (1) PRODUCER
NON-VASCULAR PLANTS
ALARIA NANA
BOSSEA MANZA
LEAF CORAL
BRYOPSIS CORTICULANS
SEA FERN
CALLIARTHRON MANZA
BEAD CORAL
CALLITHANNIOR PIKEANUM
BEAUTY BUSH
CLADOPHORA TRICHOTOMA
GREEN BALL
CODIUN FRAGILE
SEA STAGHORN
CODIUM SETCHELLII
SPONGY CUSHION
CORALLINA GRAECILIS
GRACEFUL CORAL
COSTARIA COSTATA
SEERSUCKER
CUMALOGIA ANDERSONII
CYMATHERE TRIPICATA
TRIPLE RIB
CYSTOSEIREA OSMUNDACEA
WOODY CHAIN BLADDER
EGREGIA MENZIESII
FEATHER BOA
ENDOCERIA NUMICATA
NAIL BRUSH
ENTEROMORPHA COMPRESSA
GREEN CONFETTI
ENTEROMORPHA INTESTINALIS
LINK CONFETTI
ENTEROMORPHA PLUMOSA
SILK CONFETTI
GREATELPURA PINNATA
POINTED LYNX
HALICYSTIS OVALIS
HEDOPHYLLUM SESSILE
SEA CABBAGE
MYNENEA PLABELLIGERA
VEINED FAN
IRIDOPHYCUS SPECIES
IRIDESCENT SEAeed
LAMINARIA ANDERSONII
SPLIT WHIP WRACK
LAMINARIA PLATYMERIS
SEA GIRDLE OR TANGLE
LAMINARIA SETCHELLII
LESSONIOPSIS LITTORALIS
LITHOTHAMNIIUM SPECIES
RED ROCK CRUST
MICROCLADIA BOREALIS
COARSE SEA LACE
PELVIOTISPS LIMITATA
PLEUROPYCHUS GARDNERI
SEA SPATULA

TROPHIC LEVEL: (2) HERBIVORE
INVERTEBRATES
ACHAEAE DIGITALIS
PHYLLOSPADIX SCULFERI

TROPHIC LEVEL: (3) CARNIVORE
FISHES

HAEMATOPOUS BACHMANNI
NEMITITA DEGLANDI
WHITE-WINGED SCOTER

TROPHIC LEVEL: (4) DETRITIVORE
INVERTEBRATES

TROPHIC LEVEL: (3) CARNIVORE
MAMMALS
**HABITAT:** UNPROTECTED ROCKY SURF

**Trophic Levels:**

1. **Carnivore (Mammals):**
   - Eudistylia Vancouveri
   - Sabellid
   - Idotea Schmitti
   - Isopod
   - Idotea Wosnesenskii
   - Olive green isopod
   - Ligia Pallasi
   - Rock louse
   - Sabellaria Cementarium
   - Worm

   **Trophic Level:** (5) Carnivore

2. **Parasite (Invertebrates):**
   - Procyon lotor
   - Raccoon

   **Trophic Level:** (6) Parasite

3. **Filter Feeder (Invertebrates):**
   - Fabia subquadrata
   - PEA CRAB
   - Heterosaccus Californicus

   **Trophic Level:** (7) Filter Feeder

4. **Scavenger (Birds):**
   - Larus glaucescens
   - Glaucous-winged gull
   - Larus occidentalis
   - Western gull

   **Trophic Level:** (8) Scavenger

5. **Invertebrate Eater - Invertebrates:**
   - Amphistichus rhodoterus
   - Redtail surfperch
   - Cymatogaster aggregata
   - Shiner perch
   - Actitis macularia
   - Spotted sandpiper
   - Aphriza virgata
   - Surfbird
   - Arenaria interpres
   - Ruddy turnstone
   - Arenaria melanocephala
   - Black turnstone
   - Calidris ptilocnemis
   - Rock sandpiper
   - Heteroscelus incanus
   - Wandering tattler
   - Numenius phaeopus
   - Whimbrel

   **Trophic Level:** (9) Invertebrate Eater - Invertebrates

6. **Invertebrate Eater - Invertebrates:**
   - Hapalogaster Cavicaluda
   - Crab

   **Trophic Level:** (9) Invertebrate Eater - Invertebrates

7. **Invertebrate Eater - Fishes:**
   - Amblospa borealis
   - Rove beetle
   - Cephalothorax linearis
   - Nemertean
   - Diaulota densissima
   - Rove beetle
   - Emplocystena gracile
   - Ribbon worm
   - Liparodcephalus cordicollis
   - Rove beetle
   - Micrura verrilli
   - Nemertean
   - Parameretes Peregrina
   - Nemertean
   - Thalassotrechus barbarae nigri
   - Ground beetle

   **Trophic Level:** (9) Invertebrate Eater - Fishes
HABITAT: PROTECTED ROCKY SURF

<table>
<thead>
<tr>
<th>TROPHIC LEVEL: (1) PRODUCER</th>
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<tbody>
<tr>
<td>NON-VASCULAR PLANTS</td>
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<td>BOSSEA MANZA</td>
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<td>BEAD CORAL</td>
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<td>CERAMITIUM CALIFORNICUM</td>
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<td>CERAMITIUM PACIFICUM</td>
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<td>POTTERY SEAWEED</td>
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<td>COILOOESME CALIFORNICA</td>
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<td>STICK BAG</td>
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<td>AMBLOPSUS BOREALIS</td>
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<td>TROPHIC LEVEL: (5) CONSUMER</td>
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<tr>
<td><strong>Fishes</strong></td>
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<td>Arctedius lateralis</td>
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<tr>
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<td>Rosy lip sculpin</td>
</tr>
<tr>
<td>Hemilepidotus hemilepidotus</td>
</tr>
<tr>
<td>Red Irish lord</td>
</tr>
<tr>
<td>Hemilepidotus spinosis</td>
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<tr>
<td>Brown Irish lord</td>
</tr>
<tr>
<td>Hexagrammos decagrammus</td>
</tr>
<tr>
<td>Kelp greenling</td>
</tr>
<tr>
<td>Hexagrammos lagocephalus</td>
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<td>Rock greenling</td>
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<tr>
<td>Great sculpin</td>
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<td>Raja stellulata</td>
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<td>Starry skate</td>
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<tr>
<td>Scorpaenichthys marmoratus</td>
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<tr>
<td>Cabezon</td>
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<tr>
<td>Sebastes melanops</td>
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<td>Black rockfish</td>
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<tr>
<td>Xiphister atropurpureus</td>
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<tr>
<td>Black prickback</td>
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<thead>
<tr>
<th>TROPHIC LEVEL: (3) CARNIVORE</th>
<th>TROPHIC LEVEL: (3) CARNIVORE</th>
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<tr>
<td><strong>Mammals</strong></td>
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<tr>
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<tr>
<td>Eumedias jubata</td>
<td>Eumedias jubata</td>
</tr>
<tr>
<td>Steller's sea lion</td>
<td>Steller's sea lion</td>
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<tr>
<td>Lutra canadensis</td>
<td>Lutra canadensis</td>
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<tr>
<td>River otter</td>
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<tr>
<td>Mirounga angustirostris</td>
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<td>Elephant seal</td>
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<tr>
<td>Mustela vison</td>
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<tr>
<td>Phoca vitulina</td>
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<tr>
<td>Harbor seal</td>
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<td>Zalophus californianus</td>
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<tr>
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<tr>
<th>TROPHIC LEVEL: (4) DETRIVORE</th>
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<tr>
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<tr>
<td>Amphitrite robusta</td>
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<tr>
<td>Polychaete worm</td>
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<tr>
<td>Cucumaria miniata</td>
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<tr>
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<td>Eudistylia polyomorpha</td>
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<tr>
<td>Idotea urotona</td>
<td>Idotea urotona</td>
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<tr>
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<tr>
<td>Ligia pallasi</td>
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<tr>
<td>Rock Louise</td>
<td>Rock Louise</td>
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<tr>
<td>Helita palmata</td>
<td>Helita palmata</td>
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<tr>
<td>Beach hopper</td>
<td>Beach hopper</td>
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<tr>
<td>Neopaguritrite robustus</td>
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<tr>
<td>Terebellid worm</td>
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<tr>
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<tr>
<td>Brittle star</td>
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<tr>
<td>Orchestia traskiana</td>
<td>Orchestia traskiana</td>
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<tr>
<td>Lesser beach hopper</td>
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<tr>
<td>Thelepus crispus</td>
<td>Thelepus crispus</td>
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<tr>
<td>Worm</td>
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<tr>
<td>Tigropus californicus</td>
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<td>Helita palmata</td>
<td>Helita palmata</td>
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<tr>
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<tr>
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<td>Thelepus crispus</td>
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<td>Worm</td>
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<tr>
<th>TROPHIC LEVEL: (7) FILTER FEEDER</th>
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<tr>
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<td>Hinnites giganteus</td>
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HABITAT: PROTECTED ROCKY SURF

PLOCAMIA KARYKINA
RED SPONGE
SERPULA VENICULARIS
WORM
SPIRORBIS
WORM
TEREBRALIA TRANSVERSA
BRACHIPOD
TRICELLARIA OCCIDENTALIS
BROZON
XESTOSPONGIA VANILLA
SPONGE

TROPHIC LEVEL: (8) SCAVENER
INVERTEBRATES

HEMIGRAPSUS NUDUS
PURPLE SHORE CRAB
PACHYCHELES RUDIS
PORCELAIN CRAB
PAGURUS GRANOSIMANUS
HERMIT CRAB
PAGURUS HEMPHILLI
HERMIT CRAB
PAGURUS SAMUELIS
HERMIT CRAB
PETROLISTHES CINCTIPES
PORCELAIN CRAB

TROPHIC LEVEL: (8) SCAVENER
BIRDS

HALIAEETUS LEUCOCEPHALUS
Bald Eagle
LARUS GLAUCESCENS
GLAUCOUS-WINGED GULL
LARUS OCCIDENTALIS
WESTERN GULL

TROPHIC LEVEL: (9) INVERTEBRATE
EATER - INVERTEBRATES

ALLORCHESTES ANGUSTUS
-NULL-
AMPHIPORUS BINACULATUS
RIBBON WORM
ANTHOPLEURA ELEGANTISSIMA
AGREGATED ANEMONE
ANTHOPLEURA XANTHOGRAMMICA
GIANT GREEN ANEMONE
CANCER ANTENNARIUS
CRAB
CANCER MAgISTER
DUNGINESS CRAB
CANCER PRODUCTUS
CRAB
CEPHALOTHRIX LINEARIS
NEMERTEAN
CERATOSTOMA
FOLIATUM MUREX
EMPLECTENOMA GRACILE
RIBBON WORM
EPIACTIS PROLIFERA
ANEMONE
GLYCERA AMERICANA
WORM
HALOSYDNA BREVISETOSA
SCALE WORM
HERMISSENDIA CRASSICORNIS
NUDIBRANCH

MICRURA VERRILLI
NEMERTEAN
PARANEMERETES PEGENRINA
NEMERTEAN
PHOXICHLIDIIUM FENORATUM
SEA SPIDER
SPIRONTOCARIS BREVIOSTRIS
BROKEN BACK SHRIMP
SPIRONTOCARIS CRISTATA
BROKEN BACK SHRIMP
SPIRONTOCARIS PALUDICOLA
BROKEN BACK SHRIMP
SPIRONTOCARIS PRIONATA
BROKEN BACK SHRIMP
TEALIA CRASSICORNIS
ANEMONE
THALASSOTRECHUS BARBARAE NIGRI
GROUND BEETLE

TROPHIC LEVEL: (9) INVERTEBRATE
EATER - FISHES

APODICHTYS FLAVIDUS
PENPOINT GUNNEL
CHIROLOPHIS NUGATOR
NOSSHEAD WAR-BONNET
CLINOCOTTUS ACUTICEPS
SHARPNOSE SCULPIN
CLINOCOTTUS EMBRYUN
CALICO SCULPIN
CLINOCOTTUS GLOBICEPS
MOSSHEAD SCULPIN
CYMATOGASTER AGGREGATA
SHINER PERCH
GOSIESOX MAEANDRICUS
NORTHERN CLINGFISH
PACIFIC STAGHORN SCULPIN
LIPARIS FLORAE
TIDEPPOOL SNAILFISH
OLIGOCOTTUS MACULUS
TIDEPPOOL SCULPIN
OLIGOCOTTUS SEDERI
FLUFFY SCULPIN
PHOLIS LAETA
CRESCENT GUNNEL
RHACOCOELUS VACCUS
PILE PERCH
SPIRINCHUS STARKSI
NIGHT SMELT
XERERPES FUCORUM
ROCKWEED GUNNEL

TROPHIC LEVEL: (9) INVERTEBRATE
EATER - BIRDS

ACTITIS MACULARIA
SPOTTED SANDPIPER
APHIRIZA VIRGATA
SURFBIRD
ARENARIAlA INTERPRES
RUDY TURNSTONE
ARENARIAlA MELANOCEPAHA
BLACK TURNSTONE
CALIDRIS ALPINA
DUNLIN
CALIDRIS PTLIOCHENIS
ROCK SANDPIPER
HETEROSCELUS INCANUM
WANDERING TATTTER
NUMENIUS PhAEOPUS

WHIMBREL
PLUVIALIS SQUATAROLA
BLACK-BELLIED PLOVER
TRINGA MELANOLEUCA
GREATER YELLOWLEGS

TROPHIC LEVEL: (9) UNKNOWN
INVERTEBRATES

ANAITIDES MEDIPAPILLATA
PADDLE WORM
ARABELLA IRICOLOR
WORM
ASTRAEA GIBBEROSA
SNAIL
CREPIDULA ADUNCA
HORNED SLIPPER SHELL
CRYPTOLITHODES SITCHENSIS
UMBRELLA-BACKED CRAB
DODECACERIA FISTULICOLA
CIRRACTULID WORM
HAPALOGASTER CAVICAUDA
CRAB
LEPTASTERIA HEXACTIS
SEASTAR
LEPTASTERIA PUSILLA
SEASTAR
MIMULUS FOLIATUS
CRAB
DEDIGMATHUS INERMI
CRAB
PATRIA MINIATA
SEA BAT
PLATYNEIS AGASSIZI
HEREID WORM
PODARKE PUGGETTENSIS
POLYCHAETE
PUGETTIA PRODUCTA
KELP CRAB
SCYRA ACUTIFRONS
MASKING CRAB
TEGULA FUNEERALIS
BLACK TURBAN SNAIL
TROPHIC LEVEL: (-)  
VASCULAR PLANTS  
ANTHOXANTHUN OR bitun  
SWEET VERNALGRASS  
HOLCUS LANATUS  
COMMON VELVET-GRASS  
TROPHIC LEVEL: (1) PRODUCER  
VASCULAR PLANTS  
AIRA PRAECOX  
LITTLE HAIRGRASS  
ALNUS RUBRA  
RED ALDER  
ANGELICA LUCIDA  
SEA-WATCH  
ARCTOSTAPHYLOS COLUMBIANA  
BRISTLY MANZINITA  
ARCTOSTAPHYLOS UVA-URSI  
KINNIKINIC  
ARNERIA NERITIMA  
THRIFT  
BACCHARIS PILULARIS  
CHAPARRAL BROOM  
BLECHNUN SPICANI  
DEER FERN  
CALANAGROSTIS NUTIC~ENSIS  
REEDGRASS  
CASTILLEJA LITORALIS  
PACIFIC PAINTBRUSH  
CEANOTHUS THYRSIFLORUS  
BLUE BLOSSOM  
CERASTIUN ARVENSE  
FIELD CHICORY  
CYTISUS SCOPARIUS  
SCOTCH BROOM  
DANTHONIA CALIFORNICA  
OATGRASS  
DESMCHAMPSIA CAESPITOSOA  
TUFTED HAIRGRASS  
DESMCHAMPSIA LONGIFLORA  
HAIRGRASS  
DIGITALIS PURPUREA  
FOXGLOVE  
EMPETRUM NIGRUM  
CROWBERRY  
ERIGERON GLAUCUS  
SEASIDE DOCK  
FESTUCA RUBRA  
RED FESCUE  
FRAGARIA CHILOENSI3  
COASTAL STRAWBERRY  
GALIUM NUTTALLI  
NUTTAL'S BEDSTRAW  
GAUTHIERIA SHALLOW  
SALAL  
GNAPHALIUN CHILENSE  
COTTON-BATTING PLANT  
GRINDELIA INTEGRIFOLIA VAR. NA  
PUGET SOUND GUMMEED  
HERACLEUM LANATUM  
COM-PARSNIP  
KOLOSDISCUS DISCOLOR  
OCEAN-SPRAY  
HYPHOCAERIS RADICATA  
GOSMORE  
LASTHENIA CHRYSTOSOMA  
LASTHENIA  
LASTHENIA MINOR VAR. MARITIMA  
HAIRY LASTHENIA  
LATHYRUS LITORALIS  
BEACH PEA-VINE  
LEONTodon NUDICHALIS  
BRISTLY HAWKBIT  
LILAEOPSIS OCCIDENTALIS  
LILAEOPSIS  
LONICERA INOVLUCRATA  
BLACK TWINBERRY  
LOTUS FORMOSISSIMUS  
DEERTWITCH, SEASIDE LOTUS  
LUPINUS ARBOREUS  
TREE LUPINE  
LUPINUS VARICOLOR  
TWO-COLOR LUPINE  
MICROSERIS BIGLI0VI  
COAST MICROSERIS  
MYRICA GALE  
SWEET GALE  
PINUS CONTORTA  
LODGEPOLE PINE, SHORE PINE  
PLANTAGO NAGETELLA  
TALL COAST PLANTAIN  
PLANTAGO LANCEOLATA  
BUCKHORN PLANTAIN  
POA PACHYPHOLIS  
SEALIFF BLUEGRASS  
POLYPODIUM GLYCRRHRIZA  
LICORICE FERN  
POLYSTICHUM MUNIUM  
SWORDFERN  
PSEUDOTSUGA MENZIESII  
DOUGLAS FIR  
PERIODIUM AQUILINUM  
WESTERN BRACKEN FERN  
RANUNCULUS FLAMMULA  
SMALL CREEPING BUTTERCUP  
RHANUS PURSHIANA  
CASCARA  
RHODODENDRON MACROPHYLLUM  
WESTERN RHODODENDRON  
RHUS DIVERISLOBA  
POISON OAK  
ROMANZOFFIA TRACTI  
TRAICY'S MISTHAI DEN  
RUBUS SPECTABILIS  
SALMONBERRY  
RUBUS URSINUS  
DOUGLASSERRY  
RUMEX MARITIMUS  
SEASIDE DOCK  
SAGINA CRASSICAULUS  
STICK-STEMMED PEARLMOY  
SALIX HOOKERIANA  
COASTWILLOW  
SEDUM LANCEOLATUM VAR. NESIOTI  
LANGE-LEAVED STONECROP  
SIDALCEA HIRTIPES  
HAIRY-STEMMED CHEEVER-MALLOW  
STACHYS RIGIDA  
HEDGE NETTHE  
TANACETUM DOUGLASII  
DUNE TANSY  
THUJA PLICATA  
WESTERN RED CEDAR  
ULEX EUROPAEUS  
GORS:  
VACCINIUM OVAITUM  
EVERGREEN HUCKLEBERRY  
VACCINIUM PARVIFOLIUM  
RED HUCKLEBERRY  
VERATRUM VIRIDE  
FALSE HELLEBORE  
TROPH C LEVEL: (2) HERBIVORE  
INVER EBRATES  
PARAC UNIO ALASKENSIS  
FIDIS:  
TROPH C LEVEL: (2) HERBIVORE  
BIRDS  
BONASA UNBELEUS  
RUFFED GROUSE  
CARDU~LIS PINUS  
PINE SISKIN  
CARDU~LIS TRISTIS  
AMERICAN GOLDFINCH  
CARPOCAUS MEXICANUS  
HOUSE FINCH  
CARPOCAUS PURPUREUS  
PURPLE FINCH  
COLUMBA FASCIATA  
BAND-TAILED PIGEON  
DENDRAGAPUS OBSCURUS  
BLUE GROUSE  
HESPERIPHONA VESPERTINA  
EVENING GROSBEAK  
JUNCO HYEMALIS  
DARK-EYED JUNCO  
LOPHORYX CALIFORNICUS  
CALIFORNIA GULL  
LOXIA CURVIOSTRA  
RED CROSSBILL  
MELOPS IZA MELODIA  
SONG SPARROW  
MELOTHIUS ATER  
BROWN-HEADED COWBIRD  
OREOTYRAX PICTUS  
MOUNTAIN QUEL  
PASSER:LLA LIICIA  
FOX SPARROW  
PHEUCTIUS MELANGELOPHALUS  
BLACK HEADED GROSBEAK  
PITUIPO ERYTHROPHALMUS  
RUFO-~IZED TOWHEE  
SEILASP IORUS RUFUS  
RUFOUS HUMMINGBIRD  
SPIZELLA PASSERINA  
CHIPPING SPARROW  
SIBERIA N. SPARROW  
ZENHAID MACOURA  
MORN NG DOVE  
ZONOTR ChI ATRICAPILLA  
GOLDEN-CROWNED SPARROW  
ZONOTR ChI LEUCOPHYRS  
WHITE CROWNED SPARROW  
TROPHIC LEVEL: (2) HERBIVORE  
MAMMALL  
MICROTIS LONGICAUDUS  
LONG-TAILED VOLE
HABITAT: HEADLANDS AND ROCKY ISLANDS

MICROTUS OREGONI
OREGON VOLE
THOMOMYS MONTICOLA
MOUNTAIN POCKET GOPHER

TROPHIC LEVEL: (3) CARNIVORE
HERPETOFAUNA

THAMNOPHIS ORDINOIDES
NORTHWESTERN GARTER SNAKE
THAMNOPHIS SIRTALIS
COMMON GARTER SNAKE

TROPHIC LEVEL: (-) BIRDS

PANDION HALIAETUS
OSPREY

TROPHIC LEVEL: (3) CARNIVORE
BIRDS

ACCCIPITER COOPERII
COOPER'S HAWK
ACCIIPITER STRIATUS
SHARP-SHINNED HAWK

AEGOLIUS ACADICUS
SAW-BILLED CII

ASIO OTUS
LONG-EARED OWL
Bubo virginianus
GREAT HORNED OWL
BUTEO JAMAICENSIS
RED-TAILED HAWK
CEPPHUS COLUNBA
PIGEON GUILLEMOT
CERORHINCA HONOCERATA
RHINOCEROS AUKLET
FALCO PEREGRINUS
PEREGRINE FALCON
GLAUCIDION GNOMA
PYGMY OWL
LUNDA CIRRHATA
TUFTED PUFFIN
OCEANOOROHA FURCATA
FORK-TAILED STORM PETREL
OCEANOOROHA LEUCORHOA
LEACH'S STORM PETREL
OTUS ASIO
SCREECH OWL
PHALOCRORAX AURITUS
DOUBLE-CRESTED CORMORANT
PHALOCRORAX PELAGICUS
PELAGIC CORMORANT
PHALOCRORAX PENICILLATUS
BRANDT'S CORMORANT
PYCHORANPHUS ALEUTICUS
CASSIN'S AUKLET
TYTO ALBA
BARN OWL
URIA AALGE
COMMON MURRE

TROPHIC LEVEL: (3) CARNIVORE
MAMMALS

CANIS LATRANS
COYOTE
FELIS CONCOLOR
MOUNTAIN LION

LYNX RUFUS
BOBCAT
MUSTELA ERMINEA
SHORT-TAILED WEASEL
SPILOCALE FUTORIUS
SPOTTED SKUNK
UROCYON CINERARGENTIUS
GRAY FOX
VULPES FULVA
RED FOX

TROPHIC LEVEL: (5) OMNIVORE
BIRDS

BOMBYCILLA CEDRORUM
CEDAR WAXWING
CORVUS BRACHYRHYNCHOS
COMMON CROW
CORVUS CORVAX
COMMON RAVEN
CYANOCITTA STELLERI
STELLER'S JAY
PERISSOREUS CANADENSIS
GRAY JAY
PIRANGA LUDOVICIACA
WESTERN TANAGER
STURNUS VULGARIS
STARLING
TURDUS MIGRATORIUS
AMERICAN ROBIN

TROPHIC LEVEL: (6) PARASITE
VASCULAR PLANTS

ANABOLUS BOREALIS
ROVE BEETLE
DIAULOTA DENSISSIMA
ROVE BEETLE
LIPAROCEPHALUS COROCOLLIS
ROVE BEETLE
THALASSOSTRECUS BARBARAE NIGRI
GROUND BEETLE

TROPHIC LEVEL: (9) INVERTEBRATE EATER - HERPETOFAUNA

AMBLYSTOMA GRACILE
BROWN SALAMANDER
BUFO XORAES
WESTERN TOAD

TROPHIC LEVEL: (9) INVERTEBRATE EATER - BIRDS

GERRHONOTUS COERULEUS
NORTHERN ALLIGATOR LIZARD
HYLA REGILLA
PACIFIC TREEFROG
PLETHODON DUNNI
DUNNS SALAMANDER
RYACOTRITON OLYMPICUS
OLYMPIC SALAMANDER
TARICHA GRANULOSA
ROUGH-SKINNED NEWT

TROPHIC LEVEL: (9) INVERTEBRATE EATER - MAMMALS

CATHARTES AUREUS
HERMIT THRUSH
CATHARUS USTULATUS
SWAINSON'S THRUSH
CERTHIA FAMILIARIS
BROWN CREEPER
CHAIURA VAUXI
VAUX'S SWIFT
CHLAMAEA FASCICATA
WREN
CHORDILES MINOR
COMMON NIGHTHAWK
COLAPTES AURATUS
COMMON FLICKER
CONTOPSIS SORIDULUS
WESTERN WOOD PEWEE
CYPSELOIDES NIGER
BLACK SWIFT
DENDROICA CORONATA
YELLOW-RUMPED WARBLER
DENDROICA NIGRIGENS
BLACK-THROATED GRAY WARBLER
DENDROICA OCCIDENTALIS
HERMIT WARBLER
DENDROICA PECTECHIA
YELLOW WARBLER
DENDROICA TOWNSENDII
TOWNSEND'S WARBLER
DROCOPTUS PILEATUS
PILEATED WOODPECKER
EMPIDONAX DIFFICILIS
WESTERN FLYCATCHER
EMPIDONAX HAMMONDI
HAMMOND'S FLYCATCHER
EMPIDONAX OBERHOLSERI
DUSKY FLYCATCHER
EMPIDONAX TRAILLII
WILLOW FLYCATCHER
HABITAT: HEADLANDS AND ROCKY ISLANDS

HIRUNDO RUSTICA
BARN SWALLOW

IRIDOPROCNE BICOLOR
TREE SWALLOW

IXOREUS NAEVIUS
VARED THRUSH

MYADESTES TOWNSENDI
TOWNSEND'S SOLITAIRE

NUTTALLORNIS BOREALIS
OLIVE-SIDED FLYCATCHER

OPORORNIS TOLMIEI
MCGILLIVRAY'S WARBLER

PARUS ATRICAPILLUS
BLACK-CAPPED CHICKADEE

PARUS RUFESCENS
CHESTNUT-BACKED CHICKADEE

PETROCCHIDON PYRRHONOTA
CLIFF SWALLOW

PICOIDES PUBESCENS
DOWNY WOODPECKER

PICOIDES VILLOSUS
HAIRY WOODPECKER

PROGNE SUBIS
PURPLE MARTIN

PSALTRIPARUS MINIMUS
BUSH TIT

REGULUS CALENDULA
RUBY-CROWNED KINGLET

REGULUS SATRAPA
GOLDEN-CROWNED KINGLET

SITTA CANADENSIS
RED-BREASTED NUTHATCH

SITTA CAROLINENSIS
WHITE-BREASTED NUTHATCH

SPHYRAPICUS VARIUS
YELLOW-BELLIED SAPSUCKER

STELGIOPTERYX RUFICOLLIS
ROUGH-WINGED SWALLOW

TACHycineta THALASSINA
VIOLET-GREEN SWALLOW

THRYOMANES BEWICKII
BEWICK'S WREN

TROGLODYTES AEDON
HOUSE WREN

TROGLODYTES TROGLODYTES
WINTER WREN

VERNIVORA CELATA
ORANGE-CROWNED WARBLER

VERNIVORA RUFICAPILLA
NASHVILLE WARBLER

VIREO GILVUS
WARBLING VIREO

VIREO HUTTONI
HUTTON'S VIREO

VIREO SOLITARIUS
SOLITARY VIREO

WILSONIA PUSILLA
WILSON'S WARBLER

TROPHIC LEVEL: (9) INVERTEBRATE EATER - MAMMALS

EPTESICUS FUSCUS
BIG BROWN BAT

NYOTIS LICIFUGUS
LITTLE BROWN MYOTIS

NEUROTICHIUS GIBBSII
SHREW-MOLE

SCAPANUS TOWNSENDII
TOWNSEND'S MOLE
HABITAT: HEADLANDS AND ROCKY ISLANDS

TROPHIC LEVEL: (1) PRODUCER
NON-VASCULAR PLANTS
ASTERIONELLA FORMOSA
DIATOM
ASTERIONELLA JAPONICA
DIATOM
ASTERIONELLA KARIANA
DIATOM
BACTERIASTRUM DELICATULUM
DIATOM
CERATIUM
DINOF Lagellate
CHAETOCEROS COMPRESSUS
DIATOM
CHAETOCEROS CONVOLUTUS
DIATOM
CHAETOCEROS RADICANS
DIATOM
COCCOLITHOPHORES
COCCOLITHS
DACTYLIOSOLEN MEDDITERRANEUS
DIATOM
FRAGILARIA
DIATOM
GONYaulax
DINOF Lagellate
LEPTOCYLINDRICUS DANICUS
DIATOM
MELOSIRA ISLANDICA
DIATOM
OTHER FLAGELLATES
FLAGELLATES
PERIDININIUM
DINOF Lagellate
RHIZOSolenia ALATA
DIATOM
RHIZOSolenia DELICATULA
DIATOM
RHIZOSolenia FRAGILISSIMA
DIATOM
SYNEDRA ULNA
DIATOM
THALASSIONEMA NITISOCHIOIDES
DIATOM

TROPHIC LEVEL: (2) HERBIVORE
INVERTEBRATES
ACARTIA CLAUSI
COPEPOD
ACARTIA DANA
COPEPOD
ACARTIA LONGIREMIS
COPEPOD
ACARTIA NEGILIGENS
COPEPOD
AETIDEOPSIS PACIFICA
COPEPOD
AETIDEUS ARMATUS
COPEPOD
AETIDEUS PACIFICUS
COPEPOD
AMALLOTHRIX VALIDA
COPEPOD
AMALLOTHRIX VORAK
COPEPOD
ARIETELLUS PLUMIFER
COPEPOD
BATHYCALANUS BRADYI
COPEPOD
BOREOMYSIS
COPEPOD
BOREOMYSIS ROSTRATA
COPEPOD
CALANUS CRISTATUS
COPEPOD
CALANUS FINMARCHICUS
COPEPOD
CALANUS PLUNCHRUS
COPEPOD
CALANUS TENUICORNIS
COPEPOD
CALOCALANUS STYLIREMIS
COPEPOD
CANDACIA BIPINNATA
COPEPOD
CAVOLINA UNCINATA
COPEPOD
CENTRAUGAPTILUS PORCELLUS
COPEPOD
CENTROPAGES MCMURRICH
COPEPOD
CHIRUNDINA STREETSI
COPEPOD
CLAUSOCALANUS ARCUICORNIS
COPEPOD
CLAUSOCALANUS PERGENS
COPEPOD
Clio BALANTHUM
COPEPOD
CLione LIMACINA
COPEPOD
COROLLA SPECTABILIS
COPEPOD
CORYCEUS
COPEPOD
CTENOCALANUS VANUS
COPEPOD
EPILABIDOCERA AMPHITRITES
COPEPOD
EUCALANUS ATTENUATUS
COPEPOD
EUCALANUS BUNGII
COPEPOD
EUCHAETA SPINOSA
COPEPOD
EUCHIRELLA CURTICAUDA
COPEPOD
EUCPIA
COPEPOD
EVADE NORMANNI
CLADOCERAN
GAETANUS SECUNDUS
COPEPOD
GAETANUS SIMPLEX
COPEPOD
GADUS BREVISPINUS
COPEPOD
GADUS VARIABILIS
COPEPOD
GAUSSIA PRINCEPS
COPEPOD
HABITAT: EUPHOTIC PELAGIC

GIGANTOCYPRIS AGASSIZII COPEPOD
OSTRACOD
GNATHOPHANUS GIGAS COPEPOD
GNATHOPHANUS INGENS COPEPOD
HALOPTILUS PSEUDOXYPEHALUS COPEPOD
HETERORHABDUS TANNERI COPEPOD
HETEROSTYLES LONGICORNIS COPEPOD
HETEROSTYLES MAJOR COPEPOD
LUCICUTIA BICORNUTA COPEPOD
LUCICUTIA FLAVICORNIS COPEPOD
METRIDEA LUCENS COPEPOD
METRIDA CURICAUDE COPEPOD
MICROCALANUS PYGMAEUS COPEPOD
MICROSETella COPEPOD
MIXTOCALANUS ROBUSTUS COPEPOD
OITONA COPEPOD
ONCAEA CONIFERA COPEPOD
PARACALANUS PARVUS COPEPOD
PAREUCHAETA BIROSTRATA COPEPOD
PAREUCHAETA JAPONICA COPEPOD
PHAEOOMMA SPINIFERA COPEPOD
PLEUROMANNA BOREALIS COPEPOD
PLEUROMANNA SUTULLATA COPEPOD
PODON LEUCKARTI CLADOCERAN
PSEUDOCALANUS MINUTUS COPEPOD
PSEUDOSCHIRELLA POLYPISIMA COPEPOD
RACOVITANUS FORRECTA COPEPOD
RACOVITANUS PACIFICA COPEPOD
RHINOCALANUS NASUTUS COPEPOD
SCAPHOCALANUS MEDIUS COPEPOD
SCAPHOCALANUS MINUTUS COPEPOD
SCAPHOCALANUS SUBELONGATUS COPEPOD
SCOELEThRACIELLA MINOR COPEPOD
SCOTOCALANUS SEDATUS COPEPOD
TORTANIS DISCAUDATUS COPEPOD
UNDEUCHAETA INTERMEDIA COPEPOD

UNDEUCHAETA MAJOR COPEPOD
UNDEUCHAETA PLUMOSA COPEPOD
TROPHIC LEVEL: (2) HERBIVORE BIRDS
BRANTA NIGRICANS BLACK BRANT
TROPHIC LEVEL: (3) CARNIVORE INVERTEBRATES
ABRALIOPSIS FELIS SQUID
AEGINA CITREA JELLYFISH
AEGINA GRIMALDII JELLYFISH
AEGUOREA JELLYFISH
AGLANTRA DIGITALE JELLYFISH
ATOLLA VAMHOEFFENI JELLYFISH
ATOLLA WYVELLEI JELLYFISH
AURELIA LABIATA JELLYFISH
BARGMANNIA JELLYFISH
BERGE CUCUMIS COMB JELLY
BOTRYNEMA BRUCEI JELLYFISH
CALYCOPSIS NEMATOPHORA JELLYFISH
CARANARIA JAPONICA HETEROPOD
CHELOPHYES APPENDICULATA JELLYFISH
CHELOPHYES MULTIDENTATA JELLYFISH
CHELOTEUTHIS VERANYI SQUID
CHUMPHYES MOSERAE JELLYFISH
COLOBONEMA SERVICEUM JELLYFISH
CRANCHA SCABRA SQUID
CROSSOTA ALBA JELLYFISH
CROSSOTA PEDUNCULATA JELLYFISH
CROSSOTA RUFOBRUNNEA JELLYFISH
CUNIMA OCTOMARIA JELLYFISH
CYANEA JELLYFISH
EUPHYSORA FURCATA JELLYFISH
EUTHONIA INDICANS JELLYFISH
GALITEUTHIS ARMATA SQUID
GONATOPSIS BOREALIS SQUID

GONATL S ANONYCHUS SQUID
GONATL S FABRICII SQUID
GONATL S MAGISTER SQUID
HALICHRUS MINIMUM JELLYFISH
HALISIURA CELLULARIA JELLYFISH
HISTITEUTHS HETEROPSIS SQUID
LEMSIA CONOIDEA JELLYFISH
LIMACINA HELACINA PTEROCOD
LOLIGA OPalescens SQUID
MOROTEUTHS ROBUSTA SQUID
MUGGIAEA ATLANTICA JELLYFISH
NAWOMA CARA JELLYFISH
OCTOPOTEUTHS SICULA SQUID
ONYCHOTEUTHS BANKSI SQUID
PANTACOGON HEAKELI JELLYFISH
PARAPRILLINA RANSONI JELLYFISH
PERIPHyllA PERIPHYLLA JELLYFISH
PHYSOPHORA HYDROSTATIC A JELLYFISH
PLEUROIRACHIA PILEUS COMB JELLY
PRAYA UBUA JELLYFISH
PRAYA JECUTALATA JELLYFISH
PTEROACHEA SUTUTA METERPOD
SAHSIA PRINCEPS JELLYISH
SAHSIA TUBULOSA JELLYISH
SOLMIIUS INCISA JELLYISH
SOLMIIUS MARSHALLI JELLYISH
SULCULIOARIA QUADRIVALVIS JELLYISH
TAOIUI PALVO SQUID
VAMPYRUTEUTHS IMPERNALIS SQUID
VELOLL VELELLA JELLYISH
VOGTA SPINOSA JELLYISH
TROPHIC LEVEL: (3) CARNIVORE FISHES
ALOPIA VULPIMUS THRESHER SHARK
BRACHYSTUS FRENATUS KELP EELCH
### HABITAT: EUPHOTIC PELAGIC

<table>
<thead>
<tr>
<th>Taxon Name</th>
<th>Common Name</th>
<th>Reference</th>
<th>Trophic Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eptatretus Deani</td>
<td>Black Hagfish</td>
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<tr>
<td>Eptatretus stouti</td>
<td>Pacific Hagfish</td>
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<tr>
<td>Gadus macrocephalus</td>
<td>Pacific Cod</td>
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<td>Galeorhinus zyopterus</td>
<td>Souffin Shark</td>
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<td>Hexanchus griseus</td>
<td>Bigeye Shark</td>
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<td>Hydrolagus collaris</td>
<td>Ratfish</td>
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<td>Lamna ditropis</td>
<td>Salmon Shark</td>
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<td>Merluccius productus</td>
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<td>Morone saxatilis</td>
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<td>Notorynchus maculatus</td>
<td>Ratfish</td>
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<td>Oncorhynchus gorbuscha</td>
<td>Pink Salmon</td>
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<tr>
<td>Oncorhynchus keta</td>
<td>Chinook Salmon</td>
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<td>Oncorhynchus kisutch</td>
<td>Coho Salmon</td>
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<tr>
<td>Oncorhynchus tshawytscha</td>
<td>Oncorhynchus keta</td>
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<tr>
<td>Chinook Salmon</td>
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<tr>
<td>Prionace glauca</td>
<td>Blue Shark</td>
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<td>Raja kincaidi</td>
<td>Black Skate</td>
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<td>Raja rhina</td>
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<td>Longnose Skate</td>
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<td>Raja stellulata</td>
<td>Star Skate</td>
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<td>Salmo clarki</td>
<td>Blue Salmon</td>
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<tr>
<td>Salmo gairdneri</td>
<td>Steelhead Trout</td>
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<tr>
<td>Salvelinus malma</td>
<td>Salmon</td>
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<tr>
<td>Dolly Varden</td>
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<tr>
<td>Sebastes alutus</td>
<td>Pacific Oceanperch</td>
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<tr>
<td>Sebastes crameri</td>
<td>Blackmouth Rockfish or Darkblood Seabass</td>
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<td>Sebastes diploproa</td>
<td>Splitnose Rockfish</td>
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<td>Sebastes flavidos</td>
<td>Yellowtail Rockfish</td>
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<td>Sebastes pinenger</td>
<td>Canary Rockfish</td>
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<td>Sebastolobus alascanus</td>
<td>Shortspine Rockfish</td>
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<td>Somniosus pacificus</td>
<td>Pacific Sleeper Shark</td>
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<td>Squallus acanthias</td>
<td>Spiny Dogfish</td>
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<tr>
<td>Theragra chalcogramma</td>
<td>Walleye Pollock</td>
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<tr>
<td>Torpedo californica</td>
<td>Pacific Electric Ray</td>
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<tr>
<td>Trachurus semifasciatus</td>
<td>Leopard Shark</td>
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#### BIRDS

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<thead>
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<th>Taxon Name</th>
<th>Common Name</th>
<th>Reference</th>
<th>Trophic Level</th>
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<tbody>
<tr>
<td>Cephus columba</td>
<td>Pigeon Guillemot</td>
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<tr>
<td>Podiceps auritus</td>
<td>Horned Grebe</td>
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<td>Podiceps grisegena</td>
<td>Red-Necked Grebe</td>
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<tr>
<td>Phalacrocorax alutus</td>
<td>Double-Crested Cormorant</td>
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<tr>
<td>Phalacrocorax pelagicus</td>
<td>Pelagic Cormorant</td>
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<tr>
<td>Phalacrocorax penicillatus</td>
<td>Brandt's Cormorant</td>
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<tr>
<td>Phalaropus fulicarius</td>
<td>Red Phalarope</td>
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<tr>
<td>Tyto alba</td>
<td>Barn Owl</td>
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#### MAMMALS

<table>
<thead>
<tr>
<th>Taxon Name</th>
<th>Common Name</th>
<th>Reference</th>
<th>Trophic Level</th>
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<tbody>
<tr>
<td>Berardius bairdii</td>
<td>Baird's Beaked Whale</td>
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<tr>
<td>Callorhinus ursinus</td>
<td>Northern Fur Seal</td>
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<tr>
<td>Delphinus delphis</td>
<td>Common Dolphin</td>
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<tr>
<td>Eumetopias jubatus</td>
<td>Northern or Stellar Sea Lion</td>
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<tr>
<td>Globicephala macrocephalus</td>
<td>Black-Footed or Short-Finned Pilot Whales</td>
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<td>Northern Right Whale Dolphin</td>
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<td>Physeter catodon</td>
<td>Sperm Whale</td>
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#### TROPHIC LEVEL: (-)

- BIRDS
  - Podiceps auritus
  - Podiceps grisegena
  - Phalacrocorax alutus
  - Phalacrocorax pelagicus
  - Phalacrocorax penicillatus
  - Phalaropus fulicarius
  - Tyto alba

- MAMMALS
  - Berardius bairdii
  - Callorhinus ursinus
  - Delphinus delphis
  - Eumetopias jubatus
  - Globicephala macrocephalus
  - Grampus griseus
  - Lagenorhynchus obliquidens
  - Lissodelphis borealis
  - Mesoplodon carlhubbsi
  - Phoca vitulina
  - Phocaena phocoena
  - Physeter catodon
  - Sperm Whale
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HABITAT: EUPHOTIC PELAGIC

SYSTELLAPSIS CRISTATA
SHRIMP
TOMOPTERIS CAVALLII
POLYCHAETE WORM
TOMOPTERIS WISSENDI
POLYCHAETE WORM
TOMOPTERIS PACIFICA
POLYCHAETE WORM
TRYPHANA MALMI
AMPHIPOD
VIBILIA ARMATA
AMPHIPOD
VIBILIA PROXIMQUA
AMPHIPOD
VIBILIA WOLTERECKI
AMPHIPOD

TROPHIC LEVEL: (9) INVERTEBRATE EATER - FISHES

ALLOSMERUS ELONGATUS
WHITEBAIT SMELT
ALOSA SAPIDISSIMA
AMERICAN SHAD
AMMODYTES HEXAPTERUS
PACIFIC SAND LANCE
AMPHISTICHUS RHODOTERUS
REDTAIL SURFPERCH
ATHERINOPS AFFinis
TOPSMELT
CETORHINUS NAIXINUS
BASKING SHARK
CLUPEA HARENGUS PALLAS
PACIFIC HERRING
COLOLABIS SARA
PACIFIC SAURY
CYMATOGASTER AGGREGATA
SHINER PERCH
EMBIOCTOC LATERALIS
STRIPED SEAelperch
ENGRAULIS MORDAX
NORTHERN ANCHOVY
HYPOMEUS PERTIOSUS
SURFSMELT
MICRAGODUS PROXIMUS
PACIFIC TOMCOD
ONCORYNCHUS NERKA
SockeyE SALMON
PSYCHROLUTES PARADOXUS
TADPOLE SCUPIN
SPIRINCHUS STARKSI
NIGHT SURF SMELT
SPIRINCHUS THALEICHTHYS
LONGFIN SMELT
THALEICHTHYS PACIFICUS
EULACHON OR COLUMBIA RIVER SMELT

TROPHIC LEVEL (9) INVERTEBRATE EATER - BIRDS

AYTHIA MARILA
GREATER SCAUP

ACARTIA CLAUSI
COPEPOD
ACARTIA DANAEE
COPEPOD
ACARTIA LONGERIMIS
COPEPOD
ACARTIA NEGLEGENS
COPEPOD
AEGINITUS MICROMATUS HARPACTIC
COPEPOD
AETEDEOPSIS PACIFICA
COPEPOD
AETIDEUS ARMATUS
COPEPOD
AETIDEUS PACIFICUS
COPEPOD
AMALLOTHRIX VALIDA
COPEPOD
AMALLOTHRIX VORAK
COPEPOD
ARIEGETLLUS PLUNIFER
COPEPOD
BATHYCALANUS BRADYLES
COPEPOD
BOREOONYSIS
COPEPOD
BOREOONYSIS ROSTRATA
COPEPOD
CALANUS CRISTATUS
COPEPOD
CALANUS FINMARCHICUS
COPEPOD
CALANUS PLUMCHURS
COPEPOD
CALANUS TENUICORNIS
COPEPOD
CALOCALANUS STYLIRENIS
COPEPOD
CANDACIA SIPINNATA
COPEPOD
CAVOLINA UNCINATA
COPEPOD
CENTRAUGAPT I LU$ PORCELL
COPEPOD
CENTROPAGES MCMURRICH
COPEPOD
CHIRUNDINA STREETSI
COPEPOD
CLIO BALANTIUM
PTEROPOD
CLIONE LINOCAINA
PTEROPOD
CORolla SPECTABILIS
PTEROPOD
CORYNHEAE
COPEPOD
CTENOCALANUS VANUS
COPEPOD

EPILABIDOCERA AMPHITRITES
COPEPOD
EUCALANUS ATTENUATUS
COPEPOD
EUCALANUS BUNGII
COPEPOD
EUCALANUS SAGITTATUS
COPEPOD
EUCALANUS SPINOEA
COPEPOD
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EUDINIE HORNANNI
CLADOCERAN
GAETANUS SECUNDUS
COPEPOD
GAETANUS SIMPLEX
COPEPOD
GAIUS BREVISPINUS
COPEPOD
GAIUS VARIABILIS
COPEPOD
GAUSSIA PRINCEPS
COPEPOD
GIANTOCYPRIS AGASSIZII
OSTRACOD
GNATHOPEHUSIA GIGAS
COPEPOD
GNATHOPEHUSIA INGENS
COPEPOD
HETEROPTILUS PSEUDOXYCEPHALUS
COPEPOD
HETEROSTYLUS TANNERI
COPEPOD
HETEROSTYLTES LONGICORNIS
COPEPOD
HETEROSTYLTES MAJOR
COPEPOD
LUCIUITA BICORNUTA
COPEPOD
LUCIUITA FLAVICORNIS
COPEPOD
METRIDEA LULCENS
COPEPOD
METRIDEA CURTICAUDA
COPEPOD
MICRICALANUS PYGAEMUS
COPEPOD
MICROSETELLA
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MIXTOCALANUS ROBUSTUS
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OITMONA
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ONCAEA CONIFera
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PARACALANUS PARVUS
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PAREUCHAETA BISOXURATI
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PAREUCHAETA JAPONICA
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PHEAHNA SPINIFERA
COPEPOD
PLEUROMANNA BOREALIS
COPEPOD
PLEUROMANNA SCUTULLATA
COPEPOD
PODON LEUCKARTI
CLADOCERAN
HABITAT: DISPHOTIC PELAGIC

SEBASTES DIPLOPROA
GREENNOSE ROCKFISH
SEBASTES ELOGATUS
YELLOWTAIL ROCKFISH
SEBASTES PINNIKER
CANARY ROCKFISH
SEBASTOLOBUS ALASCANUS
SHORTSPINE ROCKFISH
SOMNIOUS PACIFICUS
PACIFIC SLEEPER SHARK
SQUALUS ACANTHIAS
SPINY DOGFISH
TACTOSTOMA NACROPU$
LONGFIN DRAGONFISH
THERAGRA CHALCOGRAMNA
WALLEYE POLLOCK
TORPEDO CALIFORNICA
PACIFIC ELECTRIC RAY
TRIAKIS SEMIFASCIATA
LEOPARD SHARK

TROPHIC LEVEL: (3) CARNIVORE
MAMMALS
BERARDIUS BAIRD!I
BAIRD'S BEAKED WHALE
CALLORHINUS URNSINUS
NORTHERN FUR SEAL
KOGZA BREVICEPS
PYGMY SPERM WHALE
LISSODELPHIS 80REAL$
NORTHERN RIGHT WHALE DOLPHIN
MESOPOGON STEJNEGERI
STEJNEGER'S BEAKED WHALE
ORCINUS ORCA
KILLER WHALE
PHOECENA PHOECENA
HARBOR PORPOISE
RHOCOEHOIDES DALLI
DALL PORPOISE
PHYSETER CATODON
Sperm WHALE
STEJNEGLA COERULEOALBA
STRIPED DOLPHIN/GRAY'S PORPOISE
ZIPHEUS CAVOLOSTRIS
OVIER'S OR GOOSE BEAKED WHALE

TROPHIC LEVEL: (5) OMNIVORE
INVERTEBRATES

BENTHEOPAUSIA AMBLYOPS
EUPHASID
EUPHAUSIA PACIFICA
EUPHASID
NEMATOBRYCHION FLEXIPES
EUPHASID
NEMATOCELIS DIFFICILIS
EUPHASID
STYLOCHEIRON ABBREVIATUM
EUPHASID
STYLOCHEIRON LONGICORNE
EUPHASID
STYLOCHEIRON MAXIMUM
EUPHASID
TESSARABRACHION OCLUDATUS
EUPHASID
THYANOESSA GREGARIA
EUPHASID
THYANOESSA INSIPINATA
EUPHASID
THYANOESSA LONGIPES
EUPHASID
THYANOESSA PARVA
EUPHASID
THYANOESSA RASCHII
EUPHASID
THYANOESSA SPINIFERA EUHASPID
EUPHASID
THYSANOPODA AUCUTIFRONS
EUPHASID
THYSANOPODA CORNUTA
EUPHASID
THYSANOPODA EGREGIA
EUPHASID
TROPHIC LEVEL: (5) OMNIVORE
FISHES
SARDINOPS SAGAX
PACIFIC SARDINE
TROPHIC LEVEL: (6) PARASITE
FISHES
ENTOSPHENUS TRIDENTATUS
PACIFIC LAMPREY
LAMPIELTA AYREST
RIVER LAMPREY
TROPHIC LEVEL: (7) FILTER FEEDER
INVERTEBRATES
DOLIOLOM
SALP
HELIOCALPA VIRGULA
SALP
IASIS ZONARIA
SALP
OIKOPLEURA
LARVAEAN
PESA CONFEDERATA
SALP
SALPA FUSIFORMIS
SALP
THALIA DEMOCRATICA
SALP
THEYS VAGINA
SALP
TROPHIC LEVEL: (9) INVERTEBRATE EATER - INVERTEBRATES
ACANTHEPYRA CURTIROSTRIS
SHRIMP
BENTHEODONNA
SHRIMP
BENTHEODONNA BOREALIS
SHRIMP
CYSTISOMA FABRICII
AMPHIPOD
DAIRELLA CALIFORNICIA
AMPHIPOD
EUROHOMIA BATHYPALEGICA
ARROW-WORM
EUROHOMIA FOWLERI
ARROW-WORM
EUROHOMIA HANATA
ARROW-WORM
GENADAS INCERTUS
SHRIMP
GENADAS PROPINQUUS
SHRIMP
HYMENODORA FRONTALIS
SHRIMP
HYMENODORA GLACIALIS
SHRIMP
HYMENODORA GRACILIS
SHRIMP
HYPERIA HYSTRIX
AMPHIPOD
HYPEROCEH DEDUSARUM
AMPHIPOD
LANCEOLA LOVENI
AMPHIPOD
LYCAEA PULEX
AMPHIPOD
MENINGODORA MOLLIS
SHRIMP
NINOE GEMMA
POLYCHAETE WORM
NOTOSTOMUS JAPONICUS
SHRIMP
OXYCEPHALUS CLAUDI
AMPHIPOD
PANDALUS JORDANI
OCEAN PINK SHRIMP
PARAPASPHEA CRASSIPES
SHRIMP
PARAPASPHEA SUICATIFRONS
SHRIMP
PARAPHRONIMA CRASSIPES
AMPHIPOD
PARAPHRONIMA GRACILIS
AMPHIPOD
PARATHERMISTO PACIFICA
AMPHIPOD
PASIPHAEA CHACCI
SHRIMP
PASIPHAEA MAGNA
SHRIMP
PASIPHAEA PACIFICA
SHRIMP
PETALIIDUM SUSPIRIOM
SHRIMP
PHROMIMA SEDENTARIA
AMPHIPOD
PHROMINOPSIS SPINIFERA
AMPHIPOD
PODOBIAS MESERES
POLYCHAETE WORM
PRINNO ABYSSALIS
AMPHIPOD
PRINNO MACROPA
AMPHIPOD
RHYNCHOMEREELLA ANGELINII
POLYCHAETE WORM
SAGITTA BIERII
ARROW-WORM
SAGITTA DECIPiens
ARROW-WORM
SAGITTA ELEGANS
ARROW-WORM
SAGITTA EUNERITICA
ARROW-WORM
SAGITTA MACROCEPHALA
ARROW-WORM
SAGITTA MAXIMA
ARROW-WORM
SAGITTA MINIMA
**HABITAT:** DISPHOTIC PELAGIC

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HABITAT: ROCKY NON-VEGETATED BENTHIC

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HABITAT: ROCKY NON-VEGETATED BENTIC

TROPHIC LEVEL: (1) HERBIVORE
INVERTEBRATES

ANCIESTROLEPSIS
SLIM SNAIL

TROPHIC LEVEL: (Q)
INVERTEBRATES

ABBIETINARIA
HYDROID

TROPHIC LEVEL: (2) HERBIVORE
INVERTEBRATES

ACMAEA MIRTA
DUNCECAP LIMPET

TROPHIC LEVEL: (3) CARNIVORE
FISHES

ASTEROHECA PENTACANTHUS
BIG EYEB POUCHER

TROPHIC LEVEL: (3) CARNIVORE
INVERTEBRATES

ACMAEA LIMATULA
FILE LIMPET
ANTIPLANES ABABAREA
SNAIL
ANTIPLANES PERVERSA
SNAIL
ANTIPLANES VINOZA
SNAIL
ASTROPECTIN ARMATUS
SAND STAR
BENTHOCOPEUS
OCTOPUS
BORETROPHON STUARTI
SNAIL
BUCCINUM STRIGILLATUM
SNAIL
CADATUS STEARNSI
TOOTH SHELL
CALLISTOMA ANKULATUM
SNAIL
CHIONECTES BARDI
TANNER CRAB
CHIONECTES OPILIO
TANNER CRAB
CHIONECTES TANNERI
TANNER CRAB
COLUS ROSEUS
SNAIL
COLUS SENVIRUS
SNAIL
CROSSASTER PAPROSUS
ROSE STAR
DENTALUM
TOOTH SHELL
DERMASTERIAS IMBRICATA
LEATHER STAR
EPITOMON INDIAHORUM
SNAIL
FUSITRITION OREGONENSIS
OREGON TRITON
HENRICIA LEVISULA
BLOOD STAR
ISCNOCITON
CHITON
LEPIDAZOA
CHITON
LEPIDAZOA GOLISCHI
CHITON
LEPTOCRITON
CHITON

TROPHIC LEVEL: (3) CARNIVORE
FISHES

AKOPLIOPA Fimbria
SALISH FISH
ATHERINUS STOJAS
TURBUT OR ARROWTOOTH FLounder
BROSMYS PHYCIS MARGINATA
RED IROTULA
CHITOTUS PUGENSIS
ROUGHBACK SCULPIN
CITHALICHTYS SORDIDUS
PACIFIC SANTA
DASYCITUS SETIGER
SPINHED SCULPIN
DELOPIS GIGANTEA
GIANT WARYOUTH
HABITAT: MUD NON-VEGETATED BENTHIC

EOPSETTA JORDANI
PETRALE SOLE
EPTATRETUS DEANI
BLACK HAGFISH
EPTATRETUS STOUTI
PACIFIC HAGFISH
GADUS MACROCEPHALUS
PACIFIC COD
GLYPTOCEPHALUS ZACHIRUS
Rex Sole
HEXAGRAMMOS DECAGRAMMUS
KELP GREENLING
HEXAGRAMMOS STELLERI
WHITE SPOTTED GREENLING
HEXANCHUS GRSEUS
SIXGILL SHARK
HIPPOGLOSSOIDES ELASSOEO~
FLATHEAD SOLE
HIPPOGLOSSUS STENOLEPS
PACIFIC HALIBUT
HYDROLAGUS COLLIE[ ]
RATFISH
ICELINUS FL]LANENTOSUS
THREADFIN SCULPIN
ISOPSETTA ISOLEPIS
BUTTER SOLE
LYCO00PSIS PACIFICA
BLACKBELLY EELPOUT
LYOPSETTA EXELIS
SLENDER SOLE
MICROSTOMUS PACIFICUS
DOVER SOLE
OPHIO00N ELONGATUS
LINGCOD
PAROPHRYS VETULUS
ENGLISH SOLE
PLATITCHYTHS STELLATUS
STARRY FLounder
PORICHYTHS NOTATUS
PLAINFIN MIDSHPMEN
PSEITITCHYTHS MELANOSTICUTUS
SAND SOLE
RAJA BINOULATA
BIG SKATE
RAJA KINCAIDI
BLACK SKATE
RAJA RHINA
LONGNOSE SKATE
RAJA STELLULATA
STARRY SKATE
SCORPAENICHTHYS NARMORATUS
CABEZON
SEBASTES CAURINUS
COPPER ROCKFISH
SOMNIOUS PACIFICUS
PACIFIC SLEEPER SHARK
SQUALUS ACANTHias
SPINY DOGFISH
TORMEO CALIFORNICA
PACIFIC ELECTRIC RAY
TROPHIC LEVEL: (3) CARNIVORE MAMMALS
ELMUITOPiAS JUBATUS
NORTHERN OR STELLAR SEA LION
KOGIA BREVICEPS
PYGNY SPERM WHALE
PHOCA VITULINA
HARBOR SEAL
PHOCENA PHOCENA
HARBOR PORPOISE
PHYSETER CATODON
SPERM WHALE
ZALOPHUS CALIFORNIANUS
CALIFORNIA SEA LION
TROPHIC LEVEL: (4) DETRITIVORE INVERTEBRATES
ALLOCENTROTUS FRAGILIS
SEA URCHIN
AMPHIOPLUS STRONGYLOPLAX
BRITTLE STAR
APHIURA SARSII
BRITTLE STAR
BANKIA SETACEA
TEREDO
BRISASTER LATIFRONS
SEA URCHIN
LUMBRINERIS BICIRRATA
POLYCHAETE
LUMBRINERIS SIMILABRIS
POLYCHAETE
MACOMA ALCAEA
CHALKY CLAM
MAGELONA JAPONICA
POLYCHAETE
MOLPADI A MEDIA
SEA CUCUMBER
OPHIOPHILUS BAKERI
BRITTLE STAR
OPHURIA LUTKENI
BRITTLE STAR
PARASTIC~ CALIFORNICUS
Giant Red SEA CUCUMBER
PENTANTHERA PSEUDOCALCIGERA
SEA CUCUMBER
TELLINA BUTTONI
BUTTON'S TELLIN CLAM
XYLOPHAGA WASHINGTONI
WASHINGTON WOODEATER
TROPHIC LEVEL: (5) OMNIVORE INVERTEBRATES
AMPHISSA VERSICOLOR
SMAIL
GORGONOCEPHALUS CARYI
BASKET STAR
CREMAPOTA
SMAIL
PSEUDARCHASTER PARELII ALASCEN
SEA STAR
TROPHIC LEVEL: (6) PARASITE FISHES
ENTOSPHEMUS TRIDENTATUS
PACIFIC LAMPREY
LAMPETRA AYREI
RIVER LAMPREY
TROPHIC LEVEL: (7) FILTER FEEDER INVERTEBRATES
ACILIA CASTRENSIS
DIVARICATE NUT CLAM
AXINOPSIDA SERICATA
CLAM
CARDIOMYA OLOROYDI
CUSPIDARIA CLAM
CARDIOMYA PLANETICA
CLAM
CARDITA STERNISII
CLAM
CARDITA VENTICOSA
CLAM
CHLAMYS NASTATUS HERICUS
PACIFIC PEAR SCALLOP
CHLAMYS HINDSI
HINO'S CLAM
CLINOCARDIUM NUTALLI
BASKET COCKLE
COMPSODIA SUBDIAPHANA
CLAM
CRENELLA COLUMBIANA
CLAM
EUPLEXAURA MARKI
SEA PEN
HUXLEYA MUNITA
CLAM
LIEOPTULUS QUADRANGULARIS
SEA PEN
LYNOSIA STRIATA
CLAM
NEMOCARDIUM CENTRIISOMUS
HUNDRED-LINED COCKLE
NUCULA TENUIS
CLAM
NUCULANA AUSTINI
CLAM
NUCULANA PERNULS
CLAM
PATIOPECTIN CAURINUS
WEATHERVANE SCALLOP
PECTEN CAURINUS
GIANT PACIFIC SCALLOP
PROTOTHACA STANINEA
ROCK COCKLE
PSEPHIDIA LORI
CLAM
SAXICAVA ARCTICA
ARCTIC SAXICLEAVE CLAM
SCLEROPTILUM
SEA PEN
SOLEMYA AGASSIZI
AWNING CLAM
STYLAELA LONGATA
SEA PEN
THRACIA CURTA
CLAM
THRACIA TRAPEZIOIDES
CLAM
THYSIRAH BARBARENSIS
CLAM
VENETIACARDIA VENTRICOSA
STOUT CARDITA CLAM
YOLDIA LINHATULA GARDNERI
FILE YOLDIA CLAM
TROPHIC LEVEL: (8) SCAVENGER INVERTEBRATES
HABITAT: MUD NON-VEGETATED BENTHIC

TROPHIC LEVEL: (9) INVERTEBRATES

APHRODITE JAPONICA POLYCHAETE
ARCTONOE PULCHRA POLYCHAETE
CARINOMELLA LACTEA RIBBON WORM
CEREBRATULUS CALIFORNIIENSIS RIBBON WORM
CHORILLIA LONGIPES SHRIMP
CRANGON COMMUNIS SHRIMP
CRANGON FRANCISORUM SHRIMP
ENIPO GRACILIS POLYCHAETE
GLYCERA AMERICANA POLYCHAETE
HAPLOSCOLOPUS ELONGATUS POLYCHAETE
MAGELONA PAPILLICORNIS POLYCHAETE
MAGELONA PITELIKAI POLYCHAETE
NEPHRTYS GADOIDES POLYCHAETE
NEPHRTYS CILIATA POLYCHAETE
NEPHRTYS CORMUTA POLYCHAETE
NEPHRTYS FERRUGINEA POLYCHAETE
NEPHRTYS LONGOSETO M POLYCHAETE
PANDALUS JORDANI OCEAN PINK SHRIMP
PANDALUS PLATYCEPHOS SPOT SHRIMP
PISTA CRISTATA POLYCHAETE
PISTA FIMORIATA POLYCHAETE
PRAXILELLA GRACILIS POLYCHAETE
SPIRONTOCARIS LAMELLOCOONIS SHRIMP
SPIRONTOCARIS HOLMESI SHRIMP

TROPHIC LEVEL: (9) INVERTEBRATE EATER - FISHES

AGONOPSIS EMELANE
NORTHERN SPEARNOSE POACHER
AGONUS ACIPENSERIMUS STURGEON POACHER

CLUPEA HARENGUS PALLASI PACIFIC HERRING
LEPTOCOTTUS ARNATUS PACIFIC STAGNOGEN SCULPIN
LIPARIS PULCHELLUS SHOWY SNAILFISH
LUMENUS SAGITTA SHARK PRICKLEBACK
LICHTENHOLTZ ALEUTENSIS DURF WRYMOUTH
MICROGADUS PROXIMUS PACIFIC TONCOD
POROCLINIS ROTHROCKI WHITEBARRED BLENHY
PSYCHROLUTES PARADOXUS TADPOLE SCULPIN
RADULINUS ASPRELLUS SLIM SCULPIN
XENERIUS LATIFRONS BLACKTIP POACHER

TROPHIC LEVEL: (-) INVERTEBRATES

ABIETINARIOPSIS HYDROID
ABIETINARIOPSIS ABIETINA HYDROID
ABIETINARIOPSIS ALEXANDERI HYDROID
ABIETINARIOPSIS TRASKI HYDROID
ACRYPTOLARIA HYDROID
AGLAOPHENIA HYDROID
AGLAOPHENIA DIESGUESIS HYDROID
AGLAOPHENIA INCONSPICUA HYDROID
AGLAOPHENIA OCTOCARPA HYDROID
CAMPAULARIA HYDROID
CAMPAULARIA VERTICILLATA HYDROID
CAMPAULARIA VOLUBLIS HYDROID
HALECIUM CORRUGATUM HYDROID
HIPPASTERIA SPINOSA SEA STAR
LAFOEA ADNATA HYDROID
LAFOEA DUNOSA HYDROID
LAFOEA FRUTICOSA HYDROID
LAFOEA GRACILLIMA HYDROID
MEISTER AQUAHLIS VERHILLION STAR

TROPHIC LEVEL: (0) FISHES

Pleuronichthys coenosus C-O SOLE
**HABITAT: MUD NON-VEGETATED BENTHIC**

<table>
<thead>
<tr>
<th>Trophic Level</th>
<th>Invertebrates</th>
</tr>
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<tbody>
<tr>
<td>(2) Herbivore</td>
<td>Invertebrates</td>
</tr>
<tr>
<td><strong>ACMAEA MITRA</strong></td>
<td>DUNCECAP LIMPET</td>
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<td>(2) Herbivore</td>
<td>Fishes</td>
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<tr>
<td><strong>ASTEROTHECA PENTACANTHUS</strong></td>
<td>BIGEYE POACHER</td>
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<tr>
<td>(3) Carnivore</td>
<td>Invertebrates</td>
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<tr>
<td><strong>ACMAEA LIMATULA</strong></td>
<td>FILE LIMPET</td>
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<td><strong>ANTIPLANES ABARBAREA</strong></td>
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<td><strong>ASTROPECTIN ARMATUS</strong></td>
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<td><strong>BENTHOCTOPUS</strong></td>
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<tr>
<td><strong>BORETROPHON STUARTI</strong></td>
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<tr>
<td><strong>BUCCINUM STRIGILLATUM</strong></td>
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<tr>
<td><strong>CADULUS STEARNSII</strong></td>
<td>TOOTH SHELL</td>
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<tr>
<td><strong>CALLIOSTOMA ANNULATUM</strong></td>
<td>SNAIL</td>
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<tr>
<td><strong>CHIONECTES BAIRDI</strong></td>
<td>TANNER CRAB</td>
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<tr>
<td><strong>CHIONECTES OPILIO</strong></td>
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<td><strong>CHIONECTES TANNERI</strong></td>
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<tr>
<td><strong>COLUS ROSEUS</strong></td>
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<tr>
<td><strong>COLUS SERVINUS</strong></td>
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<td><strong>CROSSASTER PAPOSUS</strong></td>
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<td><strong>DERMASTERIAS IMBRICATA</strong></td>
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<td><strong>EPITONIUM INDIANORUM</strong></td>
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<td><strong>FUSITRITIOM OREGONENSIS</strong></td>
<td>OREGON TRITON</td>
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<td><strong>HENRICIA LEVISCULA</strong></td>
<td>BLOOD STAR</td>
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<tr>
<td><strong>ISCHNOCRITON</strong></td>
<td>CHITON</td>
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<td><strong>LEPIDAZOMA</strong></td>
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<tr>
<td><strong>LEPIDAZOMA GOLISCHI</strong></td>
<td>CHITON</td>
</tr>
<tr>
<td><strong>LEPTOCRITON</strong></td>
<td>CHITON</td>
</tr>
</tbody>
</table>
HABITAT: MUDDY SAND NON-VEGETATED BENTHIC

LISCHKEA CIDARIS
SNAIL
LUTILLA FOLIATA
SAND STAR
METRIDIUM FIMBRIATUM
SEA ANEMONE
MITRELLA GOULDI
SNAIL
NASSARIUS FOSSATUS
SNAIL
NASSARIUS MENDICUS
SNAIL
NATICA CLAUDIA
SNAIL
NEPTUNEA LYRATA
SNAIL
OCTOPUS DOLFEINI
OCTOPUS
PISASTER BREVISPINOSUS
SHORT-SPIKED PISASTER
PISASTER GIANTUS
GIANT STAR
PISASTER OCHRACEOUS
PURPLE STAR
POLINICES LEWISII
MOON SNAIL
POLINICES PALLIDUS
MOON SNAIL
POLYPUS
OCTOPUS
PISASTER TESSELLATUS ARCUATUS
SLIME STAR
PUNCTURELLA CUCULATA
LINPET
PYGOPODIA HELIANTHOIDES
SUNFLOWER STAR
ROSSIA PACIFICA
SQUID
SOLASTER DAWSONI
MORNING SUN STAR
SOLASTER SIMPSONII
SUN STAR
STYLASTERIAL FORRENI
SEA STAR
TACHYRHYNCHUS LACTEOLUS
SNAIL
TACHYRHYNCHUS PRATOMON
SNAIL
THRICANOTHITAS PENCILATUS
SEA STAR
TRITONIA
NUDEBRANCH
TROPHON TRIPHERUS
SNAIL
TROPHIC LEVEL: (3) CARNIVORE
FISHES

DELOLEPIS GIGANTEA
GIANT WRYMOUTH
EUPHETRUS JORDANI
PETRALE SOLE
EPATREUS DEANI
BLACK HAGFISH
EPATREUS STOUTI
PACIFIC HAGFISH
GADUS MACROCEPHALUS
PACIFIC COD
GLYPTOPSEUS ZACHARIUS
REX SOLE
HEXACRITTUS DECAGRAMMUS
KELP GREENLING
HEXACRITTUS STELLERI
WHITESPOTTED GREENLING
HEXANCHUS GRISUS
SIXGILL SHARK
HIPPOLGOSSOIDES ELLASSODON
FLATHEAD SOLE
HIPPOLGOSSOIDES STENCILPES
PACIFIC HALIBUT
HYDORPLOGUS COLLIEI
RAFFISH
ICELINUS FILAMENTOSUS
THREADFIN SCUP
ISOSPERTA ISOLEPIS
BUTTER SOLE
LYOPSERTA EXILIS
SLENDER SOLE
MICROSTOMUS PACIFICUS
DOVER SOLE
OPHIODON ELONGATUS
LINGCOD
PAROPHYRIS VETULUS
ENGLISH SOLE
PLATICHYTHYS STELLATUS
STARRY FLounder
POIKIORYTHYNTHS NOTATUS
PLAINFIN MIDSHIPMAN
PSEUDICHTHYS MELANOOSTICUS

TROPHIC LEVEL: (4) DETRITIVORE
INVETEBRATES

ACIPENSER TRANSMONTANUS
WHITE STURGEON
ATHERINUS STOMIAS
TURBOT OR ARCOuates FLOUNDER
CHITONOTUS PUGETENSIS
ROUGHBACK SCUP
CITRICHYTHYS SORDIDUS
PACIFIC SANDDAB
CITRICHYTHYS SIGMAEUS
SPECKLED SANDDAB
DASYCOTUS SETIGER
SPINYHEAD SCUP

PHOCENA PHOCENA
HARPOR PORPOISE
PHYSODORUS HADALON
SPEM WHALE
ZALOHIUS CALIFORNIANUS
CALIFORNIA SEA LION

TROPHIC LEVEL: (4) DETRITIVORE
INVETEBRATES

ALLOHENTROTUS FRAGILIS
SEA URCHIN
AMPHIOPLUS STRONGYLOPLAX
BRITTLE STAR
APHIARIA SARSII
BRITTLE STAR
BANK A SETACEA
TERIDO
BRISSTER LATIFRONS
SEA URCHIN
DENDASTER EXCENTRICUS
SAND DOLLAR
LEPTOPODODES
SEA CUCUMBER
LISTIOLOUS HEXAMYOTUS
ECHIDURID WORM
LOPHILOTHOIDES FORAMINATUS
BOX CRAB
LOPHILOTHOIDES MANDI
PUG T SOUND KING CRAB
LUMBINATION BICIRRATA
POLICHAETE
LUMBINATION SIMILABRIS
POLICHAETE
MACONIA ALCARAE
CHAFLY CLAM
MAGELONA JAPONICA
POLICHAETE
POLPIDIA INTERMEDIA
SEA CUCUMBER
OPHTHOLUS BAKERI
BRITTLE SAND SOLE
OPHILACA LUTKENI
BRITTLE STAR
PARACITOPUS CALIFORNICUS
GIANT RED SEA CUCUMBER
FENILU S PSEUDOCALIGERA
SEA CUCUMBER
TELL M BUTTONI
BUTTON'S TELLIN CLAM
XYLOHAGA WASHINGTONA
WASHINGTOE WOODIEATER

TROPHIC LEVEL: (5) OMNIVORE
INVETEBRATES

AMPH SSA VERSICOLOR
SNAI L
CORYNEOPHUS CARYI
BASKET STAI R
GENOSITA
SNAI L
PSEUDICHTHYS PARELLI ALASCEN
SEA STAR

TROPHIC LEVEL: (6) PARASITE
FISH

ENTOPHROUS TRIDENTATUS
PACIFIC LAMPREY
HABITAT: MUDDY SAND NON-VEGETATED BENTHIC

LAMPERTA AYRESI  
RIVER LAMPEY

TROPHIC LEVEL: (7) FILTER FEEDER
INVERTEBRATES

ACILIA CASTRENSIS  
DIARICATE NUT CLAM
AKHOPISUDA SERICATA  
CLAM
CARDIOMYA OLROYDI  
CUSPIDARIA CLAM
CARDIOMYA PLANETICA  
CLAM
CARDITA STEARNSSII  
CLAM
CARDITA VENTICOSA  
CLAM
CHLAMYX HASTATUS HERCIU  
PACIFIC PEAR SCALLOP
CHLAMYX HINDI  
HIND'S CLAM
CLMODECARDIUM MUTALLI  
BASKET COCKLE
COMPSONYX SUBDIAPHA  
CLAM
CRENEXLLA COLUMBIANA  
CLAM
CUPLEXARURA MARI  
SEA PEN
HUXLEYA MUNITA  
CLAM
LIEOPTULUS QUADRANGULARIS  
SEA PEN
LYONSIA STRIATA  
CLAM
NEMOCARDIUM CENTRIFILOSUM  
HUNDRED-LINED COCKLE
NUCULANA TENUIS  
CLAM
NUCULANA AUSTIN  
CLAM
NUNCULANA PERNULS  
CLAM
PATINEPECTIN CAURINUS  
WETHERVANE SCALLOP
PECTEN CAURINUS  
Giant Pacific ScalloP
PROTOTHACA STAMINAE  
ROCK COCKLE
PSEPHIDIA LORDI  
CLAM
PSOLUS SQUAMATUS  
SEA CUCUMBER
SAXICAVA ARCTICA  
ARCTIC SAXICLEAVE CLAM
SCEROPTILUM
SEA PEN
SOLENYA AGASSIZI  
AMWING CLAM
STYLATULA ELONGATA  
SEA PEN
THRACIA CURTA  
CLAM
THRACIA TRAPEZOIDES  
CLAM
THYSASIRA BARBAIRENSIS  
CLAM
VENORCARDIOPA VENTICOSA  
STOUT CARDITA CLAM

YOLDIA LIMATULA QAIDERI  
FILE YOLDIA CLAN

TROPHIC LEVEL: (8) SCAVENGER
INVERTEBRATES

CANCER MAGISTER  
DUNGENESS CRAB
OLIVEWELL
OLIVE SNAIL
PAGURISTES TURIGUS  
HERMIT CRAB
PAGURUS ALEUTICUS  
HERMIT CRAB
PAGURUS OCTOTENSIS  
HERMIT CRAB
PAGURUS TANNERI  
HERMIT CRAB

TROPHIC LEVEL: (9) INVERTEBRATE EATER - INVERTEBRATES

APHRODITE JAPONICA  
POLYCHAETA
ARCTONOE PULCHRA  
POLYCHAETA
CARIOMELLA LACTEA  
RIBBON WORM
CEREBRATUS CALIFORNIENSIS  
RIBBON WORM
CHORILLIA LONGIPES  
SHRIMP
CRANGOM COMMUNIS  
SHRIMP
CRANGOM FRANCISORUM  
SHRIMP
EMPIO GRACILIS  
POLYCHAETA
GLYCERA AMERICANA  
POLYCHAETA
HAPLOSCOLOPUS ELONGATUS  
POLYCHAETA
MAGELONA PAPILICORNIS  
POLYCHAETA
MAGELONA PETIELKAI  
POLYCHAETA
NEPHYS CADDIDES  
POLYCHAETA
NEPHYS CILIATA  
POLYCHAETA
NEPHYS CORNUTA  
POLYCHAETA
NEPHYS FERRUGINEA  
POLYCHAETA
NEPHYS GLOSOSETOSA  
POLYCHAETA
PANDALUS JORDANI  
OCEAN PINK SHRIMP
PANDALUS PLATYCEPHOS  
SPOT SHRIMP
PISTA CRISTATA  
POLYCHAETA
PISTA FINGRIATA  
POLYCHAETA
PRAXILELLA GRACILIS  
POLYCHAETA
SPIRONTOCARIS LAMELLOCCNOSIS  
SHRIMP
SPIRONTOCARIS HOLMSE  
SHRIMP

TROPHIC LEVEL: (10) INVERTEBRATE EATER - FISHES

AGONOPIS EMELANE  
NORTHERN SPEARNOSE POACHER
AGONUS ACIPENSERINUS  
STURGEON POACHER
CLUWA HARENGUS PALLASI  
PACIFIC HERRING
LEPTOCOTYUS ARMATUS  
PACIFIC STAGHORN SCULPIN
LIPARIUS PULCHELLUS  
SHOAL SNAILDISH
LUSPENUS SAGITTIS  
SNAILS PRICKLEBACK
LYCENETES ALEUTENSIS  
DWARF WRYMOUTH
MICROGADUS PROXIMUS  
PACIFIC TONCOD
PORCELLINUS ROTHROCKI  
WHITEBARED BENVNY
PEYCHDULITES PARADOXUS  
TADPOLE SCULPIN
RADULUS ASPRELLUS  
SLIM SCULPIN
XENOREMUS LATIFRONS  
BLACKTIP POACHER

TROPHIC LEVEL: (-)
INVERTEBRATES

ANCSTROLEPSIS  
SNAIL
COLUS MALDONUS  
SNAIL

TROPHIC LEVEL: (Q)
INVERTEBRATES

ABIETINARIA  
HYDROID
ABIETINARIA ABETINA  
HYDROID
ABIETINARIA ALEXANDERI  
HYDROID
ABIETINARIA TRASKI  
HYDROID
ACRYPTOLARIA  
HYDROID
AGLAPHEMIMA  
HYDROID
AGLAPHEMIMA DIEGENIS  
HYDROID
AGLAPHEMIMA INCONSPICUA  
HYDROID
AGLAPHEMIMA OCTOCARPA  
HYDROID
CAMPAULARIA  
HYDROID
CAMPAULARIA VERTICILLATA  
HYDROID
CAMPAULARIA VOLUMILIS  
HYDROID
HALCILIUM CORRUGATUM  
HYDROID
HIRPASTERIA SPINOSA  
SEA STAR
LAFOEZA ADNATA  
HYDROID
LAFOEZA DUNOSA
HABITAT: MUDDY SAND NON-VEGETATED BENTHIC

HYDROID
LAFEOA FRUTICOSA
HYDROID
LAFEOA GRACILLIMA
HYDROID
MEDIASTER AEQUALIS
VERMILLON STAR
NEPTUNEA PRIBILOFFENSIS
SNAIL
PLUMULARIA ALICIA
HYDROID
RATHBUNASTER CALIFORNICUS
SEA STAR
SERTULARIELLA TURGIDA
HYDROID
THUIARA ROBUSTA
HYDROID

TROPHIC LEVEL: (G)
FISHES
PLEUROMICHTHYS COENOSUS
C-O SOLE
HABITAT: SAND NON-VEGETATED BENTHIC

TROPHIC LEVEL: (2) HERBIVORE
INVERTEBRATES

ACHAEA NITRA
DUNCECAP LIMPET

TROPHIC LEVEL: (2) HERBIVORE
FISHES

ASTEROTHECA PENTACANTHUS
BIGEYE POACHER

TROPHIC LEVEL: (3) CARNIVORE
INVERTEBRATES

ACMAEA LINATULA
FILE LIMPET

TROPHIC LEVEL: (1) CARNIVORE
MAMMALS

LEPTOCHITON
CHITON
LISSCHKEIA CIDARIS
SNAIL
LUDIA FOLIATA
SAND STAR
METRIDIID Fimbriatum
SEA ANEMONE
MITRELLA GOULDI
SNAIL
NASCARIUS FOSSATUS
SNAIL
NASCARIUS MENDICUS
SNAIL
NATICA CLAUSA
SNAIL
NEPTUNEA LYRATA
SNAIL
OCTOPUS DOLFELIN
OCTOPUS
PISASTER BREVISPINUS
SHORT-SPINED PISASTER
PISASTER GIANT
GIANT STAR
PISASTER OCHRACEOUS
PURPLE STAR
POLINICES LEHISI
MOON SNAIL
POLINICES PALLIDUS
MOON SNAIL
POLYPUS
OCTOPUS
PTERASTER TESSELATUS ARCUATUS
SLIME STAR
PUNCUTELLA CUCULATA
LIMPET
PYCNOPODIQ HELIANTHOIDES
SUNFLOWER STAR
ROSSIA PACifica
SQUID
SOLASTER DAWSON
MORNING SUN STAR
SOLASTER STIMPSON
SUN STAR
STYALISTELLA FORERRI
SEA STAR
TACHYRHYNCHUS LACTEOLUS
SNAIL
TACHYRHYNCHUS PRATUMON
SNAIL
THIASSACANTHIAS PENCILATUS
SEA STAR
TROPHON TRIPHERUS
SNAIL

TROPHIC LEVEL: (3) CARNIVORE
FISHES

ACIPENSER TRANSMONTANUS
WHITE STURGEON
BROSCHMYCIS MARGINATA
RED BROTLA
CHITONOTUS PUGETENSIS
ROUGHBACK SCALPIN
CITARICHNYS SORDIDUS
PACIFIC SANDAB
CITARICHNYS STIGMAEUS
SPOCKLED SANDAB
DASYCOTUS SETIGER
SPINYHEAD SCALPIN
EOPSETTA JORDANI
PETRALE SOLE
GADUS MACROCEPHALUS
PACIFIC COD
GLYPTOCHEIUS ZACHIRUS
REX SOLE
HEXAGRAMMOS DECAGRAMMUS
KELP GREENLING
HEXAGRAMMOS STELLERI
WHITESOTTED GREENLING
HEXACNUS GRISEUS
SIXGILL SHARK
HIPPOGLOSSOIDES MELASSOMON
FLATHEAD SOLE
HIPPOGLOSSUS STENOLEPIS
PACIFIC HALIBUT
HYDROLAUS COLLEI
RATFISH
ICELINUS FILAMENTOSUS
THREADFIN SCALPIN
ISOPSETTA ISOLEPIS
BUTTER SOLE
LYOPSETTA EXLIS
SLENDER SOLE
MICROSTOMUS PACIFICUS
DOVER SOLE
OPHIOCOD ELOGATUS
LINGCOD
PAKOPHTYS VETULUS
ENGLISH SOLE
PLATICHNYS STELLATUS
STARRY FLOWERED
PORICHNYS NOTATUS
PLAINFIN MIDSHIPMEN
PSEITCHNYS MELANOSTICUS
SAND SOLE
RAJA GINOCULATA
BIG SKATE
RAJA KINCAID
BLACK SKATE
RAJA RHINA
LONGNOSE SKATE
RAJA STELLULATA
STARRY SKATE
SCOPRAEHCHNYS MARMORATUS
CABEZO
SQUALUS ACOATHIAS
SPINY DOGFISH
TORPEDO CALIFORNIQ
PACIFIC ELECTRIC RAY
TRIAXIS SEMIFSACIATA
LEOPARD SHARK

TROPHIC LEVEL: (3) CARNIVORE
MAMMALS

ELMOTEPAS JAGUAR
NORTHERN OR STELLAR SEA LION
KOGIA BREVIcep
PYGMY SPERM WHALE
PHOCA VITULINA
HARBOR SEAL
PHOCOAENA PHOCENA
HARBOR PORPOISE
PHYSETER CATODON
SPERM WHALE
ZALOPS CALIFORNIANUS
CALIFORNIA SEA LION
<table>
<thead>
<tr>
<th>HABITAT: SAND NON-VEGETATED BENTHIC</th>
</tr>
</thead>
</table>

**Trophic Level: (4) Detritivore Invertebrates**

- Zipheus cavirostris
- Cuvier's or Goose Beaked Whale

**Trophic Level: (5) Omnivore Invertebrates**

- Allocentrotus fragilis
- Sea Urchin
- Amphiopeus strongyloplax
- Brittle Star
- Aphria sarsi
- Brittle Star
- Bankia setacea
- Teredo
- Brisaster latirtrons
- Sea Urchin
- Dendraster excentricus
- Sand Dollar
- Lophololithoides foraminatus
- Box Crab
- Lophololithoides manditii
- Puget Sound King Crab
- Lumbrineris bicirrata
- Polychaete
- Lumbrineris similabris
- Polychaete
- Macoma alcarea
- Chalky Clam
- Magelona japonica
- Polychaete
- Mophasia intermedia
- Sea Cucumber
- Ophiopolis bakeri
- Brittle Star
- Ophira lutkeni
- Brittle Star
- Parasichthys californicus
- Giant Red Sea Cucumber
- Pentamerus pseudocalcigera
- Sea Cucumber
- Strongylocentrotus echinoides
- Sea Urchin
- Tellina buttoni
- Button's Tellin Clam
- Xylophaga washingtonnsa
- Washington Wood Eater

**Trophic Level: (6) Parasite Fishes**

- Lampetra ayresi
- River Lamprey

**Trophic Level: (7) Filter Feeder Invertebrates**

- Acilia castrensisi
- Divaricate Nut Clam

**Trophic Level: (8) Scavenger Invertebrates**

- Axinopsida sericata
- Clam
- Cardioma oldroydi
- Cuspideria Clam
- Cardioma planeta
- Clam
- Cardita stearnsi
- Clam
- Cardita venticosas
- Clam
- Chlamys hastatus hericus
- Pacific Pear Scallop
- Chlamys hindsii
- Hinds' Clam
- Clinocardium nutalli
- Basket Cockle
- Compsomyax subtiaphana
- Clam
- Crenella columbiana
- Clam
- Euplexaura marki
- Sea Pen
- Huxleya munia
- Clam
- Lioptopus quadrangularis
- Sea Pen
- Lyonsia striata
- Clam
- Menocardium centrifilosum
- Hundred-Lined Cockle
- Mucula tenuis
- Clam
- Muculana austral
- Clam
- Muculana permula
- Clam
- Patinopictina caurinus
- Weathervane Scallop
- Pecten caurinus
- Giant Pacific Scallop
- Protobrachia staminea
- Rock Cockle
- Psephidia lordi
- Clam
- Psolus squamatus
- Sea Cucumber
- Saxicava arctica
- Arctic Saxiclave Clam
- Scleroptilum
- Sea Pen
- Silichia patula
- Pacific Razor Clam
- Silichia solati
- Slow's Razor Clam
- Solenya agassizii
- Awnng Clam
- Styliolata elongata
- Sea Pen
- Turacia curta
- Clam
- Turacia trapezoidea
- Clam
- Thysia barbara
- Thysia barbara
- Clam
- Venericardia ventricosa
- Stout Cardita Clam
- Yoldia limulata gáidræ
- File Yoldia Clam

**Trophic Level: (9) Invertebrate Eaters**

- Alcina castrensisi
- Divaricate Nut Clam
HABITAT: SAND NON-VEGETATED BENTHIC

TROPHIC LEVEL: (9) INVERTEBRATE EATER - FISHES

AGONOPSIS EMTELANE
NORTHERN SPEARNOSE POACHER
AGONUS ACIPENSERINUS
STURGEON POACHER
AMMODYTES HEXAPTERUS
PACIFIC SAND LANCE
AMPHISTICHUS RHODOTERUS
REDTAIL SURFPERCH
CLUPEA HARENGUS PALLASI
PACIFIC HERRING
CYNATOGASTER AGGREGATA
SHINER PERCH
EMBIOGOTA LATERALIS
STRIPED SEAPEAR
LEPTOCOTTUS ARAMATUS
PACIFIC STAGHORN SCULPIN
LIPARIS PULCHELLIUS
SHOWY SNAILFISH
MICROGADUS PROXINUS
PACIFIC TOMCOD
POROCLINIS ROTHROCKI
WHITEBARRED BLENNY
PSYCHROLUTES PARADOXUS
TADPOLE SCULPIN
RADULINUS ASPRELLUS
SLIM SCULPIN
XENERETRUS LATIFRONS
BLACKTIP POACHER

TROPHIC LEVEL: (-) INVERTEBRATES

ANCISTROLEPSIS
SNAIL
COLUS HALIDONUS
SNAIL

TROPHIC LEVEL: (Q) INVERTEBRATES

ABIEITINARIA
HYDROID
ABIEITINARIA ABETINA
HYDROID
ABIEITINARIA ALEXANDERI
HYDROID
ABIEITINARIA TRASKI
HYDROID
ACRYPTOLARIA
HYDROID
AGLAOPHENIA
HYDROID
AGLAOPHENIA DIEGENSIS
HYDROID
AGLAOPHENIA INCONSPICUA
HYDROID
AGLAOPHENIA OCTOCARPA
HYDROID
CAMPANULARIA
HYDROID
CAMPANULARIA VERTICILLATA
HYDROID
CAMPANULARIA VOLUBILIS
HYDROID
HALECIUM CORRUGATUM
HYDROID
HIPPASTERIA SPINOSA

SEA STAR
LAFOEA ADNATA
HYDROID
LAFOEA DUNOSA
HYDROID
LAFOEA FRUTICOSA
HYDROID
LAFOEA GRACILLIMA
HYDROID
MEDIASTER AEQUALIS
VERMILLON STAR
NEPTUNEA PRIBILOFFENSIS
SNAIL
PLUMULARIA ALICIA
HYDROID
SERTULARELLA TURGIDA
HYDROID
THUIARA ROBUSTA
HYDROID

TROPHIC LEVEL: (Q) FISHES

PLEURONICHTHYS COENOSUS
C-O SOLE
HABITAT: KELP FORESTS VEGETATED BENTHIC

TROPHIC LEVEL: (1) PRODUCER
PLANTS

AGARDIELLA TENERA
RED ALGAE
AGARUM FIMBRIATUM
KELP
ANTITHAMNION PACIFICUM
RED ALGAE
BOTRYOCCLADIA PSEUDODICHOTOMA
RED ALGAE
CALLOPHYLLIS EDENTATA
RED ALGAE
CERAMIUM CALIFORNICUM
RED ALGAE
CONSTANTINIA SUBULIFERA
RED ALGAE
CRYPTOPLEURA RUPRECHTII
RED ALGAE
DELESSERIA DECIPIENS
RED ALGAE
DILSEA CALIFORNICUM
RED ALGAE
EGREGIA HENZIESII
KELP
EISENIA ARBOREA
KELP
GELIDUM ROBUSTUM
RED ALGAE
GIGARTINA EXASPERATA
RED ALGAE
GRATELOPORA CALIFORNICUM
RED ALGAE
HYMENEA SETCHELLII
RED ALGAE
LAMINARIA GROENLANDICA
KELP
LAMINARIA SACCHARINA
KELP
LAMINARIA SETCHELLII
KELP
MACROCYSTIS INTEGRIFOLIA
GIANT KELP
NEROCYSTIS LUETKEANA
GIANT KELP
OPUNTIELLA CALIFORNICUM
RED ALGAE
PHYLLOPADIX TERRIYI
SEA GRASS
PLOCAMITUM PACIFICUM
RED ALGAE
POLYNEURO LAISSINOA
RED ALGAE
PORPHYRA PERFORATA
RED ALGAE
PRIONITIS LANCEOLATA
RED ALGAE
PTERYGOPHORA CALIFORNICUM
KELP
RHODOMENIA PERTUSA
RED ALGAE
RHODOPTILUM PLUMOSUM
RED ALGAE
SAWINA HAIADUM
RED ALGAE
STENOGRAMMJE INTERUPTA
RED ALGAE
TROPHIC LEVEL: (2) HERBIVORE
INVERTEBRATES

ACHAEA MITRATA
DUNCECAP LIMPET
STRONGYLOCENTROTUS FRANZISCHANK
GIANT RED URCHIN
STRONGYLOCENTROTUS PURPURATUS
PURPLE SEA URCHIN
TROPHIC LEVEL: (3) CARNIVORE
INVERTEBRATES

ACHAEA LIMATULA
FILE LIMPET
ANTIPLANES PERSERSA
SNAIL
ASTROPECTIN ARMATUS
SAND STAR
BORETROPHON SYLVARTI
SNAIL
BUCCINUM STRIGILLATUM
SNAIL
CALLIOSTOMA ANHULATUM
SNAIL
CROSSASTER PAPOSUS
ROSE STAR
DERMASTIAS NERICATA
LEATHER STAR
EVASTERIAS TOSCHELI
SEA STAR
FUSITRITON OREGONENSIS
OREGON TRITON
HENCIRIA LEVISCURA
BLOOD STAR
LISHKEIA CIDARIS
SNAIL
LUDIA FOLIATA
SAND STAR
NITRELLA GOULDII
SNAIL
NASASSIUS FOSSATUS
SNAIL
NASASSIUS MENDICUS
SNAIL
NASASSIUS MENDICUS
SNAIL
PISASTER BREVISPINEUS
SHORT-SPINED PISASTER
PISASTER GIANT
PISTARIA OCTIRACEOUS
PURPLE STAR
PSTER TESSELATUS ARCATUS
SLIME STAR
PUNCTURELLA CINVULATA
LIMPET
PYCNOPODIUM HELIOLMIDES
SUNFLOWER STAR
SCYRA ACUTIFRONS
MASCING CRAB
SOLASTER DARWINI
NORTHERN SUN STAR
SOLASTER STIMPSONI
SUM STAR
TROPHIC LEVEL: (3) CARNIVORE
FISHES

BRACHIISTUS FRENATUS
KELP PERCH
HEKAHAKOS DECAHAKOS
KELP GREENLING
HEKAHAKOS STELLERI
WHITETOPED GREENLING
OPHIDIUM ELEGANTUS
LINGCOD
SCORPENICHTYS MARMORATUS
CEBIZON
SEBASTES CAURINUS
COOPER ROCKFISH
SEBASTES MALICER
QUILLBACK ROCKFISH
SEBASTES MYSTICUS
BLUE ROCKFISH
SEBASTIDIIES MELANOPIES
BIRKEN RED SEA BASS
SOLASUS ACANTHIS
SPIKY DOGFISH
TROPHIC LEVEL: (3) CARNIVORE
HAMULAX

ENHYDIUS LUTRIS
SEA OTTER
EUROPTOPIAS JUBATUS
Northern or Stellar Sea Lion
PHOCALIUS VITULINA
HARBOUR SEAL
ZALOPHUS CALIFORNICUS
CALIFORNIA SEA LION
TROPHIC LEVEL: (4) DETRITIVE
INVERTEBRATES

HANK'S SETACEA
SNAKED
PARKIODUS CALIFORNICUS
GIANT RED SEA CUCUMER
MYOHAGA WASHINGTONA
WASHINGTON WOODEATER
TROPHIC LEVEL: (5) OMNIVORE
INVERTEBRATES

ANPHIDIA VERSICOLOR
SNAIL
DENIFITIATA
SNAIL
UNKODECIA
BRYOZOAN
TROPHIC LEVEL: (7) FILTER FEEDER
INVERTEBRATES

BALANUS CRETATUS
BAR IAACLE
BULLA FLABELLA
BRYOZOAN
CELLAIA MANDIBULATA
BRYOZOAN
CLETIARIUM KUTATII
BRYOZOAN
CELSEIUM PUNCTULATA
BRYOZOAN
HEDERACTIDUM CENTRIFILUM
HUNDRED-LINED COCKLE
PECTIN CAURIUS
HABITAT: KELP FORESTS VEGETATED BENTHIC

GIANT PACIFIC SCALLOP
PSOLUS SQUAMATUS
SEA CUCUMBER
SAXICAVA ARCTICA
ARCTIC SAXICAVE CLAM
TEREBRATALIA TRANSVERSA
LAMP SHELL

TROPHIC LEVEL: (8) SCAVENGER
INVERTEBRATES

PHYLLOLITHOIDES PAPillosus
PAPILLA CRAB

TROPHIC LEVEL: (9) INVERTEBRATE
EATER - INVERTEBRATES

BALAMOPHYLLA ELEGANS
STONY CORAL
NEPHTYS LONGOSETOSA
POLYCHAETE
PANDALUS DAMAE
DOCK SHRIMP

TROPHIC LEVEL (9) INVERTEBRATE
EATER - FISHES

CLUPEA HARENGUS PALLASI
PACIFIC HERRING
CYNAMATCHER AGGREGATA
SHINER PERCH
EMBIOIOTCA LATERALIS
STRIPED SEAPERCH
LEPTOCOTTUS ARMATUS
PACIFIC STAGHORN SCULPIN

TROPHIC LEVEL: (9)
INVERTEBRATES

ABIEITINARIA
HYDROID
ABIEITINARIA ABIEFINA
HYDROID
ABIEITINARIA ALEXANDERI
HYDROID
ABIEITINARIA TRASKI
HYDROID
ACRYPTOLARIA
HYDROID
AGLAOPHEHIA
HYDROID
AGLAOPHEHIA DIEGEMSI
HYDROID
AGLAOPHEHIA INCONSPICUA
HYDROID
AGLAOPHEHIA OCTOCARPIS
HYDROID
ALLOPORA VERRILLI
HYDROCORAL
CAMPANULARIA
HYDROID
CAMPANULARIA VERTICILLATA
HYDROID
CAMPANULARIA VOLUBILIS
HYDROID
HABLELUM CORRUGATUM
HYDROID
LAFUEA ADMATA
HYDROID
LAFUEA DUMOSA
HYDROID
LAFUEA FRUTICOSA
HYDROID
LAFUEA GRACILLIMA
HYDROID
MEDIASTER AEGUALIS
VERMILLON STAR
PLUMULARIA ALICIA
HYDROID
PUGETIJA ARACILLIS
SERTULARELLA TURGINA
HYDROID
THUIARA ROBUSTA
HYDROID
THUIARA ROBUSTA
HABITAT: SURFGRASS VEGETATED BENTIC

TROPHIC LEVEL: (1) PRODUCER

Plants

- Ahnfeltia concinna
- Ahnfeltia plicata
- Ahnfeltia plumosa
- Alaria marginata
- Anthoceros pseudodichotoma
- Calliarthron regenerans
- Calliarthron schmittii
- Callophyllis edentata
- Ceramium californicum
- Cystoseira menziesii
- Egregia menziesii
- Erythrophylax delesserioides
- Gracilaria californica
- Gracilaria nigrofuscava
- Grateloupia californica
- Gymnogongrus platyphyllus
- Hymenecia flabelligera
- Hymenecia setchellii
- Iridaea cordata
- Laminaria groenlandica
- Laminaria saccharina
- Laurencia spectabilis
- Macroystis integrigolia
- Nebranoptera platyphylla
- Microcladia cotleri
- Opuntia californica
- Phyllospadix scouleri
- Pterosiphonia bipinnata
- Pterogorgia californica
- Pilota asplenioides
- Heterosolen latissimum
- Heterosolen pallata
- Heterosolen pertusa
- Heterosolen plumosum
- Sargassum muticum
- Achaea mitra
- Bunchea limpet
- Strongylocentrotus franciscanus
- Giant red urchin
- Strongylocentrotus purpuratus
- Purple sea urchin

TROPHIC LEVEL: (2) HERBIVORE

Invertebrates

- Bugula flavescens
- Calliactis plumose
- Litorina candidula
- Linkia arcuatula
- Littorina rubens
- Lophelia pertusa
- Anemone
- Clavularia
- Pteroidium angula

TROPHIC LEVEL: (3) CARNIVORE

Invertebrates

- Bugula cervicornis
- Callopora transversa
- Terebratula transversa
- Laminaria

TROPHIC LEVEL: (4) DETRITIVORE

Invertebrates

- Bankia setacea
- Teredo navalis
- Parastichopus californicus
- Xylocopa washingtoniae

TROPHIC LEVEL: (5) OMNIVORE

Invertebrates

- Amphissa versicolor
- Coelenterata

TROPHIC LEVEL: (6) FILTER FEEDER

Invertebrates

- Bugula flabellata
- Cellula nannichilata
- Cribellum californicum
- Giant Pacific scallop

TROPHIC LEVEL: (7) SCAVENGER

Invertebrates

- Acanthaster planci
HABITAT: SURFGRASS VEGETATED BENTHIC

PHYLLOLITHOIDES PAPILLOSUS
PAPILLA CRAB

TROPHIC LEVEL: (Q)
INVERTEBRATES

ABIETINARIA
HYDROID
ABIETINARIA ABIEITINA
HYDROID
ABIETINARIA ALEXANDERI
HYDROID
ABIETINARIA TRASKI
HYDROID
ACRYPTOLARIA
HYDROID
AGLAOPHENIA
HYDROID
AGLAOPHENIA D'IEGENSIS
HYDROID
AGLAOPHENIA INCONSPICUA
HYDROID
AGLAOPHENIA OCTOCARPA
HYDROID
CAMPANULARIA
HYDROID
CAMPANULARIA VERTICILLATA
HYDROID
CAMPANULARIA VOLUBILIS
HYDROID
HALECIUM CORRUGATUM
HYDROID
LAFOEA ADNATA
HYDROID
LAFOEA DUMOSA
HYDROID
LAFOEA FRUTICOSA
HYDROID
LAFOEA GRACILLIMA
HYDROID
MEDIASTER AEQUALIS
VERMILLON STAR
PLUMULARIA ALICIA
HYDROID
SERTULARELLA TURGIDA
HYDROID
THUJARA ROBUSTA
HYDROID
HABITAT: SURFGRASS VEGETATED BENTHIC
APPENDIX G: INVERTEBRATE SPECIES IN THE COASTAL AREAS OF THE OLYMPIC NATIONAL PARK
Invertebrate Species in the Coastal Areas of the Olympic National Park
Prionitis lanceolata
Prionitis lyallii
Prionitis filiformis
Erythrophylhum delesslerioides
Schizymenia pacifica
Mastocarpus jardini
Mastocarpus papillatus
"Petrocelis"
Peyssonnelia pacifica
Ahnfeltia gigartinoides
Ahnfeltia plicata
Gymnogongrus chiton
Gymnogongrus linearis
Plocamium cartilagineum
Plocamium tenue

Order Rhodymeniales
Gastroocladium
subartculatum

Fauchea laciniata
Rhodymenia californica
Order Ceramiales
Callithamnion pikeanum
Ceramium pacificum
Ceramium washingtoniense
Griffithsia pacifica
Microcladia borealis
Microcladia coulteri
Ptilota asplenioides
Ptilota hypnoides
Cryptopleura ruprechtiana
Cryptopleura lobulifera
Cryptopleura violacea
Deciella decipiens
Polyneuropsis latissima
Polyneuropsis stolonifera
Laurencia spectabilis
Neoaulia larix
Odonthalia washingtoniensis
Polysiphonia hendryi
Polysiphonia pacifica

LICHENS
Verrucaria spp.
Arthopyrenia halodytes

ANIMALS
PH. PORIFERA (SPONGES)
Leucosolenia sp.
Halichondria panicea
Ophiltaspongia pennata
Haliclona spp.
Leptasterias hexactis
Pynopodia helianthoides
Henricia leviuscula
Evasterias troschelii

BRITTLE STARS

Amphipholis squamata

PH. UROCHORDATA: TUNICATES

Styela spp.
Perophora annectens
Metandrocarpa sp.
Clavelina huntsmani
Aplidium spp.
Didemnum sp.

VERTEBRATES: FISHES

Gobies
Blennies
Cottids (sculpins)
APPENDIX H: NAVY ANALYSIS OF ALTERNATIVES TO SEALION ROCK
Navy Analysis of Alternatives to Sealion Rock
From: Commander, Medium Attack Tactical Electronic Warfare Wing, U.S. Pacific Fleet
To: Commander in Chief, U.S. Pacific Fleet
Via: Commander, Naval Air Force, U.S. Pacific Fleet

Subj: SEA LION ROCK

Ref: (a) P.L. 91-504, 84 STAT 1104
(b) 16 U.S.C. 1132
(c) COMNAVVAQWINGPAC ltr ser 016/3778 of 24 Dec 1990
(d) P.L. 100-627, 102 STAT 3217
(e) 16 U.S.C. 1401
(f) 16 U.S.C. 1362
(g) 16 U.S.C. 1372
(h) 16 U.S.C. 1531 et. seq.
(i) 16 U.S.C. 1536 (2)
(j) 16 U.S.C. 701 et. seq.

Encl: (1) Alternatives to Sea Lion Rock (R-6707)
(2) 1986-1990 Scheduling of Sea Lion Rock
(3) COMNAVAIRPAC ltr 5800 ser 011/7040 of 31 Aug 1989
(4) NOAA ltr (Tippie ltr) dtd 8 April 1990
(5) Draft Marine Mammal ltr (Twiss ltr) undated
(6) USFWS ltr (Martin ltr) dtd 9 April 1990

1. In the last several months, it has become increasingly apparent that the Navy's use of Sea Lion Rock will be challenged by both other federal agencies and environmentalists. As the only sea-based bombing target in the Pacific Northwest, Sea Lion Rock is considered an important training option for current and future Navy requirements.

2. SEA LION ROCK. Sea Lion Rock is an exposed reef of rock approximately 60 feet long and 30 feet wide and is located slightly more than three miles off the coast of Washington. Awash at high tide, Sea Lion Rock has no soil or vegetation and is not used by sea birds for nesting or egg laying. Despite its name (a misnomer), Sea Lion Rock is only used by sea lions and harbor seals as an occasional haul out site for resting. No sea lions live on the rock. During a period of observation from 1984 to 1985, no sea lions and only sporadically, harbor seals were observed on Sea Lion Rock.
Subj: SEA LION ROCK

18. ALTERNATIVES TO SEA LION ROCK. During discussions over the last two years, USFWS has proposed several possible alternatives to Sea Lion Rock. USFWS readily concedes that this is the Navy's only sea based target in the Northern Pacific. In addition, they acknowledge that there are no other rocks which could be used for the same purpose. Instead, USFWS suggested certain alternatives which we rejected as infeasible for financial, practical, environmental and scheduling reasons. These alternatives included towed targets, floating targets (including moored targets), cut-of-area training and simulation (including cockpit simulation). Enclosure (1) was presented to USFWS as our opposition but they have persisted to state that we have not given serious consideration to these alternatives. On the contrary, these suggestions were seriously considered, but do not warrant more detailed and costly study.

19. OTHER ENVIRONMENTAL ISSUES. Continued use of Sea Lion Rock by naval aircraft as a bombing target will depend upon not only the outcome of the current negotiations with USFWS but will be affected and influenced by several other environmental issues. These issues are discussed below.

20. By reference (d), Congress directed the Secretary of Commerce to designate an area off the coast of western Washington as a National Marine Sanctuary. Sea Lion Rock is located within the area now being referred to as the Olympic National Marine Sanctuary. To date, the National Oceanic and Atmosphere Administration (NOAA) has submitted a preliminary draft Management Plan to concerned agencies, including the Navy. The proposed prohibitions would appear to ban the bombing of Sea Lion Rock. Other Navy activities which may or may not be affected by the designation are described in enclosure (3). Currently, the proposed management plan is being reviewed by OP-4EPI (POC: Mr. Tom Reeling), and Office of the Assistant Secretary of the Navy (I&SE) (POC: Cdr Tim Schnoor), and Office of the General Counsel, (POC: Capt R. M. Mollison). It should be noted that in April 1999, by enclosure (4), NOAA expressed concern about Navy's use of Sea Lion Rock.

21. The Marine Mammal Commission established by reference (e) has also recently raised questions concerning the Navy's use of Sea Lion Rock. In an unsigned draft of a letter addressed to Assistant Secretary of the Navy (I&SE), Jacqueline F. Schafer,
REQUIREMENTS

The U.S. Navy has the requirement for a readily accessible target for use with practice and heavy inert ordnance, near or within the confines of a Warning area or Military Operating Area (MOA), so as to accomplish multiple mission training. The primary training to be conducted in this area is as follows:

- War at Sea exercises;
- Heavy ordnance carriage and release; and
- Multiple aircraft tactical maneuvering.

In addition, this target will serve as the primary alternate target for routine weapons delivery training when the Navy's primary instrumented target (NTRF BOARDMAN, OREGON) is not usable. In this regard, historical data for NTRF Boardman indicates that the target is closed on an average of six days per month due to maintenance, upkeep and training, and 3 days per month due to weather conditions such as high winds, fog and snow. Closure of NTRF BOARDMAN due to fog is more frequent during the Summer.

Training requirements for aircrews of Naval Air Station, Whidbey Island, require a year round alternative to NTRF BOARDMAN. Delays in bombing training when squadrons are preparing for carrier deployments have a direct adverse impact on military
readiness. Due to operating requirements and schedules, carrier based aircrews have even less flexibility in scheduling bombing practice.

CURRENT CAPABILITIES:

Sea Lion Rock is an unmanned target located off the West coast of Washington. Approximately 17 NM North of Pacific Beach, Washington, and 85 NM from Naval Air Station, Whidbey Island. Scheduling of Sea Lion Rock is controlled by the Operations Office, Commander Medium Attack Tactical Electronic Warfare Wing, U.S. Pacific Fleet, with at least two and one half hours advance notice. The rock is located within the confines of R-6707 and within the Olympic MOA, to the East and contiguous with Warning Area W-237A. Sea Lion Rock is the western-most rock offshore in the area. It is approximately 80 feet long by 30 feet wide, and at high tide it is either submerged or awash.

POSSIBLE ALTERNATIVES:

Towed targets: Navy aircraft have used ship towed targets while operating at sea in the vicinity of surface combatants. These targets are pontoon mounted, rigid structures, approximately 15 feet long, which are towed 1000 to 1500 feet behind a host ship. Utilization of a towed target in the outer coast of the Pacific Northwest would require a minimum of 30 days advance
notice to task a dedicated surface vessel. Storing the target on the outer coast would reduce the time required, but a considerable time would still be required, several days to over a week, to arrange for a towing craft from the Puget Sound area, for it to transit to the area, and for it to prepare and tow the target. Scheduling would depend on the availability and operating requirements of surface vessels. The lack of predictability and flexibility in scheduling a towed target would preclude the use of this alternative as a viable training target and as a weather backup for NTRF BOARDMAN. This need for a readily available alternative to Boardman and a sea based target is a year round requirement. The lack of predictability and reliability in utilizing a towed target precludes its use, even on a seasonal basis. Although conceivably carriers could carry and tow targets, carrier operating requirements, including the launching and recovery of aircraft, preclude this as a reliable training option.

Floating targets: This alternative would require the preparation and mooring of a target barge in the Pacific Ocean off the coast of Washington, within the confines of W-237A. Deep water mooring of a barge would require that it be able to withstand the heavy seas and storms of this area. It would not be feasible to moor such a barge year round as the hazard to navigation and the danger to the environment should the barge break free of its moorage would be too great. Instead a tug would be required to tow the barge to its target location. At least two
to three days would be required for the target barge to be towed and moored. The initial and recurring costs would be substantial. At a minimum the estimated costs would entail the following:

- Preparation of a target barge $50,000.00
- Installation of Deep Water Mooring $250,000.00
- Environmental documentation $50,000.00
- Towing ($9000 to $10,000 per day) $60,000.00 (recurring)

-TOTAL COST OF A SINGLE MOORAGE $410,000.00

A moored target is not considered feasible. Besides the considerable cost, the very real possibility that the barge could break free of its mooring presents an unacceptable risk to navigation and the environment. A moored target vessel used off the Pacific Missile Test Center, Point Mugu, California, broke free of its mooring became a hazard to navigation, and cost in excess of 3 million dollars to remove from San Miguel Island where it had washed ashore.

A buoy-sized target has been suggested, but is also not an acceptable alternative. While the costs would be substantially less, the size would render it an unsuitable target. Target location, bombing and bomb scoring would be unworkable. In addition, a successful bomb strike could either sink the target or break it free of its mooring, presenting a hazard to
navigation. Finally, buoys and similar moored and marked objects in navigable waters would be used as a reference point by fishermen.

Other target rocks: Based on the Navy's review of the area and discussion with U.S. Fish and Wildlife Service representatives, no other rocks so ideally suited for a target have been located off the Western Coast of Washington. The location of the rock relative to Naval Air Station, Whidbey Island, its distance from the coast and populated areas, and the fact that Sea Lion Rock is not used by marine mammals or sea birds for breeding and nesting, are factors in combination not characteristic of any other rock in the area.

Simulation: A Weapons System Training flight simulator is available for A-6 aircrew training at Naval Air Station, Whidbey Island. Although this simulator is used for basic weapons delivery procedures, it cannot be used for multi-plane, tactical maneuvering or coordinated target timing. Use of computer generated technology will not simulate the actual conditions of bomb carriage and release, such as 'G's' and aircraft handling associated with heavy ordnance. The current system is too old to be updated and no new A-6 trainer is planned as the plane itself will be phased out over the next 15 years. In addition, flight simulation is only one portion of the training required for aircrew bombing proficiency. To adequately train an aircrew, it is
necessary to actually drop bombs from the airplanes. Even target simulation in an A-6. If the technology existed in the A-6 which it does not, would fail to train the crew for the real life scenario of dropping bombs on target. Moreover, cockpit bombing simulation in an A-6 would still require a real target, and would not obviate the need for Sea Lion Rock.

Out of area training and targets: The fundamental need is for a target to be used by Whidbey Island based aircrews. To integrate over the sea bombing training with all other phases of aircrew training, a target within the range of the A-6 must be available. When Whidbey based aircrews are deployed to other areas such as Southern California, they do use the targets available in that operating area. Such training is limited, by the availability of these targets and higher priority Battle Group training commitments that can only be accomplished in these areas.

CONCLUSION

The Navy must have access to Sea Lion Rock on a continuing basis for over the sea bombing practice.
Mr. Richard Smith  
Deputy Director  
U.S. Fish and Wildlife Service  
Department of Interior  
Washington, D.C. 20240

Dear Mr. Smith:

We were pleased to meet with you on 3 March 1992 to discuss the Department of the Navy’s (DoN) use of Sea Lion Rock within Copalis National Wildlife Refuge as an inert bombing target. As explained below, the DoN believes that the public interest is best served by allowing continued use of Sea Lion rock for training vital to the national defense pursuant to the existing letter of permission from the Secretary of the Interior. The careful studies already conducted do not reveal any significant impact. There is simply no site specific evidence that the DoN activities have materially impaired the purposes of the refuge. Although we expect that both the DoN and the U.S. Fish and Wildlife Service will continue to monitor the situation carefully, we do not believe any change to the existing letter of permission is required at this time.

A DoN review conducted as a result of our meeting concludes that Sea Lion Rock remains an essential training asset because it is the only inert bombing target off the Northwest Coast available when conditions at land-based targets are unfavorable or when a sea-based target is required. To aircrews, the closer the training approaches the mission requirements under actual conditions, the higher the quality of training. Training requirements for A-6 aircrews include practice weapons deliveries against sea-based targets, consisting of coordinated strikes against ships or task groups. Using Sea Lion Rock as a target, aircraft operating in coordination can attack an actual sea-based fixed object. Thus, aircrews are able to experience approaching a sea-based target and releasing ordnance under ocean wind/weather conditions and water/land contrast.

Sea Lion Rock also serves as a land-based backup target when Naval Weapons System Training Facility (NWSTF) Boardman is not available, providing a readily accessible target within range of aircraft taking off from Naval Air Station (NAS) Whidbey Island. NWSTF Boardman is unavailable an average of nine days per month due to weather or other conditions. Sea Lion Rock, as an alternate target, allows aircrews to complete training of a particular evolution within a limited period of time. In times of national crisis when the tempo of deployment training increases and adhering to schedules becomes even more critical, a backup target becomes invaluable.
The unique location of Sea Lion Rock along the Northwest Coast permits ideal bombing practice involving evasion tactics training because of its proximity to Warning Area W-237A and the Olympic Military Operating Area (MOA). Aircraft can release their inert weapons and, before returning to NAS Whidbey Island, engage in defensive air combat maneuvering critical to survivability. The airspace required for such training is not available at NWSTF Boardman, but is available at Sea Lion Rock within the Olympic MOA. Sea Lion Rock is also ideally situated for aircraft carriers conducting training in the waters off the Northwest Coast. NWSTF Boardman usually is not within range of the embarked aircraft, however, Sea Lion Rock is available within the cyclic flight operations schedule of the aircraft carrier with no requirement for inflight refueling or Federal Aviation Administration interface. The importance of Sea Lion Rock is further enhanced by the homeporting of the USS NIMITZ in the Pacific Northwest and the likelihood that fleet operations will continue to require a sea based target.

Efforts have been made to investigate alternative bombing options, including the use of towed targets, floating targets (barges and buoys), smoke floats, small reflector targets, other target rocks, simulation, and out of area training and targets. These alternatives are not feasible because of logistics and/or cost constraints. As budget reductions become greater, the cost of maintaining and operating alternate portable targets becomes very important.

Sea Lion Rock is part of a diminishing supply of assets available for DoN training. If Sea Lion Rock is given up outright or its use so limited that it is essentially forfeited, the training opportunities it provides will be forever lost.

The DoN shares your concerns over protection of the refuge. We believe, however, that the results of the 1984-85 study conducted by the Washington Department of Game for DoN supports our conclusion that A-6 aircraft operations, conducted according to the Operations Plan, do not significantly impact the resources associated with Sea Lion Rock. The DoN will continue to ensure compliance with the Operations Plan and is exploring additional measures to ensure compliance. I have requested that personnel at NAS Whidbey Island meet with representatives of your regional office at their request to discuss these additional measures. The DoN point of contact is Commander J.J. Stonier at 206/257-2470. We look forward to working together to solve our mutual concerns.

Sincerely,

JACQUELINE E. SCHAFER
APPENDIX I: SANCTUARY DESIGNATION PROCESS
Sanctuary Development Process

FOUNDATION FOR ACTION
- Public Support (local, regional, national)
- State/Federal Initiative
- Congressional Initiative

PLANNING/PRELIMINARY DEVELOPMENT
- Coordination with Local, State & Federal Management Authorities
- Working Groups/Committees

INFORMATION GATHERING
- Data Collection
- Information Forums/Symposiums
- Targeted Interviews
- Outreach Sessions

Draft Environmental Impact Statement and Management Plan
- Content:
  - Executive Summary
  - Affected Environment
  - Management Alternatives
  - Environmental Consequences
  - Preferred Alternative
  - Action Plan
  - Cost Projections
- 60-day Public/Agency Comment Period
- Comments Reviewed and Incorporated into FEIS

Final Environmental Impact Statement and Management Plan
- Content:
  - Executive Summary
  - Affected Environment
  - Management Alternatives
  - Environmental Consequences
  - Preferred Alternative
  - Action Plan
  - Cost Projections
- 30-day Public/Agency Review Period
- Final Public, State and Federal Review

SANCTUARY DESIGNATION
- Congress and Governor of Affected State Have 45-days of Continuous Session of Congress to Review the Terms of Designation

IMPLEMENTATION OF MANAGEMENT PLAN AND REGULATIONS
- Continued Public Input
- Advisory Committee/Working Groups
- Interagency Coordination
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I. INTRODUCTION

Presented below is an overview of various State, Federal, Tribal and international management authorities which have statutory responsibility for protecting marine resources in the Olympic Coast National Marine Sanctuary study area. This discussion includes a description of relevant legislative mandates and, in some cases, the administrative measures taken to accomplish them (Some additional information is provided in the FEIS/MP).

II. STATE JURISDICTION

A. State Statutes

1. The Aquatic Lands Act (ALA, RCW 79.90) provides the policies under which the Department of Natural Resources manages all state-owned aquatic lands, emphasizing a balance of benefits to all state citizens, water-dependent uses, and environmental concerns. ALA establishes the multiple use concept, which provides for several uses, either simultaneously or in planned rotation, on a single tract of aquatic land. The Act governs sales and leases of state aquatic lands, aquaculture, property rights and easements, administration of tidelands and harbor areas, rents and fees, dredge disposal, and archaeological research.

2. The Clean Air Washington Act (CAWA, RCW 70.94) declares that air pollution is the state’s most serious environmental problem. The Act establishes a statewide program (1) to prevent the deterioration of air quality in areas with clean air and (2) to return the air quality in other areas to levels that protect human health and the environment. In some respects, CAWA is more stringent than the federal Clean Air Act. A State Air Pollution Control Board and Local Air Pollution Control Authorities are established and, together with the Department of Ecology, are empowered to regulate activities such as outdoor burning (of any kind), industrial emissions, commercial/residential burning, and motor vehicle emissions. This is a broad-ranging act that extends state jurisdiction over such coastal activities as offshore oil production emissions, slash burning in coastal areas, controlled burns of marine oil spills, at-sea incineration, concentrated vessel emissions, coastal industrial emissions, etc. The act also assures protection of scenic, aesthetic, and cultural aspects of the natural environment, including marine vistas, that are threatened by air pollution.
3. The **Energy Facility Siting Act** (EFS, RCW 80.50) creates and authorizes the Energy Facility Site Evaluation Council, a quasi-judicial regulatory body. The council serves as a one-stop agency for permitting major energy facilities within the state. This act would also pertain to energy facilities in the coastal zone and potential discharges from those facilities into the air and marine environments. Legislative policy states a desire to protect the ecology of state waters and their aquatic life through responsible site planning.

4. The **Environmental Coordination Procedures Act** (ECPA, RCW 90.62) establishes a procedural option to reduce the burden and confusion associated with multiple environmental permit requirements for certain private or corporate project proposals. It directs the Department of Ecology to develop and administer a "master application" process and, upon applicant request, coordinate all permit requirements for any project affecting the state's air, land or water resources. This, in effect, provides permit applicants the opportunity for one-stop-shopping. The Act also requires DOE and all county governments to establish environmental permit information centers (EPICs) to provide information to the public regarding federal, state, and local permits which govern the use of natural resources and to assist applicants in the preparation of master applications. Note: No applicant has filed a master application since the early 1980s because the changing nature of most project proposals complicates and nullifies efforts to coordinate permit procedures.

5. The **Fisheries Code** (RCW 75) provides management guidelines for food fish and shellfish and authorizes the Department of Fisheries (WDF) to protect and manage recreational and commercial salt-water fisheries. The Act also authorizes the Department of Fisheries, jointly with the Department of Wildlife (WDW), to administer the **Hydraulic Code** (RCW 75.20), requiring that construction projects in state waters obtain a permit from either WDF or WDW to ensure protection of fish, shellfish, and wildlife resources of the state.

6. The **Growth Management Act** (GMA, RCW 36.70A) mandates coordinated and comprehensive land-use planning by municipalities and counties to provide for future growth and protect air and water quality. One planning goal of the act is to maintain and enhance natural resource-based industries, including fisheries. Each coastal community must include in its comprehensive land use plan provisions for the preservation and conservation of coastal resources and water quality.

7. The **Hazardous Waste Management Act** (HWMA, RCW 70.105) establishes a comprehensive state-wide framework for the planning, regulation, control, and management of hazardous waste [to] prevent land, air, and water pollution and conserve the
natural, economic, and energy resources of the state." HWMA grants broad powers of regulation to the Department of Ecology in matters related to hazardous waste regulation, management and disposal. The Act also gives DOE "preemptive authority" for the siting of hazardous waste treatment, storage, disposal, and incineration facilities. This law affects the 3-mile offshore jurisdiction of the state and regulates any activities that introduce hazardous materials into that area.

8. The Marine Recreation Land Act (MRLA, RCW 43.99) allocates funds from the state marine fuel tax assessment for the acquisition and improvement of marine recreational land and for the preservation and conservation of open space in the coastal zone.

9. The Noise Control Act (NCA, RCW 70.107) authorizes the Department of Ecology to establish maximum permissible noise levels for identified environments "in order to protect against adverse effects of noise on the health, safety and welfare of the people, the value of property, and the quality of environment." DOE can implement performance standards, evaluation criteria, and rules to carry out this chapter. The department can also establish use standards, regulating the time and place of occurrence for an operation that produces noise above specified levels.

10. The Ocean Resources Management Act (ORMA, RCW 43.143) recognizes conflicting use demands in Washington marine waters and directs that "priority shall be given to resource uses and activities that will not adversely impact renewable resources over uses which are likely to have an adverse impact on renewable resources." ORMA establishes planning and project review criteria to evaluate uses and activities that adversely impact renewable resources and associated industries in coastal waters. The Act further states that "there is not enough information available to adequately assess the potential adverse effects of oil and gas exploration and production off Washington's coast." In accordance with this finding, it directs the Department of Ecology (DOE) to produce an oil and gas leasing analysis and places a moratorium on the leasing of state marine lands for oil or gas activities until July 1, 1995. At that time the Legislature will decide whether to continue or terminate the moratorium based on the analysis provided by DOE. Other provisions of the Act are codified in the Revised Code of Washington (RCW) as follows:

Transport of Petroleum Products - Financial Responsibility (RCW 88.40) prescribes financial responsibility requirements for vessels that transport petroleum products across the waters of the state." Oil cargo vessels exceeding 300 gross tons must provide evidence to the Department of Ecology of financial liability and responsibility for a potential spill in the marine waters of the state.
11. The Oil and Gas Conservation Act (OGCA, RCW 78.52) provides for extensive regulation of oil and gas drilling, production, storage, transportation and refining operations within Washington State. The Act requires preparation of an environmental impact statement (EIS) for any proposed drilling operation through or under any surface waters of the state. The Department of Ecology is directed to review EIS documentation and submit recommendations for approval or denial of drilling permits to the Oil and Gas Conservation Committee.

12. The Oil and Hazardous Substance Spill Prevention and Response Act (RCW 90.56) superceded and consolidated previous legislation concerning oil spill prevention and response. It also expanded state authority over spill prevention and response and granted additional powers to the Department of Ecology to enforce the provisions of this act. The provisions of the Act are codified in the Revised Code of Washington (RCW) as follows:

Oil and Hazardous Substance Spill Prevention and Response (RCW 90.56) This chapter includes the major themes and core provisions of the original Act. It is based on the Legislature's determination that prevention is the best method to protect the marine environment from oil and hazardous substance spills. In order to establish a comprehensive prevention and response program to protect the state's waters and natural resources from spills of oil, the chapter (a) provides broad powers to the Department of Ecology relating to spill prevention and response; (b) supports and compliments the federal Oil Pollution Act; (c) requires the development, adoption, and execution of a state-wide master spill prevention and contingency plan; (d) requires spill prevention and contingency plans from oil storage and transfer facility operators; (e) provides for state spill response and wildlife rescue planning and implementation; (f) ensures that responsible parties are liable and have the resources and ability to respond to spills and provide compensation for all costs and damages; (g) establishes the Oil Marine Oversight Board as an independent authority to assess adequacy of prevention and contingency planning; and (h) establishes a state oil spill response account.

Office of Marine Safety (RCW 43.21I) This chapter creates the Office of Marine Safety as a state agency to "provide leadership and coordination in identifying and resolving [a] threats to the safety of marine transportation and [b] the impact of marine transportation on the environment." The Office is to serve as a center for expertise in marine transportation issues.

Vessel Oil Spill Prevention and Response (RCW 88.46) This chapter assigns specific duties and powers to the Office of Marine Safety (OMS). It directs OMS (a) to establish a state tank vessel inspection program; (b) to establish and enforce standards for tank vessel spill prevention plans; (c) to establish and enforce rules and standards for the preparation of contingency plans concerning the containment and cleanup of oil spills from covered vessels (tank, cargo, and passenger vessels);
(d) to establish and supervise Regional Marine Safety Committees for the purpose of planning for the safe navigation and operation of all vessel traffic in state waters; (e) to develop an emergency response system for the Strait of Juan de Fuca and the Pacific Coast; and (f) to define requirements for containment and recovery equipment aboard tanker vessels and at refueling, bunkering, and lightering stations. The chapter abolishes the Office of Marine Safety effective July 1, 1997 and transfers all its powers, duties and functions to the Department of Ecology.

13. The Oil Spill Response System - Maritime Commission Act (RCW 88.44) creates the Washington State Maritime Commission to prepare comprehensive oil spill response plans for all state waters. The Act also requires the development of a data base from existing information sources of accidents, groundings, near misses, and oil discharges of all cargo and passenger vessels entering state waters and report such information to the Office of Marine Safety. The Commission is granted broad powers to make rules, and enter into contracts to assure a complete response in the first 24 hours following a spill event. The Commission is also given authority to assess vessels transiting the waters of the state, to collect such assessments, investigate violations, and enforce the provisions of the act.

14. The Planning Enabling Act (PEA, RCW 36.70) enables counties to form planning commissions and counties, cities and others to form regional planning commissions. Comprehensive planning and zoning requirements are established. Among the elements of the comprehensive plan are land use, circulation, conservation, recreation, transportation, and public services and facilities.

15. The Public Lands Act (PLA, RCW 79) authorizes the Commissioner of Public Lands to lease or not lease state-owned lands (including those within 3 miles of shore); the Act sets terms and conditions of leases, provides for conservation areas and natural area preserves, and defines property rights and governmental authority over tidelands and shorelands of the state. Within the Public Lands Title of the Revised Code of Washington (RCW 79) are sections governing oil and gas leases on state lands, natural area preserves, natural resources conservation areas, marine plastic debris, and aquatic lands.

16. The Puget Sound Water Quality Management Act (PSWQMA, RCW 90.70) restructured the Puget Sound Water Quality Authority (PSWQA - originally established in 1983) and directed it to develop and oversee a comprehensive plan for the restoration and protection of the biological health and diversity of Puget Sound waters. The Puget Sound Water Quality Management Plan primarily addresses issues that impact water quality. The scope of planning includes all the waters of Puget Sound north to
the Canadian border, the Strait of Juan de Fuca, and, to the extent that they affect water quality in Puget Sound, all waters flowing into the Sound, and adjacent lands. Lead state agencies and local governments are responsible for implementing individual plan components. These existing governmental authorities are required to evaluate and incorporate applicable provisions of the plan into their policies and activities. The Puget Sound Water Quality Board is responsible for setting goals and policy for the PSWQA. The Board is chaired by the Director of the Department of Ecology.

17. The Seashore Conservation Area law (RCW 43.51.650) declares all Washington Pacific Coast beaches (under state ownership or control) to be a conservation area for public recreation. The law restricts non-recreational uses of Pacific beaches and assigns priority consideration to preserving such areas in a natural condition. Recreation management plans are required for ocean beaches within the conservation area. The law is administered by the Washington State Parks and Recreation Commission.

18. The Shellfish Sanitary Control Act (RCW 69.30) instructs the State Board of Health to monitor the sanitation of shellfish growing areas, processing facilities and operations and to establish health requirements for the safe harvesting and processing of shellfish. The State Department of Health has authority to enforce the standards established by the Board and issues certificates of approval for all commercial growing, harvesting, and processing operations and facilities. The department has authority to revoke operating permits and close shellfish beds from harvest when it determines that unhealthy conditions exist.

19. The Shoreline Management Act (SMA, RCW 90.58) is administered by the Department of Ecology (DOE) and stands as benchmark legislation for the conservation of marine resources in Washington State. The Act provides a framework and a uniform set of rules to guide planning and management of human activities and development in the coastal zone. SMA emphasizes governmental protection in the management of state-owned aquatic lands, with a preference for long-term over short-term benefits. It applies from the shoreline seaward 3 miles and inland for 200 feet. Detailed zoning, implementation, and enforcement is a local governmental responsibility. Shoreline municipalities and counties develop local master plans that must be reviewed and approved by DOE. These plans are then incorporated into state law as components of the state Coastal Zone Management Plan. The Department of Ecology maintains supervisory authority and monitors permits issued by local governments. In 1983, the SMA was amended to provide DOE with authority for issuing permits for oil or natural gas exploration activities conducted from state marine waters. The SMA is an approved program under the federal
Coastal Zone Management Act and is therefore protected by federal consistency requirements (i.e., no federal activity can violate any provision of an approved shoreline master plan).

20. The State Environmental Policy Act (SEPA, RCW 43.21) requires that an environmental impact statement (EIS) be conducted for any proposed legislation or activity that has a probable, significant adverse impact upon the natural environment. The Act is intended to ensure that government makes informed environmental decisions before issuing approval for any project. It requires government agencies to "utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and decision making which may have an impact on [the] environment". The Act is binding on all state agencies and is usually administered and enforced through local governmental permit authorities such as city and county planning departments.

21. The Water Pollution Control Act (WPCA, RCW 90.48) designates the Department of Ecology as lead state agency for implementation of federal Clean Water Act provisions. DOE is given extensive rule-making and enforcement authority to control and prevent the pollution of all surface and underground waters of the state. The Act authorizes the department to (a) regulate various types of discharge (e.g. oil, chlorinated organics, and agricultural runoff); (b) issue waste disposal permits and regulate treatment facilities; (c) delineate and monitor sewage drainage basins; (d) issue water quality protection grants; and (f) regulate forest practices that affect water quality. The department is also authorized to recover damages for the destruction of any natural resource(s) due to violations of the Act. This act, together with the Puget Sound Water Quality Management Act and the federal Clean Water Act, form the basis of a comprehensive Water Quality Program at DOE.

22. The Wildlife Code (Also referred to as the Game Code, RCW 77) is the assimilation of all state laws that directly regulate fresh-water fisheries and upland wildlife resources in the State of Washington. WDW is given paramount responsibility by the Legislature "to preserve, protect, and perpetuate all wildlife species" in the state - both game and non-game. In addition to its primary authority over fresh-water fisheries, WDW regulates all non-game marine invertebrates (e.g. snails and barnacles) and some anadromous fish species. It is also the lead state agency with oversight responsibility for marine mammals. The Wildlife Code regulates fishing; hunting; trapping; transfer, transportation, and importation of game; sale of wildlife; and wild land and wildlife restoration. Section 16.120 of the code authorizes the State Wildlife Commission to extend special protection to individual fish and wildlife species. This section is the basis of authority for the state "Endangered" and
"Threatened" Species Lists. The Code also regulates tidelands used as public shooting grounds, protects bald eagles, and extends WDW enforcement jurisdiction throughout all marine areas of the state.

B. Landmark Judicial Decisions

1. United States v. State of Washington, 1974 (The Boldt Decision, 384 F. Supp. 312, 1974) was a landmark case in the State of Washington concerning the State's ability to condition or limit tribal fishing rights. This is an expansive and complex case. Several important supplemental judgments have been issued since the 1974 decision and, as of February 1993, forty subproceedings of this case were still outstanding. The original suit was filed by the United States, on its own behalf and as trustee for several Washington native tribes, against the State of Washington and others, seeking declaratory and injunctive relief concerning off-reservation treaty fishing rights. Judge Boldt (Senior District Judge of the US District Court, Western District of Washington) ruled that (1) Washington State has the legal authority to regulate the exercise of native tribes' off-reservation treaty right fishing only to the extent necessary for conservation of fishery resources, (2) any one of the plaintiff tribes was entitled to exercise its governmental powers by regulating the treaty right fishing of its members without any state regulation thereof, provided the tribe had and maintained certain specified qualifications and accepted and abided by certain delineated conditions, and (3) certain Washington statutes and regulations, delineated in the opinion, failed to meet the standards governing their applicability to the native exercise of treaty fishing rights and therefore could not lawfully be applied to restrict members of tribes having such rights from exercising same. A significant result of this case is the guarantee that treaty right fishermen may take up to 50% of the harvestable number of fish at usual and accustomed grounds and stations. (West's Federal Supplement)

C. Cooperative Agreements

1. The Crabber-Towboat Agreement, formally termed the "Towboat/Fishing Lane Negotiations," applies to most of the west coast of the United States. Due to mutual interference between West Coast crab fishermen and towboats with tows, a non-binding agreement was reached in 1971 to provide towing lanes for towboats along a major portion of the West Coast. Almost every year since, a meeting has been held to review these towboat lanes; some significant changes have been made.

The general agreement is that crab fishermen will not put crab pots in the designated lanes. If they choose to do so, they forfeit the right to complain if tugs and tows destroy their pots. The towboaters agree to stay within the designated lanes, or well outside the fishing areas, as long as weather and ship
safety allow. The facilitator of negotiations publishes and distributes a series of charts delineating the towboat lanes in the affected areas and issues revisions when negotiated changes are made. Regulatory authorities recognize the existence of this voluntary agreement and have elected not to regulate the activity as long as the two industries - fishing and towing - can resolve conflicts through mutual agreement.

Prior to 1990, negotiations were led by the Oregon State University Sea Grant Extension Program. In January 1990, the Northwest Towboat Association agreed to organize annual lane negotiation meetings and assume responsibility for chart production and distribution. The costs of the mutual agreement are shared by the towboat and crab fishing industries.

2. The Timber, Fish, and Wildlife Agreement (TFW) of 1987 was a non-binding mediated resource management plan between forest land owners, native tribes, natural resource management agencies, and environmental groups. Following passage of the Forest Practices Act of 1974 (RCW 76.09) by the Washington State Legislature, conflict over timber harvests escalated dramatically. TFW evolved to break the deadlock of litigation and conflict surrounding forest practices on non-federal land in Washington State. It has no formal or legal status, and thus depends on the good faith of the TFW cooperators and the adopted rules. The agreement establishes "interdisciplinary (ID) teams" to assess proposed timber harvest sites on a case-by-case basis to determine the harvest method and conditions that best minimize environmental, ecological, and cultural damage. Teams consist of resource managers, harvesters, biologists, and tribal representatives to develop integrated, balanced plans for each site. The Department of Natural Resources retains final authority for approving all harvest plans but coordinates with the ID teams to work out problems. TFW is designed to resolve such conflicts as clear cutting and over-siltation of rivers and estuaries. The agreement identifies and protects spawning areas, wildlife corridors and other sensitive habitat through land set-asides known as Riparian Management Zones and Upland Management Areas. It also contains a research component to investigate impacts of forest practices on the environment. TFW indirectly affects the marine zone through its impact on anadromous fisheries and through reduction of siltation in estuaries. The TFW Agreement has a stated lifetime of eight years, at which time the parties will assess the effectiveness of the program and decide whether or not to continue the agreement.

D. State Agencies and Local Authorities

1. Cities and Counties have primary responsibility for administering shorelines master programs and adopting other land use regulations. Counties and cities protect marine resources through shoreline development permitting; development of comprehensive growth management plans; and ordinances
regulating zoning, sensitive areas protection, grading and clearing, and drainage. In addition, local governments may use SEPA to protect wetlands and other sensitive areas.

2. **Department of Agriculture** coordinates aquaculture interests in the state.

3. **Department of Ecology** is the state's primary environmental agency to manage, protect, and enhance the state's air, land, and water resources. The responsibilities and opportunities for protecting habitat are legislatively mandated as well as delegated by the federal government. DOE administers permit programs under the Clean Water Act and the Clean Air Act. The Department has extensive authority in all matters concerning pollution and hazardous waste in the state and monitors the health and welfare of the state's natural resources. DOE also administers the Shoreline Management Program at the state level, conducts environmental research and investigations, and provides expert advice to the Governor and Legislature on environmental matters.

4. **Department of Fisheries** protects and manages the state's food fish and shellfish resources. Under that general authority, the Department manages major recreational and commercial marine fisheries and protects fishery habitat. WDF reviews all proposed construction plans in coastal waters for impacts to fisheries and fishery habitats and may approve, condition or deny such projects through the Hydraulics Permit program. The Department's Habitat Investigation Division is responsible for the pro-active assessment and protection of marine habitats critical to the marine fish resources of Washington. The Shellfish Program is responsible for management and protection of classified shellfish resources on public lands. WDF has a marine law enforcement division to assure compliance with the provisions of the state fisheries code.

5. **Department of Health** has authority over shellfish beds, processing, and distribution. The Department monitors shellfish beds for signs of contamination that pose a health risk to the public and has the authority to order closures when unsanitary conditions exist.

6. **Department of Natural Resources** manages most of the state's marine and upland property holdings. The properties are managed as a public trust. Marine lands are managed for maximum public benefit, while uplands are managed to provide revenue to the state's schools. The state owns approximately 11 square miles of harbor area, 140 square miles of shorelands, and 206 square miles of tidelands. The state also owns the beds of all navigable waters (marine lands below mean lower-low water to three miles offshore, and navigable lakes and rivers). DNR administers aquatic lands under a variety of programs. DNR is
authorized to issue leases, rights of way, and easements. It also may sell resources from aquatic lands.

7. **Department of Transportation**, Marine Division manages the state's ferry fleet. The director of the Marine Division also serves as chair of the State Board of Pilotage Commissioners which prescribes requirements for pilotage and licensing of marine pilots in Washington.

8. **Department of Wildlife** is given paramount responsibility by the Legislature "to preserve, protect, and perpetuate all wildlife species" in Washington State - both game and non-game. The Department has primary authority over freshwater fisheries, but also regulates all non-game marine invertebrates (e.g., snails and barnacles) and some anadromous fish species. It is also the lead state agency with oversight responsibility for marine mammals and administers a bald eagle protection program. WDW reviews the status of all wildlife species in Washington and selects certain species for special protection under state law by including them on state endangered and threatened species lists. The Department’s Habitat Administration Program maintains information bases on upland habitat, stream habitat, and critical habitat areas. WDW, together with the Department of Fishes, evaluates proposed water-side construction projects for impacts to fisheries habitats and grants, conditions or denies Hydraulics Permits based on its findings. The Department regulates fishing; hunting; trapping; transfer, transportation, and importation of wildlife; sale of wildlife; and wild land and wildlife restoration.

9. **Energy Facility Site Evaluation Council** includes representatives from 13 state agencies. The Council was created as a one-stop agency for permitting major energy facilities within the state. It is a formal regulatory body which acts as the lead agency for the state EIS process for energy facilities, conducts quasi-judicial reviews of project proposals, and makes formal recommendations for gubernatorial action on these matters.

10. **Office of Marine Safety** was created by the Legislature to "provide leadership and coordination in identifying and resolving threats to the safety of marine transportation and the impact of marine transportation on the environment." OMS is responsible for developing standards and programs for oil tank vessel inspection, maritime oil spill prevention and response, and safe transport of oil through Washington waters. The Office is to provide expert analysis of marine transportation issues to the executive and legislative branches of government.

11. **Parks and Recreation Commission** provides recreation opportunities for Washington citizens, preserves
natural heritage areas and conservation areas, and manages 104 developed park properties. The Commission manages several developed state parks in the coastal area for recreation and preservation and is the managing agency for the seashore conservation area - a recreation zone that protects the Pacific Coast beaches of Washington for public enjoyment. The agency has three divisions - Administrative Services, Operations, and Resources Development - which are responsible for land acquisition, park development, scenic rivers, and environmental protection programs.

12. Puget Sound Water Quality Authority was established by the Legislature to develop and oversee a comprehensive plan for the restoration and protection of the biological health and diversity of Puget Sound waters. The Authority also co-manages the Puget Sound Estuary Plan with the US Environmental Protection Agency. PWWQA's primary mandate is to collect data on the status of the inland waters of Washington, monitor water quality in the Sound and adjacent waters, to prepare a comprehensive plan to address water quality degradation from point source and non-point source emissions, to educate the public about threats to watersheds and the marine environment, and to coordinate with existing state, federal, and tribal authorities to implement and enforce the provisions of the comprehensive management plan for the Puget Sound Basin. The Director of the Department of Ecology chairs the Puget Sound Water Quality Board; however, the Authority maintains a great degree of autonomy

III. FEDERAL JURISDICTION

A. Federal Statutes

Like State authorities, Federal programs vary greatly in approach and scope, ranging from fairly broad-based legislation for resource conservation and environmental protection (e.g., The National Environmental Policy Act and Magnuson Fishery Conservation and Management Act) to regulation of specific activities and resources.

1. The Act to Prevent Pollution from Ships (APPS, 33 USC § 1901 et seq.) The International Convention for the Prevention of Pollution of the Sea by Oil, 1954, and the Oil Pollution Act of 1961 have been superseded by the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 Protocol relating thereto (MARPOL 73/78) and implemented by the Act to Prevent Pollution from Ships, 1980, as amended in 1982, 1987 (APPS). APPS, in implementing Annex I of MARPOL 73/78, regulates the discharge of oil and oily mixtures from seagoing ships, including oil tankers. APPS, in implementing Annex II of MARPOL 73/78, regulates the discharge of noxious liquid substances from seagoing ships. Enforcement of
the Act is the responsibility of the USCG.

When more than 12 nautical miles from the nearest land, any discharge of oil or oily mixtures into the sea from a ship subject to APPS other than an oil tanker or from machinery space bilges of an oil tanker subject to APPS is prohibited except when: 1) the oil or oily mixture does not originate from cargo pump room bilges; 2) the oil or oily mixture is not mixed with oil cargo residues; 3) the ship is not within a Special Area (the study area is not a Special Area for purposes of APPS); 4) the ship is proceeding en route; 5) the oil content of the effluent without dilution is less than 1000 parts per million (ppm); and 6) the ship has in operation oily-water separating equipment, a bilge monitor, bilge alarm or combination thereof (33 CFR 151.10(a)).

The restriction on discharges 12 nautical miles or less from the nearest land are more stringent. When within 12 nautical miles of the nearest land, any discharge of oil or oily mixtures into the sea from a ship other than an oil tanker or from machinery space bilges of an oil tanker is prohibited except when: 1) the oil or oily mixture does not originate from cargo pump room bilges; 2) the oil or oily mixture is not mixed with oil cargo residues; 3) the oil content of the effluent without dilution does not exceed 15 ppm; 4) the ship has in operation oily-water separating equipment, a bilge monitor, bilge alarm, or combination thereof; and 5) the oily-water separating equipment is equipped with a 15 ppm bilge alarm. NOTE: In the navigable waters of the U.S., the CWA, section 311(b)(3) and 40 CFR 110 govern all discharges of oil and oily mixtures (33 CFR 151.10(b)).

A tank vessel subject to APPS may not discharge an oily mixture into the sea from a cargo tank, slop tank or cargo pump bilge unless the vessel: 1) is more than 50 nautical miles from the nearest land; 2) is proceeding en route; 3) is discharging at an instantaneous rate of oil content not exceeding 60 liters per nautical mile; 4) is an existing vessel and the total quantity of oil discharged into the sea does not exceed 1/15,000 of the total quantity of the cargo that the discharge formed a part of (1/30,000 for new vessels); 5) discharges, with certain exceptions, through the above waterline discharge point; 6) has in operation a cargo monitor and control system that is designed for use with the oily mixture being discharged; and 7) is outside the Special Areas (33 CFR 157.37.)

APPS is amended by the Marine Plastic Pollution Research and Control Act of 1987 (MPPRCRA), which implements Annex V of MARPOL 73/78 in the U.S. The MPPRCRA and implementing regulations at 33 CFR 151.51 to 151.77 apply to U.S. Ships (except warships and ships owned or operated by the U.S.) everywhere, including recreational vessels, and to other ships subject to MARPOL 73/78 while in the navigable waters or the Exclusive Economic Zone of the U.S. They prohibit the discharge of plastic or garbage mixed with plastic into any waters and the discharge of dunnage, lining and packing materials that float within 25 nautical miles of the nearest land. Other unground garbage may be discharged beyond 12.
nautical miles from the nearest land. Other garbage ground to less than one inch may be discharged beyond three nautical miles of the nearest land. Fixed and floating platforms and associated vessels are subject to more stringent restrictions. "Garbage" is defined as all kinds of victual, domestic and operational waste, excluding fresh fish and parts thereof, generated during the normal operations of the ship and liable to the disposed of continuously or periodically except dishwater, graywaters and certain substances (33 CFR 151.05).

2. The Clean Air Act (CAA, 42 USC § 7401 et seg.) sets general guidelines and minimal air quality standards on a nationwide basis in order to protect and enhance the quality of the Nation’s air resources. States are responsible for developing comprehensive plans for all regions within their boundaries. Thus, as noted above, discharges of air pollutants over Washington State waters are subject to the control of the Washington Air Quality Control Board.

Per the CAA Amendments of 1990, section 329(a)(1) of the CAA provides that the Administrator of the EPA, following consultation with the Secretary of the Interior and the Commandant of the United States Coast Guard, "by rule, shall establish requirements to control air pollution from OCS sources located offshore of the States along the Pacific...Coast...to attain and maintain Federal and State ambient air quality standards and to comply with part C of title I...New OCS sources shall comply with such requirements on the date of promulgation."

3. The Clean Water Act (CWA, (The Federal Water Pollution Control Act) 33 USC § 1251 et seg.) was passed by Congress to restore and maintain the chemical, physical, and biological integrity of the nation’s waters. To varying degrees, navigable waters of the United States, the contiguous zone, and the oceans beyond are subject to requirements of the CWA.

The CWA’s chief mechanism for preventing and reducing water pollution is the National Pollutant Discharge Elimination System (NPDES), administered by the Environmental Protection Agency (EPA). Under the NPDES program, a permit is required for the discharge of any pollutant from a point source into the navigable waters of the United States, the waters of the contiguous zone, or ocean waters. Within Washington State waters, EPA has delegated NPDES permitting authority to the Washington Department of Ecology. Indian Tribes, however, attain permits directly from EPA.

Since oil and gas development pursuant to Federal lease sales occur beyond State waters, an NPDES permit from EPA is required for discharges associated with this activity. EPA generally grants NPDES permits for offshore oil and gas developments based on published effluent guidelines (40 CFR Part 435). Other conditions beyond these guidelines may, however, be imposed by the Regional Administrator on a case-by-case basis.

The CWA prohibits the discharge of oil or hazardous
substances in quantities that may be harmful to the public health or welfare or the environment, including but not limited to fish, shellfish, wildlife, and public and private property, shorelines and beaches into or upon the navigable waters of the U.S., adjoining shorelines, or into or upon the waters of the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act or the Deepwater Port Act of 1974, or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the U.S., except, in the case of such discharges into or upon the waters of the contiguous zone or which may affect the above-mentioned natural resources, where permitted under the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from ships.

When harmful discharges do take place, the National Contingency Plan (NCP) for the removal of oil and hazardous substance discharges (40 CFR Part 300), which is designed to minimize the impacts on marine resources takes effect. The USCG, in cooperation with EPA, administers the NCP. The NCP establishes the organizational framework whereby oil and hazardous substance spills are to be cleaned up. To carry out the NCP, regional plans have been established; the USCG has issued such a plan for Federal Region IX which encompasses the study area. Under the plan, Coast Guard personnel are to investigate all reported offshore spills, notify the party responsible (if known) of its obligation to clean up the spill, and supervise the clean-up operation. The Coast Guard retains final authority over the procedures and equipment used in the cleanup. If the party responsible for the spill does not promptly begin cleanup operations, the Coast Guard may hire private organizations.

The CWA also requires that publicly owned sewage treatment works meet effluent limitations based on effluent reductions attainable through the application of secondary treatment by July 1, 1977 (33 USC § 1311(b)(1)). EPA does have authority, however, to waive the July 1, 1977 deadline for secondary treatment for discharges into marine waters under certain circumstances (33 USC §1311(h)). There are no wastewater effluents currently being discharged into the Olympic Coast Sanctuary study area. However, the Makah Bay Tribe is studying alternatives for discharging effluents from a planned sewage treatment facility located at Makah Bay.

Permits from the Army Corps of Engineers, (COE) which are based on EPA guidelines, are required prior to the discharge of dredged or fill materials into navigable waters that lie inside the baseline from which the territorial sea (defined to be three nautical miles of shore) is measured and fill materials into the territorial sea (33 USC § 1344; 40 CFR 230.2).

Finally, the CWA requires vessels to comply with marine sanitation regulations issued by EPA and enforced by the USCG (33 USC § 1322).
4. The Coastal Zone Management Act (CZMA, 16 USC § 1451 et seq.) was designed to protect the environmental integrity of coastal areas by providing for state and local planning and management of human alterations to the coastal zone. The Act requires that federal actions be consistent with approved state coastal management programs. The consistency review provision of the law gives states a powerful tool to influence federal activities that impact state waters and coastal areas (e.g., offshore oil development). The Act is administered by the Office of Ocean and Coastal Resource Management (OCRM), National Oceanic and Atmospheric Administration (NOAA). The Act uses financial incentives to encourage states to develop coastal zone management plans, then guarantees that all federal activities that directly affect a state's coastal zone will have to be consistent with the federally approved state coastal programs. In 1976, the State of Washington was the first state to have a Coastal Zone Management Plan approved under this Act.

5. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 42 USC § 9601 et seq.), whose principal purpose is the cleanup of hazardous waste sites, consists of four fundamental elements. First, it creates an information-gathering and evaluation system to help Federal and state governments categorize hazardous waste sites and prioritize responses. Second, CERCLA provides Federal authority to respond to releases of hazardous substances. Response actions are carried out pursuant to the National Contingency Plan (NCP). Third, CERCLA establishes a Hazardous Substance Trust Fund to pay for removal and remedial actions and related costs. Finally, CERCLA makes persons responsible for hazardous substance releases liable for costs of removal or remedial action incurred by the Federal or state government; other necessary costs of response incurred by others; damages for injury, destruction or loss of natural resources; and costs of any health assessment or health effects study carried out pursuant to the Act.

6. The Endangered Species Act (ESA, 15 U.S.C. § 1531 et seq.) provides protection for listed species of animals and plants in both State waters and the waters beyond. The U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) determine which species need protection and maintain a list of endangered and threatened species. One of the most protective provisions of the Endangered Species Act is the prohibition against takings. The term "take" is defined broadly to mean "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct" (16 USC § 1532 (19)). The FWS regulations define the term "harm" to mean an act which actually kills or injures wildlife, including significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. The regulations define the term "harass" to mean "an intentional
or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering" (50 CFR 17.3).

The ESA also provides for the indirect protection of endangered species and their habitats by establishing a consultation process designed to insure that projects authorized, funded or carried out by Federal agencies are not likely to jeopardize the continued existence of endangered or threatened species, or "result in the destruction or adverse modification of habitat of such species which is determined... to be critical" (16 USC §1536). Critical habitat areas for endangered species are designated by the FWS and NMFS. The 1978 amendments to the Act establish a Cabinet level committee authorized to exempt Federal agencies (through an elaborate review process) from compliance with their responsibilities with regard to the jeopardy standard and critical habitat.

Several species of marine mammals found in the study area are listed as endangered or threatened species. These include: 1) sea otter; 2) gray whale; 3) fin whale; 4) right whale; 5) sei whale; 6) blue whale; 7) humpback whale; and 8) sperm whale.

Species of birds listed as endangered or threatened found in the study area include: 1) California brown pelican; 2) American peregrine falcon; 3) short tailed albatross; 4) Aleutian Canada goose; 5) American bald eagle. In addition the State of Washington lists the snowy plover as an endangered species, as well as the marbled murrelet.

7. The Federal Aviation Act (49 USC § 1301 et seq.) gives the Secretary of Transportation broad powers to promote air commerce and to regulate the use of navigable airspace to ensure aircraft safety and efficient use of such airspace. In furtherance of the mandate, the Federal Aviation Administration, within the Department of Transportation publishes aeronautical charts which provide a variety of information to pilots, including the location of sensitive areas which should be avoided.

8. The Fish and Wildlife Act of 1956 (16 USC §§ 742a-742j; 70 Stat. 119 as amended) Public Law 84-1024 initially established the Fish and Wildlife Service under the Assistant Secretary for Fish and Wildlife and a Commissioner for Fish and Wildlife. The Service consisted of the Bureau of Sport Fisheries and Wildlife and a Bureau of Commercial Fisheries, each having a Director. In 1970, the Bureau of Commercial Fisheries was transferred to the Department of Commerce. The Act was amended by P.L. 93-271 to abolish the office of Commissioner and establish the U.S. Fish and Wildlife Service under a Director. Under this Act, the Secretary is authorized to take such steps as may be required for the development, advancement, management, conservation, and protection of fish and wildlife resources.
including but not limited to research, development of existing facilities, and acquisition by purchase or exchange of land and water or interest therein. The Act also authorizes the Service to accept gifts of real or personal property for its benefit and use in performing its activities and services.

9. The Fish and Wildlife Coordination Act (16 U.S.C. § 661 et seq.) authorizes the Secretary of the Interior to, among other things: (1) provide assistance to, and cooperate with, Federal, State, and public or private agencies and organizations in the development, protection, rearing, and stocking of all species of wildlife, resources thereof, and their habitat, in controlling losses of the same from disease or other causes, in minimizing damages from overabundant species, in providing public ... fishing areas, including easements across public lands for access thereto, and in carrying out other measures necessary to effectuate the purposes of this Act; (2) make surveys and investigations of the wildlife of the public domain, including lands and waters or interests therein acquired or controlled by any agency of the United States; and (3) accept donations of land and contributions of funds in furtherance of the purposes of this Act.

Such areas made available to the Secretary of the Interior pursuant to this Act are administered by the Secretary directly or in pursuant to cooperative agreements in accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon, as may be adopted by the Secretary of the Interior and the head of the department or agency exercising primary administration of such areas.

10. The Magnuson Fishery Conservation and Management Act (MFCMA, 16 USC § 1801 et seq.) provides for the conservation and management of all fishery resources between 3 and 200 nm (5.6-370 KM) offshore. The National Marine Fisheries Service (NMFS) of the Department of Commerce is charged with establishing guidelines for and approving fishery management plans (FMPs) prepared by regional fishery management councils for selected fisheries. These plans determine the levels of commercial, sport and tribal fishing consistent with achieving and maintaining the optimum yield of each fishery. The waters of the study area are within the jurisdiction of the Pacific Fishery Management Council (PFMC).

In addition to non-benthic fishery resources located outside state waters, benthic continental shelf fishery resources located outside state waters such as crabs and sea urchins are also subject to management under the MFCMA. Within Federal waters the MFCMA is enforced by the U.S. Coast Guard (USCG) and NMFS. The Act empowers the Secretary of Commerce to enter into agreements with any State agency for enforcement purposes in State waters. Such an agreement exists between the WDF and NMFS whereby both parties have been deputized to enforce each other's laws. As a
result, PFMC fishery plan enforcement personnel can now enforce State law within 3 nm (5.6 km) and State officers can enforce Federal laws between 3-200 nm (5.6-370 km).

11. The **Marine Mammal Protection Act** (MMPA, 16 USC § 1361 et seq.) provides protection to marine mammals in both state waters and the waters beyond. It is designed to protect all species of marine mammals. As specified in the MMPA, the Department of Interior, U.S. Fish and Wildlife Service (FWS), is responsible for the management of polar bears, walrus (a pinniped), northern and southern sea otters, three species of manatees, and dugong; and Department of Commerce, National Marine Fisheries Service (NMFS), is responsible for all other marine mammals. The Marine Mammal Commission advises these implementing agencies and sponsors relevant scientific research. The primary management features of the Act include: 1) a moratorium on "taking" of marine mammals; 2) the development of a management approach designed to achieve an "optimum sustainable population" (OSP) for all species or population stocks of marine mammals; and 3) protection of populations determined to be "depleted."

MMPA defines "take" broadly to include "harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal" (16 USC § 1362(12)). The term "harass" has been interpreted to encompass acts unintentionally adversely affecting marine mammals, such as operation of motor boats in waters in which these animals are found. The MMPA allows certain exceptions to the moratorium. First, the Secretary may issue permits for public display or scientific research. Second, the Secretary may grant exemptions for takes of small numbers of marine mammals incidental to their lawful activities. Third, the Secretary may make a special waiver of the moratorium on taking for particular species of populations of marine mammals provided that the species or population being considered is at or above its determined optimum sustainable population. No such waiver, however, has been granted concerning any marine mammal found in the area under consideration.

Marine mammal species whose population is determined to be depleted receive additional protection. Under only limited circumstances may permits be issued for the taking of any marine mammal determined to be depleted, including but not limited to scientific research and enhancing the survival or recovery of a species or stock of depleted species. Marine mammals listed on the Federal threatened and endangered list include grey, right, fin, sei, blue, humpback, and sperm whales, and the northern (Stellar) sea lion.

The 1988 amendments to the MMPA added requirements that observers be carried aboard commercial fishing vessels to determine levels of incidental take of marine mammals. Commercial fishing activities are divided into categories on the basis of gear-type and associated levels of potential incidental take of marine mammals. For example, Category 1 vessels such as gillnetters may have to carry an observer if requested by NMFS.
and the Secretary of Commerce may place observers on vessels in Categories 2 and 3 with the consent of the vessel owner. This observer program has been in operation since early 1990 and although the authority for its management is with the NMFS the day-to-day operational management may be delegated to state and local authorities.

12. The Marine Protection, Research, and Sanctuaries Act (Title I) (MPRSA, 16 USC 1431 et seq.), also known as the Dumping Act, prohibits 1) any person from transporting, without a permit, from the US any material for the purpose of dumping it into ocean waters (defined to mean those waters of the ocean seas lying seaward of the baseline from which the territorial sea is measured) and 2) in the case of a vessel or aircraft registered in the US or flying the US flag or in the case of a US agency, any person from transporting, without a permit, from any location any material for the purpose of dumping it into ocean waters. Title 1 also prohibits any person from dumping, without a permit, into the territorial sea or the contiguous zone extending 12 nautical miles seaward from the baseline of the territorial sea to the extent that it may affect the territorial sea or the territory of the US, any material transported from a location outside of the US. EPA regulates, through the issuance of permits, the transportation for the purpose of dumping, and the dumping of all materials except dredged material; COE regulates the transportation, for the purpose of dumping, of dredged material. The COE permits are subject to EPA review and approval. Title I also makes it unlawful for any person to dump into ocean waters, or to transport for the purposes of dumping into ocean waters, sewage sludge or industrial waste.

13. The Migratory Bird Treaty Act (MBTA, 16 USC § 703 et seq.) The essential provision of the Migratory Bird Treaty Act, which implements conventions with Great Britain, Mexico, the USSR, and Japan, makes it unlawful, except as permitted by regulations, "to pursue, hunt, take, capture, kill...any migratory bird, any part, nest or egg" or any product of any such bird protected by the Convention (16 USC § 703). The Secretary of the Interior is charged with determining when, and to what extent, if at all, and by what means to permit these activities. Each treaty establishes a "closed season" during which no hunting is permitted. A distinction is made between game and nongame birds. The closed season for migratory birds other than game birds is year-round. The game birds found in the study area are ducks, geese, mergansers, and brants. As specifically permitted by the Act, the Washington Department of Wildlife has supplemented this authority with its own regulations (see Fish and Game Code Discussion above).

14. The National Aquaculture Act (16 USC § 3801 et seq.), as amended, encourages the development of aquaculture in the US by 1) declaring a national aquaculture policy, 2)
establishing and implementing a national aquaculture development plan, 3) directing the Department of Agriculture to act as the lead federal agency for promoting and assisting aquaculture development in the public and private sectors of the economy, and 4) establishing a National Aquaculture Information Center within the Department of Agriculture. The Act primarily instructs USDA to collect information through various means on the status and needs of the aquaculture industry in the US and prepare recommendations to the Congress on actions necessary for the growth and expansion of this industry.

15. The National Environmental Policy Act (NEPA, 42 USC § 4321 et seq.) was enacted "to ensure that environmental considerations are considered and weighed appropriately in government planning, policy making, and action." NEPA directs federal agencies to use an interdisciplinary approach in making decisions that may have an impact on the environment.

In proposing a major federal action that significantly affects environmental quality, a federal agency must consult with other federal agencies that have jurisdiction over any environmental aspect of the proposed action. The agency must prepare a detailed Environmental Impact Statement (EIS) describing the anticipated effects of the proposed action, any adverse environmental effects that cannot be avoided, and alternatives to the proposed action. The EIS must discuss the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity. It must also describe any irreversible and irretrievable resource commitments that the proposed action would entail.

One of the Act's most important features is that it provides substantial opportunities for the public to review and comment on actions by federal agencies that have significant environmental impacts. Federal agencies are required to circulate NEPA documents for review and comment to federal, state, and local environmental agencies as well as to the President, the Council on Environmental Quality, and the public. In addition, federal agencies are required to hold public hearings in the affected area to receive public testimony, and formally respond to all comments received on EISs.

16. The National Historic Preservation Act (NHPA, 16 USC § 470 et seq.) authorizes the Secretary of the Interior to maintain a National Register of "districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture." Sites have been listed on the National Register which include or are composed entirely of ocean waters and submerged lands within state waters or on the Outer Continental Shelf.

Any federal agency conducting, licensing, or assisting an undertaking which may affect a property listed or eligible for listing on the National Register must prior to the action take into account the effect of the undertaking on the property and
provide the Advisory Council on Historic Preservation a reasonable opportunity to comment on the proposed action (16 USC § 470f). The Basic criteria applied by the Council is whether the undertaking will change the quality of the site's historic, architectural, archeological, or cultural character (36 CFR Part 800).

17. The National Park Service Organic Act of 1916 (16 USC §§ 1, 2-4) established the National Park Service within the Department of Interior to "promote and regulate the use of the federal areas known as national parks, monuments, and reservations." The Act states that the purpose of national parks is to "conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." The Olympic National Park was established and placed under the governance of this act by a legislative amendment of 1938.

18. The National Wildlife Refuge System Administration Act of 1966 (16 USC §§ 668dd-668ee; 80 Stat. 927, as amended) Public Law 89-669 defines the National Wildlife Refuge System as including wildlife refuges, areas for the protection and conservation of fish and wildlife which are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas. The Secretary is authorized to permit any use of an area provided such use is compatible with the major purposes for which such area was established. The purchase consideration for rights-of-way go into the Migratory Bird Conservation Fund for the acquisition of lands. By regulation, up to 40 percent of an area acquired for a migratory bird sanctuary may be opened to migratory bird hunting unless the Secretary finds that the taking of any species of migratory game birds in more than 40 percent of such area would be beneficial to the species. The Act requires an Act of Congress for the divestiture of lands in the system, except (1) lands acquired with migratory bird funds may be divested upon approval of the Migratory Bird Conservation Commission; and (2) any lands can be removed from the system by land exchange, or if brought into the system by a cooperative agreement then pursuant to the terms of the agreement.

19. The Oil Pollution Act of 1990 (OPA, P.L. 101-380, 33 USC § 2701 et seq.) creates a comprehensive prevention, response, liability, and compensation regime for dealing with vessel and facility-based oil pollution. The OPA provides for environmental safeguards in oil transportation greater than those existing before its passage by: setting new standards for vessel construction, crew licensing, and manning; providing for better contingency planning; enhancing Federal response capability; broadening enforcement authority; increasing penalties; and authorizing multi-agency research and development. A one billion
dollar trust fund is available to cover clean-up costs and damages not compensated by the spiller.

Title I creates a liability and compensation regime for vessel and facility-source oil pollution. Any party responsible for the discharge, or the substantial threat of discharge, of oil into navigable waters or adjoining shorelines or the Exclusive Economic Zone is liable for the removal costs and damages, including assessment costs; for injury, destruction, loss or loss of use of natural resources, injury to, or economic losses resulting from destruction or real or personal property; subsistence use of natural resources, net lost government revenues, lost profits or impairment of earning capacity; and net costs of providing increased or additional public services during or after removal activities. NOAA has the responsibility for promulgating damage assessment regulations and following the regulations will create a rebuttable presumption in favor of a given assessment. Sums recovered by a trustee for natural resource damages will be retained in a revolving trust account to reimburse or pay costs incurred by the trustee with respect to those resources.

Title II makes numerous amendments to conform other Federal statutes, particularly section 311 of the Clean Water Act, to the provisions of the Oil Pollution Act.

Title III encourages the establishment of an international inventory of spill removal equipment and personnel.

Title IV is divided into three subtitles: A) Prevention; B) Removal; and C) Penalties and Miscellaneous. Subtitle A gives added responsibility to the Coast Guard regarding merchant marine personnel, including the review of alcohol and drug abuse and review of criminal records prior to issuance and renewal of documentation. It also amends the Ports and Waterways Safety Act to: require the Coast Guard to "require appropriate vessels which operate in an area of a vessel traffic service to utilize or comply with that service," and 2) authorize the construction, improvement, and expansion of vessel traffic services.

Further, Subtitle A establishes double hull requirements for tank vessels. Most tank vessels over 5,000 gross tons will be required to have double hulls by 2010, while vessels under 5,000 gross tons will be required to have a double hull or double containment systems by 2015. All newly constructed tankers must contain a double hull (or double containment systems if under 5,000 gross tons), while existing vessels are phased out over a period of years.

Subtitle B amends subsection 311(c) of the Clean Water Act, requiring the Federal Government to ensure effective and immediate removal of a discharge, and mitigation or prevention of a substantial threat of a discharge, of oil or a hazardous substance into or on the navigable waters, on the adjoining shorelines, into or on the waters of the Exclusive Economic Zone, or that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the U.S. It also requires a revision and republication of the National
Contingency Plan within one year which will include, among other things, a Fish and Wildlife response plan developed in consultation with NOAA and U.S. Fish and Wildlife Service. Nothing in Subtitle B preempts the rights of States to require stricter standards for removal action.

Subtitle C alters and increases civil and administrative penalties for illegal discharges and violations of regulations promulgated under the Clean Water Act.

Title VII authorizes an oil pollution research and technology development program, including the establishment of an interagency coordinating committee that is chaired by Department of Transportation and composed of representatives from the Departments of Energy, the Interior, Transportation, Commerce (including NOAA), and Defense, Environmental Protection Agency, Federal Emergency Management Agency, National Aeronautics and Space Administration, as well as such other Federal agencies as the President may designate.

Title IX amends the Oil Spill Liability Trust Fund and increases from $500 million to $1 billion the amount that can be spent on any single oil spill incident, of which no more than $500 million may be spent on natural resource damage, assessments and claims.

20. The Outer Continental Shelf Lands Act (OCSLA, 14 USC § 1331 et seq.), as amended in 1978 and 1985, establishes federal jurisdiction over the mineral resources of the Outer Continental Shelf (OCS) beyond 3 nm (5.6 km) of shore and gives the Secretary of Interior primary responsibility for managing OCS mineral exploration and development. The Secretary's responsibility has been delegated to the Minerals Management Service (MMS).

MMS is charged with supervising OCS oil operations, including approval of exploration, development and production plans and applications for pipeline rights of way on the OCS. Lessees are required to include in exploration, development and production plans specific information concerning emissions and their potential impacts on coastal areas. Such authority includes the enforcement of regulations made pursuant to the OCSLA (30 CFR Parts 250 and 256) and the enforcement of stipulations applicable to particular leases.

In unique or special areas, the MMS may impose special lease stipulations designed to protect specific geological and biological phenomena. These stipulations may vary among lease sale tracts and sales.

In addition to DOI, both the Army Corps of Engineers (COE) and the US Coast Guard (USCG) have responsibility over OCS mineral development to the extent that such development affects navigation (43 USC 1333). COE is responsible for ensuring, through a permit system, that OCS structures, including pipelines, platforms, drill ships and semi-submersibles do not obstruct navigation. USCG assures that structures on the OCS are properly marked and that safe working conditions are maintained.
21. The **Ports and Waterways Safety Act** (PWSA, 33 USC § 1231 *et seq.*) as amended by the Port and Tanker Safety Act of 1978 (and the Oil Pollution Act of 1990), is designed to promote navigation and vessel safety and the protection of the marine environment. The PWSA applies both in state waters and the waters beyond out to 200 nautical miles.

The PWSA authorizes the U.S. Coast Guard to construct, operate, maintain, improve or expand vessel traffic services and control vessel traffic in ports, harbors, and other waters subject to congested vessel traffic. The Oil Pollution Act of 1990 amends the PWSA to mandate that the USCG "require appropriate vessels which operate in the area of a vessel traffic service to utilize or comply with that service." The USCG, in conjunction with the Canadian Coast Guard operates a Traffic Separation Scheme (TSS) and a Vessel Traffic Service (VTS) in the Strait of Juan de Fuca to service the tankers, barges, fishing vessels and ferries.

In addition to vessel traffic control, the USCG regulates other navigational and shipping activities. It has promulgated numerous regulations relating to vessel design, construction, and operation designed to minimize the likelihood of an accident and reduce vessel source pollution.

The 1978 amendments of the PWSA establish a comprehensive program for regulating the design, construction, operation, equipping, and banning of all tankers using U.S. ports to transfer oil and hazardous materials. These requirements are, for the most part, in agreement with protocols (passed in 1978) to the International Convention for the Prevention of Pollution from Ships, 1973, and the International Convention on Safety of life at Sea, 1974.

The USCG is also vested with the primary responsibility for maintaining boater safety, including the tasks of conducting routine vessel inspections and coordinating rescue operations.

22. The **Rivers and Harbors Act** (33 USC § 401 *et seq.*) prohibits the unauthorized obstruction of navigable waters of the United States. The construction of any structure or any excavation or fill activity in the navigable waters of the U.S. is prohibited without a permit from the COE. Section 13 (33 USC § 407) prohibits the discharge of refuse into navigable waters of the U.S., but has been largely superseded by the CWA, discussed above.

23. The **Submerged Lands Act** (SLA, 43 USC § 1301 *et seq.*) distributes between the states and the federal government title to offshore lands and natural resources (including minerals and all living resources). The Act grants to the states title and ownership of the seabed from the coastline to 3 geographical miles (nautical miles) offshore in the Atlantic and Pacific Oceans and to 3 marine leagues (approximately 10 miles) in the
Gulf of Mexico. States thus have "the right and power to manage, administer, lease, develop and use the said lands and natural resources all in accordance with applicable state law." The federal government retains the constitutional right "to regulate or improve navigation, [and] to provide for flood control or the production of power..." within state waters.

24. The Wilderness Act of 1964 (16 USC §§ 1131-1136; 78 Stat. 890) directs the Secretary of the Interior to review, within ten years every roadless area of 5,000 acres or more and every roadless island regardless of size within the National Wildlife Refuge System and to recommend to the President the suitability of each such area for formal preservation under a special act of Congress.

The Wilderness Act stipulates that management of designated areas should be such as to "leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas,..." To this end, the Act generally prohibits any construction of roads or facilities, logging, any use of motorized vehicles, motorized equipment or motorboats. The Act also provided for termination within designated Wilderness areas of any new entry under the Mining Law of 1872 after December 31, 1983, although valid mineral rights existing as of that date are maintained.

The Act's definition states, in Part that "A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammled by man, where man himself is a visitor who does not remain." Further, the definition lists as one of an area's attributes that it "has outstanding opportunities for solitude or a primitive and unconfined type of recreation." Wilderness is the most protective form of designation that can be applied to Federal resource lands, given the prohibitions spelled out in the authorizing Act. (Siehl, George. 1991. "Natural Resource Issues in National Defense Programs. Congressional Research Service Report for Congress. The Library of Congress.)

B. Federal Agencies and Authorities

1. Army Corps of Engineers (COE) must approve any plans for development within navigable waters of the United States. This authority was granted by the Rivers and Harbors Act of 1899 and was primarily intended to assure efficient and safe commerce through the nation's waters. The review process now involves socio-economic and environmental impact reviews. The Corps thus has authority over such activities as dredging, ocean dumping, offshore oil platform installation, breakwater construction, marina construction, harbor development, marine outfall installation, etc.

2. Coastal States Organization (CSO) promotes the
interests of 35 coastal state and territorial governors in United
States coastal affairs.

3. **Department of Commerce (DOC)** regulates international maritime trade through the sanctuary area. However, the Department's most direct influence in the marine sector is through the activities of the National Oceanic and Atmospheric Administration (NOAA). NOAA conducts oceanic and atmospheric research and monitoring on behalf of the federal government, charts the nation's coastal waterways, operates the National Weather Service, manages fishery resources within the nation's 200-mile Exclusive Economic Zone (EEZ), provides expertise in marine pollution prevention and clean-up, administers the federal Coastal Zone Management Program, and enforces marine mammal and fishery protection laws. The National Marine Fishery Service (NMFS) is the branch of NOAA responsible for enforcing US fishery regulations and tracking the health and population status of commercial fishery stocks. NMFS also inspects seafood products and processing facilities for compliance with health standards and enforces the Marine Mammal Protection Act.

4. **Department of Defense (DOD)** conducts on-going activities in the sanctuary area - primarily surface and air military exercises. Some testing and underwater research is also conducted in the area. DOD is exempt from certain regulatory requirements due to national security reasons.

5. **Department of the Interior (DOI)** manages for the federal government a significant amount of tidelands and coastal uplands abutting the eastern sanctuary boundary. The National Park Service manages federal coastal lands on the western Olympic Peninsula and the US Fish and Wildlife Service manages all coastal islands and rocks in the area. The Department has complete police power over the lands of the Olympic National Park and the Washington Islands National Wildlife Refuge.

In addition to the above lands, the Department manages all submerged lands and mineral resources from 3 nautical miles offshore to the edge of the continental shelf. The Minerals Management Service has authority to lease federal offshore tracts for oil exploration and development; however, the 1992 reauthorization of the Marine Protection, Research, and Sanctuaries Act permanently banned all oil extraction activities within the final boundaries of the sanctuary.

6. **Department of Transportation (DOT)** regulates occupational safety and health on commercial offshore structures. Through the US Coast Guard, it responds to maritime emergencies, inspects vessels, recommends shipping lanes and "areas to be avoided" to the International Maritime Organization, and officiates as on-scene coordinator for oil spills at sea. The Coast Guard regulates and administers vessel licensing, maintains
aids to navigation, conducts maritime law enforcement, and provides coastal defense to the nation. The Coast Guard has broad authority to enforce many laws within the marine environment, including wildlife protection.

7. **Environmental Protection Agency (EPA)** is responsible for the control and abatement of pollution in the categories of air, water, solid waste, pesticides, radiation, and toxic substances. The Agency uses a variety of research, monitoring, regulatory and enforcement activities to carry out its mission. It has direct regulatory authority nationwide for many aspects of waste treatment and disposal. EPA is the lead federal agency for implementing and enforcing the provisions of the Clean Water Act and the Clean Air Act. The Agency has authority over offshore dredge disposal, marine sewage outfalls, point source effluent discharges, air pollution in nearshore areas, and hazardous spills on land in the coastal zone.

8. **Federal Aviation Administration (FAA)** has authority over commercial and civil aviation matters in the sanctuary area and regulates such factors as minimum flight altitude and landing areas.

9. **Federal Maritime Commission (FMC)** regulates the waterborne foreign and domestic offshore commerce of the United States, assures that United States international trade is open to all nations on fair and equitable terms, and protects against unauthorized, concerted activity in the waterborne commerce of the United States. This is accomplished by maintaining surveillance over steamship conferences and common carriers by water; assuring that only the rates on file with the Commission are charged; reviewing agreements between persons subject to the Shipping Act of 1934 and the Shipping Act of 1916; guaranteeing equal treatment to shippers, carriers, and other persons subject to the shipping statutes; and assuring that adequate levels of financial responsibility are maintained for indemnification of passengers.

10. **National Oceanic and Atmospheric Administration (NOAA)** See Department of Commerce.

11. **National Park Service (NPS)** See Department of Interior.

12. **US Coast Guard (USCG)** See Department of Transportation.

IV. TRIBAL AUTHORITIES

A. Treaty of Neah Bay and the Treaty of Olympia (1855)

The Stevens Treaties of 1855 include the Treaty of Neah Bay (January 31, 1855. 12 Stat. 939) with the Makah Indians and the Treaty of Olympia (July 1, 1855. 12 Stat. 971) whose signatories include the Quinault, Quileute and Hoh Tribes. These treaties secure for these coastal Indian tribes the right to fish and hunt in their usual and accustomed fishing grounds. The Treaty of Neah Bay included the guaranteed right of the Makah to hunt and collect whales in their usual and accustomed harvesting areas. The Treaties also secure access to Tribal lands for Treaty Tribes.

The usual and accustomed fishing areas were delineated by the Boldt Decision in 1974 which concluded that Indian tribes of Puget Sound and coastal Washington have the right to an opportunity to take up to 50 percent of the total number of harvestable salmonids, as well as the right to regulate their own fishers (United States v. Washington, 384 F. Supp. 312, 1974). All of the Olympic Coast National Marine Sanctuary waters are designated as Usual and Accustomed Fishing areas.

Aboriginal and treaty-secured rights can only be abrogated if there is clear evidence that Congress actually considered both the conflict between its intended action and Indian treaty rights and chose to resolve the conflict by abrogating the treaty. Regulations which restrict the exercise of treaty-secured hunting and fishing rights are lawful only if they are "reasonable and necessary" to "prevent demonstrable harm" to a harvested species or stock (United States v. Washington, 384 F. Supp. 312, 342, 415 (W.D.Wash. 1974) aff'd, 520 F.2d 676 (9th Cir. 1975) and are the least restrictive alternative for achieving this purpose (United States v. Washington, 384 F. Supp. at 342.

V. INTERNATIONAL AUTHORITIES

A. The U.S.-Canada Pacific Salmon Interception Treaty (Pacific Salmon Treaty)

The Pacific Salmon Treaty was signed on January 28, 1985 to provide a means to manage, conserve and rebuild stocks of the five species of salmon that inhabit coastal waters of Oregon, Washington, Alaska and Canada. The primary purpose of the Treaty is to equitably address the problem of "interceptions" -- that is, the harvest of one country's salmon by foreign fishermen. The Treaty requires the U.S. and Canada to prevent overfishing and to provide for optimum production while ensuring that each country receives compensation equal to the salmon originating in its waters. The Treaty does not affect or modify existing aboriginal rights established by treaty or Federal law.
The Treaty established the Pacific Salmon Commission as its decision-making body. Implementing the Treaty involves international rules, numerous parties and several competing interests. The Commission deals with five species of salmon, three major commercial gear groups, plus sport and Indian fishermen. In addition, the Commission deals with four governments and various Indian tribes with a treaty right to a share of the harvestable fish passing their traditional fishing grounds. The Commission itself does not regulate the salmon fisheries, but provides regulatory advice and recommendations to the two countries. Pursuant to the Treaty, each party is required to conduct joint research on migratory and exploitation patterns and extent of interceptions. Further, the parties must share data on proposed enhancement programs.

B. The 1979 Protocol to the Halibut Convention of 1953

The International Pacific Halibut Commission (IPHC), formerly the International Fisheries Commission (IFC), was established in 1923 by a Convention between Canada and the United States for the preservation of the Pacific halibut fishery of the North Pacific Ocean and the Bering Sea. The Commission's authority was gradually expanded and revised by successive Conventions: namely the 1930, 1937, and 1953 Conventions. The 1953 Convention was amended by the Protocol of 1979. In the spring of 1982, the United States passed the necessary legislation to give effect to the 1979 protocol and to repeal the previous enabling legislation; the amended Northern Pacific Halibut Act of 1937.

The Halibut Convention requires that the Commission allocate halibut between U.S. and Canadian fisheries, but in not explicit on domestic allocation. The Commission assumed limited allocative responsibility, but made allocative decisions only after consulting with representatives of the national governments. In 1987, the U.S. National Oceanic and Atmospheric Administration determined that regional fishery management councils should undertake allocating halibut among various domestic user groups.

The Commission's jurisdiction is divided into statistical areas or units delineated by lines spaced 60 nautical miles apart. The Olympic Coast National Marine Sanctuary lies in subarea 2A. Allocation recommendations for area 2A are made to the Secretary of Commerce by the Pacific Fishery Management Council (PFMC) for treaty Indian fisheries and non-treaty sport and commercial fisheries. Representatives of the tribes, the states of Washington and Oregon, the U.S. government, and the IPHC participate in work groups to develop recommendations to the Council. Council recommendations pass through the IPHC for approval. (Trumble, Robert et. al. 1991. "Evaluation of Pacific Halibut Management for Regulatory Area 2A." Scientific Report No. 74. International Pacific Halibut Commission, Seattle Washington).
C. Cooperative Vessel Traffic Management System (CVTMS)

The Cooperative Vessel Traffic Management System (CVTMS) is a maritime traffic control program jointly managed and operated by the United States and Canada in the Strait of Juan de Fuca and San Juan Island areas. The system is designed to enhance safe and expeditious vessel traffic movement, to prevent groundings and collisions, and to minimize risk of property damage and pollution to the marine environment. It is operated by the US Coast Guard and the Canadian Coast Guard. Vessel Traffic Management Centers of the CVTMS monitor ship movements using radar and radio equipment and issue directions and warnings to control and supervise traffic.

The CVTMS area is divided into zones, each of which is administered solely by the United States or Canada. The appropriate Vessel Traffic Management Center administers, within its zone, the regulations issued by both nations. Each set of regulations applies only to the waters over which the issuing nation has jurisdiction and each nation will enforce only its own set of regulations. The United States regulations (33 CFR 161.200-.266) apply in the CVTMS area to 1) each vessel of 30 meters or more in length and 2) each vessel that is engaged in towing alongside or astern, or in pushing ahead, one or more vessels or objects, other than fishing gear (where the combined length of the vessel and tow exceeds 44 meters, or the vessel or tow individually exceeds 19 meters). Participation with CVTMS is mandatory for most vessels.

A critical component of the system is the joint designation by US and Canadian authorities of a vessel traffic separation scheme to route inbound and outbound traffic. The vessel traffic lanes are printed on both US and Canadian navigational charts. The Vessel Traffic Management Centers can thus issue instructions to keep traffic within the appropriate lanes and reduce congestion and the risk of collision.

The CVTMS - through its use of regulation, vessel surveillance, traffic control, and separation lanes - has been quite successful in averting collisions and groundings. It also contributes valuable assistance during emergency and search-and-rescue operations.
APPENDIX K: MEMORANDUM OF UNDERSTANDING BETWEEN ASSISTANT ADMINISTRATOR FOR FISHERIES AND ASSISTANT ADMINISTRATOR FOR OCEAN SERVICES AND COASTAL ZONE MANAGEMENT CONCERNING THE NATIONAL MARINE SANCTUARY PROGRAM
Memorandum of Understanding between Assistant Administrator for Fisheries and Assistant Administrator for Ocean Services and Coastal Zone Management Concerning the National Marine Sanctuary Program
Memorandum of Understanding

between

Assistant Administrator for Fisheries

and

Assistant Administrator for Ocean Services and Coastal Zone Management

Concerning the National Marine Sanctuary Program

January 1992

William W. Fox, Jr.
Assistant Administrator for Fisheries

John J. Carey
Assistant Administrator for Ocean Services and Coastal Zone Management
AN AGREEMENT

INTRODUCTION

The National Marine Fisheries Service (NMFS) and the National Ocean Service (NOS) play important roles in the conservation of the Nation's living marine resources. The National Marine Sanctuary Program (NMSP), administered by the Sanctuaries and Reserves Division (SRD) of NOS, seeks to identify and conserve areas of the marine environment of special national significance due to their resource or human-use values through coordinated management, research, and monitoring of these areas. NMFS conducts research on living marine resources and their habitats, seeks to protect marine habitats, and manages fisheries in federal waters in collaboration with eight Regional Fishery Management Councils ("Councils").

NMFS and NOS hereby agree to a process by which they can collaborate in achieving the goals and objectives of Title III of the Marine Protection, Research and Sanctuaries Act (MPRSA), the Magnuson Fishery Conservation and Management Act (MFCMA), the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), and the Fish and Wildlife Coordination Act (FWCA).

A. NOS ROLE

In order to facilitate NMFS assistance, NOS agrees to do the following in administering the National Marine Sanctuary Program:

1) Notify and provide NMFS with the opportunity to comment and/or concur at the following stages of the sanctuary designation process:

a) review of the Site Evaluation List (SEL);
b) selection of sites for elevation to Active Candidate status;
c) development of draft and final environmental impact statements and management plans, particularly with respect to the following elements of these documents:

i) consideration of present and potential activities affecting sanctuary resources;
ii) evaluation of the adequacy of existing
management authorities;

iii) evaluation of the manageability of the area and enforceability of management measures;

iv) assessment of the negative impact of management restrictions;

v) preparation of the resource assessment report;

vi) estimation of enforcement costs

2) Cooperate with NMFS in the consideration of fishing regulations in proposed national marine sanctuaries by doing the following:

a) Before elevation of a site to Active Candidate status, consult with NMFS regarding the living marine resources, management measures, and living marine resource issues in the sanctuary study area;

b) Upon elevation of a site to Active Candidate status, request NMFS assistance in briefing the relevant Fishery Management Council(s) regarding the site and the need for fishing regulations at the earliest opportunity and on a continuing basis as required;

c) Request NMFS participation in discussions regarding living marine resource and habitat issues with the site and request that NMFS secure the participation of appropriate representation by the relevant Fishery Management Council(s);

d) Provide a reasonable opportunity for comment and seek NMFS concurrence in recommendations to the Secretary regarding findings, determinations, and preparation of regulations as described in 16 U.S.C. 1434(a) (5).

3) Cooperate with NMFS in the consideration of management measures for species protected by the MPA and/or the ESA ("protected species") in proposed national marine sanctuaries by doing the following:

a) Before elevation of a site to Active Candidate status, consult with NMFS regarding protected species, existing management measures, and protected species issues in the sanctuary study area;

b) Upon elevation of a site to Active Candidate status, seek NMFS concurrence in proposing sanctuary management measures for protected species;

c) Request NMFS participation in discussions on protected species and habitat issues in the site;

d) Provide a reasonable opportunity for comment and seek concurrence from NMFS on Secretary decisions to list activities as subject to sanctuary regulation that may also be subject to regulation under the MPA and/or ESA. NOS will cooperate and seek concurrence from NMFS in the preparation of any regulations pertaining to
such activities.

4) In implementing sanctuary management plans, NOS will do the following:

a) Cooperate with NMFS in the preparation of emergency response and contingency plans for national marine sanctuaries as these plans affect living marine resources and habitats of particular concern to species managed under the MFCMA, MMPA and ESA;

b) Cooperate with NMFS in the evaluation of management measures in existing national marine sanctuaries in relation to the management of living marine resources under the MFCMA, MMPA and ESA;

c) Cooperate with NMFS regarding amendments to the lists of species under the ESA;

d) Review applications for permits issued under the MMPA or ESA for activities that may also be subject to prohibitions in national marine sanctuaries;

e) Grant, condition, or deny permission for proposed activities in national marine sanctuaries under the MPRSA in coordination with NMFS denial, conditioning, or granting of requested permits under the authority of the MMPA or ESA.

5) NMFS concurrence or disagreement with NOS recommendations to the Under Secretary for Oceans and Atmosphere described in A(2)(d) and A(3)(d) shall be noted in corresponding memoranda by the Assistant Administrator for Fisheries.

6) The NOS transmittal memorandum shall attach any NMFS concurrence or disagreement provided in accordance with section 5 above. NOS shall indicate on the transmittal memorandum a) the amount of time afforded to NMFS for review and response, and b) where disagreement is indicated, reference to an attached statement of the reasons therefor as provided by NMFS.

7) NOS will cooperate with NMFS in insuring that recovery plans for species listed under the Endangered Species Act, conservation plans under the Marine Mammal Protection Act, fishery management plans, and sanctuary management plans are mutually supportive to the greatest extent possible.
B. NMFS ROLE

In carrying out its role, NMFS agrees to do the following:

1) Cooperate with and provide information and recommendations to NOS at the stages of the sanctuary designation process identified in item A(1).

2) Cooperate with NOS in the consideration of fishing regulations in proposed national marine sanctuaries by doing the following:
   a) Before elevation of a site to Active Candidate status, provide NOS with information regarding the living marine resources, management measures, and living marine resource issues in the sanctuary study area;
   b) Upon elevation of a site to Active Candidate status, assist NOS in briefing the relevant Fishery Management Council(s) regarding the site and the need for fishing regulations at the earliest opportunity and on a continuing basis as required;
   c) Participate in discussions regarding living marine resource and habitat issues with the site;
   d) Consult with NOS on its recommendations to the Secretary regarding findings, determinations, and preparation of regulations as described in 16 U.S.C. 1434(a)(5).

3) Cooperate with NOS in the consideration of management measures for species protected by the ESA and/or MMPA ("protected species") occurring in proposed sanctuary sites by doing the following:
   a) Before elevation of a site to Active Candidate status, provide NOS with information regarding the protected species, existing management measures, and protected species issues in the sanctuary study area;
   b) Participate in discussions with NOS regarding protected species and habitat issues with the site;
   c) If the Secretary decides to list as subject to sanctuary regulation activities that may be subject to regulation under the MMPA and/or ESA, cooperate with NOS in the preparation of any regulations pertaining to such activities.

4) In assisting NOS in the implementation of sanctuary management plans, NMFS shall do the following:
   a) Cooperate with NOS in the preparation of emergency response and contingency plans for national marine
sanctuaries as these plans affect living marine resources and habitats of particular concern to species managed under the MFCMA, MMPA and ESA;

b) Cooperate with NOS in the evaluation of management measures in existing national marine sanctuaries in relation to the management of living marine resources under the MFCMA, MMPA and ESA;

c) Consult with NOS regarding amendments to the lists of species under the ESA;

d) Provide NOS with copies of applications for permits issued under the ESA and MMPA for activities that may occur in national marine sanctuaries;

e) Issue, condition, or deny requested permits under the authority of the ESA or MMPA in coordination with NOS denial, conditioning or granting permission for proposed activities in national marine sanctuaries under the MPRSA.

5) In cooperation with NOS, periodically brief the relevant Fishery Management Councils regarding the national marine sanctuary program.