

OLYMPIC COAST NATIONAL MARINE SANCTUARY

Navigating the Future

Management Plan Review



Report to the Olympic Coast National Marine Sanctuary Advisory Council from the Living Resource Conservation Working Group *Submitted to the OCNMS Advisory Council on 22 January 2010*

At its May 2009 meeting, the OCNMS Advisory Council (AC) created the Living Resource Conservation (LRC) working group and recommended the group discuss 1) how information from research, monitoring, and assessments could be used to develop conservation strategies, and 2) if conservation strategies could be applied where assessment is adequate. Past and ongoing conservation efforts by OCNMS include outreach to pilots informing them of wildlife disturbance concerns and the existing OCNMS wildlife disturbance mitigation (overflight restriction zone), participation in the Pacific Fishery Management Council (PFMC) essential fish habitat review committee, regular monitoring of the Area-to-be-Avoided, participation in oil spill contingency planning processes, proactive monitoring for invasive species, and marine debris removal and outreach efforts. Based on public scoping comments and Olympic Coast Intergovernmental Policy Council and AC recommendations, LRC working group co-chairs identified the group's focal areas to be marine debris, water quality protection, habitat protection, wildlife disturbance, biodiversity and other cross-cutting topics.

MARINE DEBRIS STRATEGIES

I. INTRODUCTION

The Marine Debris Research, Prevention, and Reduction Act requires National Oceanic and Atmospheric Administration and the U.S. Coast Guard to jointly develop a definition for marine debris and promulgate it through regulations. These agencies have proposed that marine debris be defined as *"any persistent solid material that is manufactured or processed and directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment or the Great Lakes"*. OCNMS will use this definition for this document and the OCNMS management plan review process.

Strategies and activities outlined in this document were developed initially from recommendations provided at a 21 August 2009 meeting of the LRC working group. Additional ideas were provided in comments received during the public scoping period.



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These sources formed the basis of a preliminary document that was discussed on a conference call on 10 September 2009 attended by a self-selected subgroup of the LRC working group – Jeff June (NRC), Fan Tsao (MCBI), Jennifer Hagen (Quileute Natural Resources), Joe Gilbertson (Hoh Natural Resources), Eric Wilkins (NWIFC), Jody Kennedy (Surfrider), Deanna Lynch (USFWS), Brent Norberg (NMFS), and Liam Antrim (OCNMS).

II. RECOMMENDED STRATEGIES & ACTIVITIES

STRATEGY #MD1:

Identify, locate, and remove lost or abandoned submerged or floating marine debris

WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

To collaborate with partners to identify the types and locations of abandoned submerged and floating marine debris in the Sanctuary, and to promote removal of such materials when feasible.

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:

ACTIVITY A: Promote use by tribal and non-tribal fishers of the Washington Department of Fish and Wildlife (WDFW) reporting system or other systems established for reporting locations of lost fishing gear and other forms of submerged and floating marine debris.

ACTIVITY B: Support programs that focus on the outer Washington Coast to locate abandoned submerged and floating marine debris, develop safe and minimal impact removal techniques, and remove known marine debris.

ACTIVITY C: Support efforts that improve the local opportunities for marine debris disposal and recycling programs.

ACTIVITY D: Continue to record observations of abandoned submerged and floating marine debris made during OCNMS research and monitoring programs. Report relevant observations through the WDFW Derelict Fishing Gear reporting system.

ACTIVITY E: Continue development of an OCNMS database and geographic information system (GIS) products for marine debris identified through OCNMS and others' efforts. Collaborate in efforts to prioritize removal of submerged and floating marine debris.



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ACTIVITY F: Collaborate with the U.S. Department of Defense to identify and remove existing marine debris, and to mitigate military use of expendable materials that contribute to accumulation of marine debris in the sanctuary.

PARTNERS: Hoh, Makah, and Quileute tribes and Quinault Nation, Washington state, NOAA Marine Debris Program, regional port authorities, Outer Coast Marine Resources Committee, U.S. Department of Defense, Northwest Straits Initiative, and non-governmental organizations

RESOURCES:

- Staff time
- Established reporting system for lost gear and other marine debris
- Maintenance of database and GIS computer systems at OCNMS
- Grant funding with/to partners

STRATEGY #MD2:

Mitigate impacts of marine debris on coastal beaches and in the intertidal zone

WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

To reduce environmental and aesthetic impacts of marine debris by participation in cleanup, source control, and public outreach programs

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:

ACTIVITY A: Support programs that engage coastal communities and volunteers in marine debris outreach programs and beach cleanups, including expansion of Washington Clean Coast Alliance efforts to include multiple volunteer beach cleanup efforts on shores adjacent to the Sanctuary throughout the year.

ACTIVITY B: Participate as an active partner in the Washington Clean Coast Alliance (WCCA).

ACTIVITY C: Conduct outreach to increase public understanding of the nature and scope of environmental impacts of marine debris, and encourage individual efforts to reduce sources of marine debris.



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ACTIVITY D: Collaborate with Olympic National Park and Washington Islands National Wildlife Refuge to develop beach cleanup initiatives focused on remote coastal areas of Olympic National Park and Washington Islands National Wildlife Refuge shores.

ACTIVITY E: Promote inventory of marine debris from outer Washington Coast beaches. Use marine debris data in public outreach and regional efforts to identify and reduce sources of marine debris.

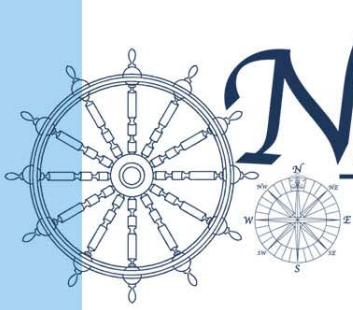
ACTIVITY F: Support programs in coastal communities to identify potential sources of land-based marine debris, improve garbage management and recycling opportunities and other programs with potential to reduce the sources of marine debris.

Activity G: Collaborate with the U.S. Department of Defense to use military manpower and equipment to support beach cleanups and other marine debris removal efforts in the sanctuary.

PARTNERS: Hoh, Makah, and Quileute tribes and Quinault Nation, coastal communities, Washington Clean Coast Alliance, NOAA Marine Debris Program, Outer Coast Marine Resources Committee, Washington state, Olympic National Park, Washington Islands National Wildlife Refuge, U.S. Department of Defense, and non-governmental organizations

RESOURCES:

- Staff time
- Continued efforts of Washington Clean Coast Alliance
- Volunteer support
- Grant funding with/to partners



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WATER QUALITY PROTECTION STRATEGIES

I. INTRODUCTION

It is difficult to clearly isolate water quality protection activities from research, monitoring, or outreach activities. 'Water quality protection' can be used to reference actions taken to prevent, mitigate, or eliminate degradation of water quality and negative impacts to natural and cultural resources from degraded water quality. Such actions are supported by research and monitoring to improve understanding of issues and effectiveness of the actions. Water quality protection actions also can be reinforced through outreach to expand citizen familiarity with water quality issues and to encourage actions that individuals and organizations can take to minimize impacts to water quality. Although the focus of the LRC working group's recommendations was on protection of water quality, this group included, where appropriate, recommendations for research, monitoring and outreach actions that support water quality protection.

Strategies and activities outlined in this document were developed initially from recommendations provided at a 21 August 2009 meeting of the LRC working group. Additional ideas were provided in comments received during the public scoping period. These sources formed the basis of a preliminary document that was discussed on a conference call on 24 September 2009 attended by a self-selected subgroup of the LRC working group – Amy Jankowaic (WDOE), Fan Tsao (MCBI), Teresa Scott (WDFW), Eric Wilkins (NWIFC), Allen Pleus (WDFW), Fred Felleman (Wave Consulting), Marcie Keever (Friends of the Earth), Deanna Lynch (USFWS), and Liam Antrim, John Barimo and George Galasso (OCNMS).

II. RECOMMENDED STRATEGIES & ACTIVITIES

STRATEGY #WQP1:

Reduce, through regulatory changes, voluntary and outreach measures, and/or marina facilities improvements, the degradation of water quality caused by vessel discharges of treated and untreated wastewater and sewage.



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BACKGROUND:

Through consultation with the Office of National Marine Sanctuaries (headquarters), OCNMS staff developed preliminary ideas for modifications to OCNMS regulations to consider during management plan review. These ideas will be discussed with the IPC and the AC. They include modifications based on recent environmental assessments and regulatory changes made by other West Coast sanctuaries related to vessel discharges. National marine sanctuaries in California have regulations that 1) prohibit all wastewater and sewage product discharge from cruise ships in waters of the sanctuaries, 2) prohibit discharge of fish, fish parts, and chumming materials unless associated with lawful fishing, 3) prohibit discharge of biodegradable effluent from marine sanitation devices on large vessels (i.e., 300 gross tons or greater), and 4) prohibit discharge of untreated sewage from holding tanks or Type III marine sanitation devices (MSDs). Based on consultations with the IPC, AC, and headquarters, OCNMS may modify its regulations to incorporate some of these provisions. Land based pump-out facilities are not currently functional at marinas in Neah Bay and LaPush, which complicates immediate implementation of a stricter regulation related to Type III MSDs.

Collectively, the Clean Water Act Section 312 and its implementing regulations: require all vessels with toilet facilities to have operable MSDs; allow discharges from operable Type I and II MSDs within three miles offshore; and allow discharges from Type III MSDs outside three miles offshore, or at land based pump-out facilities. 33 CFR 159.3 provides the following definitions for the three types of MSDs:

- Type I marine sanitation device means a device that produces an effluent having a fecal coliform bacteria count not greater than 1,000 per 100 milliliters and no visible floating solids.
- Type II marine sanitation device means a device that produces an effluent having a fecal coliform bacteria count not greater than 200 per 100 milliliters and suspended solids not greater than 150 milligrams per liter.
- Type III marine sanitation device means a device that is designed to prevent the overboard discharge of treated or untreated sewage or any waste derived from sewage (typically a holding tank).

Concerns about water quality degradation resulting from cruise ship discharges are justified. A recent assessment of wastewater discharges from cruise ships found that improperly functioning traditional MSDs were common in the industry (EPA 2008). The majority of samples from cruise ship with traditional MSDs failed to meet criteria for fecal coliforms and total suspended solids. This study also found



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high fecal coliform concentrations in graywater samples (drainage from dishwasher, shower, laundry, bath, galley drains and washbasin drains) - one to three orders of magnitude greater than typical fecal coliform concentrations in untreated domestic wastewater.

Recently revised regulations from California national marine sanctuaries are provided as background documents at http://olympiccoast.noaa.gov/protection/mpr/mpr_Econserve.html). An environmental review of sewage and graywater discharges from large vessels in Channel Islands National Marine Sanctuary that supports these regulations is available at <http://channelislands.noaa.gov/manplan/documents.html>.

In Washington state, the Department of Ecology (WDOE) has worked with the NorthWest CruiseShip Association (NWCA) and Port of Seattle to address similar concerns. In 2004, a memorandum of understanding (MOU) was finalized that covers large passenger ships with membership in NWCA, and it has been updated a number of times since. This MOU prohibits, on a voluntary basis, discharges of both untreated blackwater (waste from toilets, urinals, medical sinks and other similar facilities) and untreated graywater to Washington state waters from all cruise ships except discharges treated with advanced wastewater treatment systems and when stringent requirements are met. The MOU also prohibits, on a voluntary basis, discharge of residual solids within 12 nautical miles from shore and within OCNMS. WDOE has published annual assessments of the environmental effects of the cruise ship industry in Washington (see [http://www.ecy.wa.gov/programs/wq/wastewater/cruise MOU/index.html](http://www.ecy.wa.gov/programs/wq/wastewater/cruise%20MOU/index.html)). The 2008 assessment notes limitations in the MOU including its voluntary nature and limited applicability to only vessels that land in Washington state or are members of the NWCA.

California national marine sanctuaries also revised regulations to clarify language concerning chumming (or discharge of fish and fish parts) that it must be conducted as part of a lawful fishing practice. These revision was intended to eliminate ambiguity and inconsistency in sanctuary regulations related to chumming. Regarding discharge of fish parts or processing wastes in waters of OCNMS, local fishery managers have expressed concerns also about impacts on water quality, particularly depleted oxygen, caused by large volumes of waste material discharged by “factory” processing ships. While such discharge is allowed under current OCNMS regulations, scientific literature supports a concern for water quality impacts through increased biological and chemical oxygen demand.



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REFERENCE

EPA (U.S. Environmental Protection Agency). 2008. Cruise Ship Discharge Assessment Report. EPA842-R-07-005. December 2008.

WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

Maintain high quality of waters of the Sanctuary and protect sanctuary natural resources through minimization of vessel discharges

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:

ACTIVITY A: Support continued monitoring of and reporting on voluntary measures that limit cruise ship discharges to waters of the Sanctuary. As reports become available, evaluate potential changes in risk to water quality and resources in the Sanctuary.

ACTIVITY B: Work with the cruise ship industry, Washington Department of Ecology, and Port of Seattle to modify their existing MOU to include voluntary measures that eliminate discharge in the OCNMS of any wastewater (treated or untreated) from cruise ships in waters of the Sanctuary.

ACTIVITY C: Work with the shipping industry and others to assess potential impacts of wastewater discharges from large vessels (300 gross tons or greater), and to identify measures industry can take to prevent or mitigate those impacts.

ACTIVITY D: Modify OCNMS regulations to prohibit all discharges from cruise ships into waters of the Sanctuary except clean vessel engine cooling water, clean vessel generator cooling water, clean bilge water, and anchor wash. (*Note: this would provide the cruise ship industry with consistent regulations in all West Coast national marine sanctuaries regarding discharges.*)

ACTIVITY E: Work with commercial fishing interests, including fishers and fishery co-managers, to assess potential impacts of commercial-scale discharge of fish and fish parts to waters of the Sanctuary, to assess impacts to the fishing industry of possible regulatory changes that would prohibit discharge of fish and fish parts originating from outside the Sanctuary, and/or to mitigate potential impacts of fish waste discharges to waters of the Sanctuary.



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ACTIVITY F: Encourage and assist regional port authorities to improve availability of pump-out facilities by 2012.

PARTNERS: Hoh, Makah, and Quileute tribes and Quinault Nation, coastal communities, Washington State departments of Ecology and Fish and Wildlife, regional port authorities, cruise ship industry, shipping industry, commercial fishing interests, and non-governmental organizations

RESOURCES:

- Staff time

STRATEGY #WQP2:

Collaborate in efforts to identify land- and air-based sources of contaminants entering waters of the Sanctuary and to understand the potential impacts of these contaminants; support and collaborate in efforts to reduce, eliminate, or mitigate impacts of contaminants to natural resources in the Sanctuary.

WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

Maintain and restore water quality to levels that support healthy and resilient natural resources, by reducing water quality degradation from upland activities and air-borne contaminants.

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:

ACTIVITY A: Support and collaborate in efforts to identify, characterize, and mitigate point sources of contaminants within or entering waters of the Sanctuary and accumulating in biota and habitats

ACTIVITY B: Support and collaborate in efforts to characterize, reduce or eliminate potential contaminant non-point sources originating from upland land use practices and to mitigate their impacts to natural resources

ACTIVITY C: Support completion of a threat assessment to identify contaminant sources and impacts, ongoing and potential, of degraded water quality on natural resources in the Sanctuary. Use this threat assessment to prioritize water quality protection efforts accordingly.



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ACTIVITY D: Continue to support closure of the Warmhouse Dump and efforts to provide new solid waste management options for the Makah Reservation.

ACTIVITY E: Consult with relevant parties (NPS, local governments, EPA, etc.) to develop, prioritize, and implement collaborative strategies to address existing and potentially new contaminant sources and reduce impacts to natural resources.

PARTNERS: U.S. Environmental Protection Agency, Washington State Department of Ecology, Hoh, Makah, and Quileute tribes and Quinault Nation, local governments, coastal communities, Outer Coast Marine Resources Committee, Olympic National Park, Washington Islands National Wildlife Refuge, U.S. Department of Defense, and non-governmental organizations

RESOURCES:

- Staff time
- Travel funds

Note: Strategies WQP3 and 4 were developed by the LRC working group and forwarded to other working groups. The Collaborative Research and Monitoring working group had not finalized recommendations when this document was completed, so a comparison of similar recommendations from two working groups could not be completed. This does not present a problem, however, because in development of action plans, OCNMS staff can align similar recommendations from more than one working group.

STRATEGY #WQP3: [provided to CRAM working group]
Collaborate in regional efforts to research and monitor harmful algal blooms (HABs), minimize the risk of shellfish poisoning of humans, and understand the impacts of HABs on natural resources, including wildlife.

WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

Contribute to regional and national efforts to understand HABs off the Washington coast and to minimize risks to human health.

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:



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ACTIVITY A: Support and work with partners to define a baseline characterization for HABs off the Washington coast, including improved methods of monitoring and detection, and improved understanding of impacts to natural resources.

ACTIVITY B: Use known HAB events as opportunities to encourage and conduct research and monitoring to characterize the causes and extent of impacts to wildlife, other natural resources and humans.

ACTIVITY C: Continue to conduct and make improvements to water quality monitoring conducted by OCNMS and partners.

PARTNERS: Hoh, Makah, and Quileute tribes and Quinault Nation, coastal communities, NOAA NW Fisheries Science Center, Outer Coast Marine Resources Committee, Washington state departments of Health and Fish and Wildlife, ORHAB (Olympic Region Harmful Algal Bloom), Olympic National Park, Washington Islands National Wildlife Refuge, U.S. Coast Guard and non-governmental organizations

RESOURCES:

- **Staff time**
- **Support for the OCNMS nearshore mooring program (vessel time, fuel, captain, mooring program lead, etc.)**

STRATEGY #WQP4: [provided to CRAM working group]
Improve understanding of physical and chemical oceanographic processes and cycles, with a focus on phenomena that injure natural resources.

WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

Contribute to regional and national efforts to characterize and document changes to natural oceanographic conditions, cycles and perturbations

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:

ACTIVITY A: Continue monitoring of nearshore water characteristics using instrumented buoys and other technology.

ACTIVITY B: Participate in regional and national collaborations to research and monitor water quality, ocean conditions, and impacts to natural resources.



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ACTIVITY C: Support and contribute to improvements in use of satellite imagery to monitor oceanographic conditions, including real-time assessment, hind-cast analyses and future predictions, and facilitated access to imagery data

PARTNERS: Hoh, Makah, and Quileute tribes and Quinault Nation, coastal communities, Outer Coast Marine Resources Committee, Washington state, Olympic National Park, and non-governmental organizations

RESOURCES:

- **Staff time**
- **Funds for travel**

WILDLIFE DISTURBANCE STRATEGIES

I. INTRODUCTION

Washington state's outer coast, particularly the northern portion, is recognized for its unique and abundant wildlife, relatively undeveloped condition, and productive ecosystem through state and federal designations – Washington Seashore Conservation Area, Olympic National Park's coastal strip, Washington Islands National Wildlife Refuges, and Olympic Coast National Marine Sanctuary. These extraordinary natural values were acknowledged and protected as early as 1907 when seabird colonies on the coast's islands were first granted Federal conservation protection under a seabird reserve system by President Theodore Roosevelt.

The phrase 'wildlife disturbance' encompasses both acoustic and visual disturbances caused by human activities that can have physical and behavioral impacts on wildlife above, below and on the water surface. Overt responses of fish and wildlife species to disturbance include flushing birds from their nesting roosts, flushing of marine mammals from haul out areas, or even death. Sources of wildlife disturbance in OCNMS could include low-flying aircraft, motorized personal watercraft, fireworks, close approach to wildlife aggregation areas (either humans on foot or in a vessel) and other excessive anthropogenic noises that could originate from shipping, military exercises, or seismic exploration. Research has documented variability in disturbance distances and responses based on differing activities and vessel types, as well as the species affected. In marine areas, these data have supported protective regulations to establish approach limits, speed restrictions and buffer zones around sensitive wildlife assemblages or habitats. Wildlife disturbance also can be minimized through outreach to expand citizen familiarity with issues and to encourage appropriate behaviors. Monitoring and enforcement support evaluation of the effectiveness of regulatory and/or outreach actions.

Draft revised goals and objectives for OCNMS's revised management plan were reviewed and approved for consideration by working groups at the AC's September 2009 meeting. These include the following guidance relevant to wildlife disturbance:

Goal E. Maintain the Sanctuary's natural biological diversity and protect, and where appropriate, restore and enhance Sanctuary ecosystems.

Objective 1: Work collaboratively with strategic partners to conserve natural habitats, populations, and ecological processes by preventing, minimizing and/or mitigating stressors on resources in the Sanctuary.



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Strategies and activities outlined in this document were developed initially from recommendations provided at a 21 August 2009 meeting of the LRC working group. Additional ideas were provided in comments received during the public scoping period and through discussions within the Office of National Marine Sanctuaries and West Coast Region national marine sanctuaries. These sources formed the basis of a preliminary document that was discussed on a conference call on 26 October 2009 attended by a self-selected subgroup of the LRC working group - Teresa Scott and Steve Jeffries (WDFW), George Hart (US Navy), Brent Norberg (NMFS, Protected Resources), Deanna Lynch (USFWS), Rich Osborne (Clallam County), Fred Felleman (representing Makah Office of Marine Affairs and Friends of the Earth), Jeff Wells (Rite Bros Aviation), and Liam Antrim, Mary Sue Brancato and Ed Bowlby (OCNMS).

II. RECOMMENDED STRATEGIES & ACTIVITIES

STRATEGY #WD1: Support and improve recognition of and compliance with the existing OCNMS wildlife disturbance mitigation (overflight restriction zone).

WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

Minimize disturbance to wildlife by low-flying aircraft

RECOMMENDED ACTIVITIES TO ACHIEVE THIS STRATEGY:

ACTIVITY A: Improve compliance with the OCNMS wildlife disturbance mitigation (overflight restriction zone) through collaboration with Aircraft Owners and Pilots Association (AOPA) and Washington Pilots Association (WPA) to improve outreach products and communication with local pilots.

ACTIVITY B: Develop education and orientation materials on the OCNMS wildlife disturbance mitigation (overflight restriction zone) and associated wildlife disturbance issues that are useful for regional enforcement officers. Organize and conduct regular training sessions for regional enforcement officers.

ACTIVITY C: Conduct outreach and training for local residents, enforcement officers, researchers, and others who frequent the outer Washington coast to encourage monitoring for and reporting of potential overflight violations and wildlife disturbance responses.

ACTIVITY D: Maintain the OCNMS incident database to record times, locations, and other information for reported overflight violations, as well as permitted and



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exempted low altitude flights. Share incident database information with regional enforcement officers, permitting staff and concerned management entities to foster support for the OCNMS wildlife disturbance mitigation.

ACTIVITY E: Support efforts by the Office of National Marine Sanctuaries to have the OCNMS wildlife disturbance mitigation (overflight restriction zone) posted on Federal Aviation Administration (FAA) aeronautical charts.

PARTNERS: Hoh, Makah, and Quileute tribes and Quinault Nation, Olympic National Park, U.S. Fish and Wildlife Service, Washington State Parks and Recreation Commission, Washington Department of Fish and Wildlife, U.S. Coast Guard, U.S. Navy, Aircraft Owners and Pilots Association (AOPA), Washington Pilots Association (WPA), National Marine Fisheries Service, coastal communities, regional airports

RESOURCES:

- Staff time
- Printing expenses for outreach and training materials
- Travel expenses for staff

STRATEGY #WD2: Promote public understanding of wildlife disturbance issues through education and outreach programs.

WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

Minimize disturbance to wildlife through enhanced public understanding of impacts of human behaviors on wildlife

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:

ACTIVITY A: Collaborate with regional wildlife management agencies to develop wildlife viewing guidelines addressing shore-based and vessel activities. Produce and distribute outreach products that address wildlife viewing guidelines.

ACTIVITY B: Collaborate with management agencies, area users and programs (e.g., NOAA Ocean Etiquette and Watchable Wildlife) and to conduct outreach for specific user groups, such as charter fishing and wildlife viewing operators, kayakers and surfers, to improve public understanding of the impacts of wildlife



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disturbance by human behaviors on wildlife activities, and to promote best practices, guidelines and regulations that benefit wildlife, reduce disturbance, and enhance human enjoyment of natural resources.

ACTIVITY C: Collaborate in training for regional interpreters, rangers, enforcement staff and volunteers related to wildlife disturbance.

ACTIVITY D: Improve the OCNMS web site content related to visitor appreciation of wildlife and disturbance by human activities.

ACTIVITY E: Maintain the OCNMS incident database to record times, locations, and other information for reported wildlife disturbance events.

PARTNERS: Hoh, Makah, and Quileute tribes and Quinault Nation, Olympic National Park, U.S. Fish and Wildlife Service, Washington State Parks and Recreation Commission, Washington Department of Fish and Wildlife, Coastal Observation and Seabird Survey Team, Washington Clean Coast Alliance; outer coast marine resource committees (Grays Harbor and North Pacific Coast), Surfrider, National Marine Fisheries Service, Westport Charterboat Association, regional port authorities and marina facilities, coastal communities

RESOURCES:

- Staff time
- Printing expenses for outreach and training materials
- Travel expenses for staff

STRATEGY #WD3: Continue participation in the Northwest Marine Mammal Stranding Network

WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

Enhance response, investigation, and data collection on all beached and stranded marine mammals to assess factors affecting the health of local marine mammal populations, and where possible determine whether human interactions contributed to stranding events.

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:



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ACTIVITY A: Collaborate with other Network participants, share information and resources to promote timely response and investigation of stranding events, to minimize direct interactions between with humans and domestic animals, to maximize collection of baseline data, and to improve the detection of signs of human interactions that may contribute to stranding events.

ACTIVITY B: Encourage additional regional partners, such as U.S. Coast Guard and spill response organizations, to assist with response and have increased participation in the Network.

ACTIVITY C: Assist with collection and transport of biological specimens and tissues from marine mammals for examination.

ACTIVITY D: Collaborate with NOAA Fisheries during the ongoing development of the Northwest Regional Annex to a Memorandum of Agreement between NOAA Fisheries and the U.S. Navy for the enhancement of the Marine Mammal Health and Stranding Response Program.

PARTNERS: Marine Mammal Stranding Network; Hoh, Makah, and Quileute tribes and Quinault Nation, Olympic National Park, U.S. Fish and Wildlife Service, Washington State Parks and Recreation Commission, Washington Department of Fish and Wildlife, Coastal Observation and Seabird Survey Team, outer coast marine resource committees (Grays Harbor and North Pacific Coast), NOAA Fisheries (National Marine Fisheries Service), U.S. Coast Guard, coastal communities

RESOURCES:

- Staff time

OTHER TOPICS DISCUSSED WITHOUT RESOLUTION ABOUT THE NEED FOR TARGETED STRATEGIES AND ACTIVITIES

- Evaluate the OCNMS overflight altitude restriction, which limits unpermitted flights within 1 nautical mile of shore to 2000 feet and above, and determine if a different altitude floor is appropriate. One participant suggested that OCNMS could support the 2000' altitude advisory that applies to Department of Interior lands (national parks and wildlife refuges), and modify the OCNMS regulation to have a lower limit of 1000'. This lower altitude is adequate for avoidance of marine mammal and seabird



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disturbance (based on field observations) and consistent with other West Coast sanctuaries, but may not be consistent with a wilderness aesthetic.

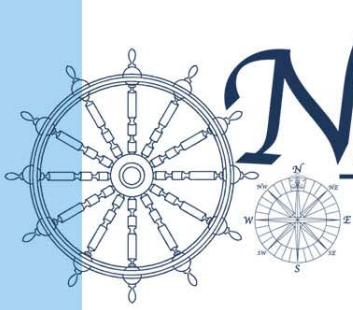
- **Copalis Beach Airport** – In 1951 Grays Harbor County commissioners passed a resolution to designate a landing area for light aircraft between the Copalis River and north approximately one mile to the rocks. The landing area was included in the North Beach Recreational Management Plan submitted by Grays Harbor County and approved by the Washington State Parks and Recreation Commission (WSPRC). The airport is under the jurisdiction of the Department of Transportation (WSDOT) Aviation Division. This is the only public beach airstrip in the lower 48 states. This beach is in the Washington Seashore Conservation Area, not within the Sanctuary. At this location, the sanctuary boundary is subtidal (mean lower low water). At sanctuary scoping meetings, local residents raised safety and wildlife disturbance concerns associated with this beach landing area. In 2009, WSPRC has been conducting land-use planning for North Beach area state parks (including Ocean City, Pacific Beach, Griffiths-Priddy and Damon Point the Seashore Conservation Area) in Grays Harbor County. Use of the Copalis Beach Airport is being addressed through this process. Under development is a draft State-Managed Airport Handbook that identifies proposed operation procedures and best management practices.

STRATEGIES TO FORWARD TO OTHER ADVISORY COUNCIL WORKING GROUPS

CRAM WORKING GROUP STRATEGY: Monitor the underwater acoustic environment in the Sanctuary to establish a baseline for background noise, including military activities and elevated noise levels potentially associated with shipping traffic near the western entrance to the Strait of Juan de Fuca

CRAM WORKING GROUP STRATEGY: Evaluate the collection of shipping data and large whale distribution within the sanctuary to support of future risk analysis for large whale collisions with ships. Document and monitor shipping traffic and evaluate shipping lane traffic and large whale distribution. Engage Navy and USCG to provide whale distribution data from platforms of opportunity

SPILLS WORKING GROUP STRATEGY: Shipping traffic in the northern portion of the Sanctuary is well documented and monitored but not in the southern sanctuary where radar coverage is lacking. AIS data should be archived. Vessel traffic data needs to be archived.



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HABITAT PROTECTION STRATEGIES

I. INTRODUCTION

The phrase 'habitat protection' is used here to reference actions taken to prevent, mitigate, or eliminate degradation of marine habitats in the sanctuary. Such actions are supported by research and monitoring to improve our understanding of functions and values of marine habitats, to document how, when and where degradation of habitats occurs, and to evaluate the effectiveness of the management actions. In addition, habitat protection actions can be reinforced through outreach to expand citizen familiarity with issues and to encourage actions that individuals and organizations can take to minimize impacts to habitats. A fundamental premise of habitat protection initiatives is that healthy habitats support healthy populations and communities, including exploited fishery resources. Although the focus of the LRC working group's recommendations should be on protection of marine habitats, this group considered recommendations for research, monitoring and outreach actions that support habitat protection.

Draft revised goals and objectives for OCNMS's new management plan were reviewed and approved for consideration by working groups at the AC's September 2009 meeting. These include this goal and objective relevant to habitat protection:

Goal E. Maintain the Sanctuary's natural biological diversity and protect, and where appropriate, restore and enhance Sanctuary ecosystems.

Objective 1: Work collaboratively with strategic partners to conserve natural habitats, populations, and ecological processes by preventing, minimizing and/or mitigating stressors on resources in the Sanctuary.

Strategies and activities outlined in this document were developed initially from recommendations provided at a 21 August 2009 meeting of the LRC working group. Additional ideas were provided in comments received during the public scoping period. These sources formed the basis of a preliminary document that was discussed on a conference call on 8 October 2009 attended by a self-selected subgroup of the LRC working group - Teresa Scott (WDFW), Ben Enticknap (Oceana), Joe Schumacker (Quinalt Natural Resources), Jennifer Hagen (Quileute Natural Resources), Steve Joner (Makah Fisheries), Joe Gilbertson (Hoh Natural Resources), Rich Osborne (Clallam County), and Liam Antrim, Mary Sue Brancato, Ed Bowlby, Lauren Bennett, and George Galasso (OCNMS).

II. RECOMMENDED STRATEGIES & ACTIVITIES

STRATEGY #HP1:

Assess existing and potential human-caused threats to physical and biogenic marine habitats (e.g., deep sea coral/sponge, kelp and other macroalgae), and collaborate in development of appropriate management measures to protect and conserve physical and biological habitats.

WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

Minimize and mitigate for human-caused degradation of marine habitats

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:

ACTIVITY A: Continue to support and conduct monitoring and assessment of biogenic habitats to detect change and impacts from human activities.

ACTIVITY B: Consult and collaborate with regional management authorities and collect public comment on existing and potential impacts, threats and relative vulnerability of physical and biogenic habitats, potential management measures, and monitoring recommendations.

ACTIVITY C: Collaborate with local and regional management authorities and other partners to develop, and/or recommend and implement management measures that minimize and mitigate degradation of marine habitats.

ACTIVITY D: Monitor the rates of recovery of disturbed habitats disturbed by human activities, their associated biological communities, and habitat-forming biogenic structures from impacts by human activities.

ACTIVITY E: Collaborate with Olympic National Park to designate intertidal reserve areas as identified in the Park's 2008 General Management Plan.

PARTNERS: Hoh, Makah, and Quileute tribes and Quinault Nation, Olympic National Park, NOAA Fisheries and other NOAA branches, U.S. Fish and Wildlife Service, Washington State departments of Fish and Wildlife and Natural Resources, Pacific Fishery Management Council, academic organizations, Department of Fisheries and Oceans Canada, local governments, coastal communities and non-governmental organizations



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RESOURCES:

- Staff time
- Travel funds for PFMC meetings
- GIS capability
- Funding and ship time for research/monitoring cruises

STRATEGY #HP2: Identify habitats of special importance and collaborate with co-managers to identify and implement management measures necessary for protection of these critical habitats and areas.

WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

Comprehensive knowledge of habitat requirements of ecologically, recreationally and commercially important species, and protection of these special habitats

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:

ACTIVITY A: Continue collaborations with regional natural resource co-managers to identify habitat types of special importance to ecosystem function or harvested species; identify the locations of such habitats.

ACTIVITY B: Collaborate with regional natural resource co-managers to develop potential management strategies and to implement management strategies for protection of special habitats.

PARTNERS: Hoh, Makah, and Quileute tribes and Quinault Nation, Olympic National Park, NOAA Fisheries and other NOAA branches, U.S. Fish and Wildlife Service, Washington State departments of Fish and Wildlife and Natural Resources, Pacific Fishery Management Council, local governments, Marine Resource Committees

RESOURCES:

- Staff time
- Travel funds for meetings
- GIS capability



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STRATEGY #HP2

Participate in regional and national processes through which habitat protection measures are being considered or evaluated.

WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

Protect habitats with demonstrated high value to ecosystem functions and productivity and/or habitats that are vulnerable to human disturbance

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:

ACTIVITY A: Continue participation in PFMC processes, including identification of essential fish habitat (EFH) and habitat areas of particular concern (HAPC) through OCNMS representation on the EFH Review Committee.

ACTIVITY B: Collaborate with co-managers to identify locations, and characterize ecosystem values of biogenic habitats in the Sanctuary; explore opportunities and collaborate in development of management measures for protecting biogenic habitats in the Sanctuary.

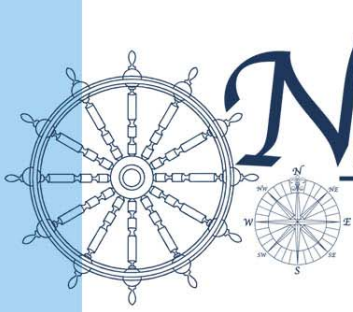
ACTIVITY C: Collaborate and participate with PFMC, NOAA and other partners in deep sea coral research and conservation efforts.

ACTIVITY C: Collaborate to develop HAPC site and EFH conservation area recommendations, evaluate these recommendations, and forward OCNMS recommendations to appropriate forums for consideration.

PARTNERS: Pacific Fishery Management Council, Hoh, Makah, and Quileute tribes and Quinault Nation, NOAA Fisheries, Washington State Department of Fish and Wildlife, coastal communities and non-governmental organizations

RESOURCES:

- Staff time
- Travel funds for PFMC meetings
- GIS capability



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STRATEGIES AND ACTIVITIES DEVELOPED FROM THE 21AUG09 LRC MEETING TO BE FORWARDED TO OTHER AC WORKING GROUPS

STRATEGY #A: (forward to CRAM WG; include continued support for kelp monitoring)
Continue to conduct and collaborate in habitat mapping, characterization, and condition assessment efforts, with a focus on seafloor and biogenic habitats, including cold water corals, reef forming sponges, and kelp.

STRATEGY #B: (forward to CRAM WG)
When technologically feasible, conduct species distribution and abundance assessment during habitat characterization efforts.

STRATEGY #C: (forward to CRAM WG and biodiversity/cross cutting issues WG)
Collaborate in studies to improve understanding of the distribution and condition of marine habitats and their contribution to preservation of natural biodiversity, as well as their contribution to sustainable production of fishery resources.

STRATEGY #D: (forward to CRAM WG)
Contribute to regional efforts to monitor use of nearshore, intertidal, and estuarine habitats by forage fish, salmonids, and threatened and endangered species.

STRATEGY #E: (forward to CRAM WG)
Make habitat data readily available and in a format useful to resource managers and the public. *Note: consider making this more directed: make habitat data available in GIS format as well as other formats such as interactive maps on OCNMS web site.*

STRATEGY #F: (forward for consideration in Sanctuary Operations Action Plan)
Increase ecosystem protection through compliance with sanctuary regulations and other applicable state and federal statutes.

ACTIVITY A: Seek to increase law enforcement presence in the Sanctuary through adequate funding of resources dedicated to the sanctuary's resource protection mission

ACTIVITY B: Foster partnerships with local law enforcement entities.



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STRATEGY #G: Collaborate in regional efforts to develop innovative fishing gear designs that reduce impacts to marine habitats and biodiversity.

STRATEGY #H: Consideration of non-tribal kelp harvest restrictions.

STRATEGY #I: Acoustic habitat considerations.

BIODIVERSITY AND OTHER CROSS-CUTTING ISSUE STRATEGIES

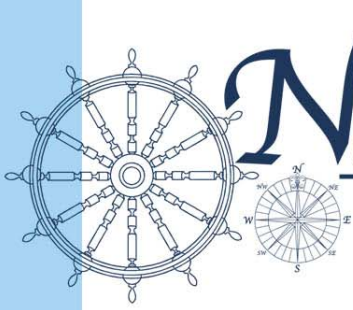
I. INTRODUCTION

The biodiversity/cross-cutting topics focal area was identified as a forum to address conservation oriented topics that did not distinctly align with other LRC focal areas but should be considered in development of OCNMS's revised management plan. Also supporting this work is the mission statement for NOAA's National Marine Sanctuaries - to serve as trustee for the nation's marine protected areas to conserve, protect and enhance the biodiversity, ecological integrity, and cultural legacy of these ecosystems.

According to Wikipedia, biodiversity, or biological diversity, is most commonly defined by biologists as "the totality of genes, species, and ecosystems of a region." This definition captures the three levels at which biodiversity has been identified – genetic, species, and ecosystem. A simpler definition is "variation of life at all levels of biological organization." From a quantitative perspective, there are several indices traditionally used to measure biodiversity that account for the number of species (richness) and relative abundance of different species (evenness).

During public scoping, OCNMS received numerous comments that identified protection or conservation of biodiversity as a high priority goal for management. Some comments specifically stated that OCNMS should monitor for and/or quantify biodiversity, which is potentially a daunting task. Most comments emphasized the importance of biodiversity conservation in the context of habitat protection, contribution to sustainable fisheries, and maintenance of ecological resilience, which is defined as the capacity of an ecosystem to tolerate disturbance without collapsing into a qualitatively different state that is controlled by a different set of processes. Ecological resilience recently has been discussed as a property important for mitigation of effects anticipated from climate change. The basic premise is that in a biologically rich and productive area like the outer coast of Washington state, preservation of healthy habitats and ecosystem-based fisheries management can support diverse and abundant populations and communities, which in turn support sustainable fisheries and provide an ecological system that can tolerate and persist in the face of natural and man-induced disturbances. Biodiversity can not be protected if habitats are extensively altered and extractive activities cause an imbalance to the ecosystem.

Given its links to numerous aspects of the ecosystem, protection of biodiversity is inherently a cross-cutting issue. Other topics potentially of importance to management of the sanctuary may not be exclusively the purview of research, education, or resource protection, and these can be considered cross-cutting issues.



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Draft revised goals and objectives for OCNMS's new management plan were reviewed and approved for consideration by working groups at the AC's September 2009 meeting. These include this goal and objective relevant to habitat protection:

Goal E. Maintain the Sanctuary's natural biological diversity and protect, and where appropriate, restore and enhance Sanctuary ecosystems.

Objective 1: Work collaboratively with strategic partners to conserve natural habitats, populations, and ecological processes by preventing, minimizing and/or mitigating stressors on resources in the Sanctuary.

Strategies and activities outlined in this document were developed initially from recommendations provided at a 21 August 2009 meeting of the LRC working group. Additional ideas were provided in comments received during the public scoping period or strategies developed by other AC working groups. These sources formed the basis of a preliminary document that was discussed on a conference call on 10 November 2009 attended by a self-selected subgroup of the LRC working group – Eric Wilkins (NWIFC), Jody Kennedy (Surfrider), John Woolley (Olympic Coast Alliance), Jacques White (The Nature Conservancy), and Liam Antrim, Ed Bowlby, George Galasso, and Lauren Bennett (OCNMS).

II. RECOMMENDED STRATEGIES & ACTIVITIES

STRATEGY #CC1: Collaborate in rapid response to unusual and significant natural resource events.

Background: The algal blooms that caused high mortality in seabirds in the fall of 2009 demanded a substantial and collaborated response to 1) assess the distribution and scale of seabird mortality, 2) monitor and sample water, biota, and other parameters, 3) to determine the probable cause of seabird mortality, 4) rehabilitate stressed but viable seabirds, and 5) analyze data and satellite imagery to assess the distribution and potential persistence of conditions leading to the event. Although this event has not been identified clearly as a repercussion of climate change and, therefore, may not represent something we must anticipate on a regularly basis, regional natural resource managers can expect future events that will require a coordinated response by agency personnel and volunteers. This strategy is intended to support future emergency response efforts to natural events.



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WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

Regional capacity to implement a collaborative and effective response to unusual natural resource events

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:

ACTIVITY A: Develop, maintain, and share a current list of research and resource management contacts from regional natural resource management agencies, including Coastal Treaty Tribes, federal and state agencies.

ACTIVITY B: Maintain a volunteer network database of individuals and organizations that can assist in emergency response activities. Provide opportunities for appropriate volunteer training.

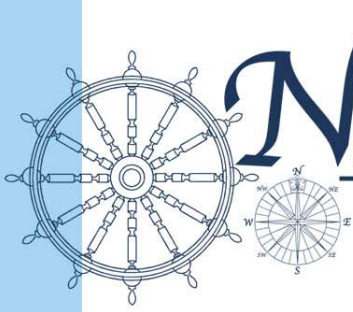
ACTIVITY C: Collaborate with regional natural resource management agencies to develop a response strategy and/or plan for unusual natural resource events.

PARTNERS: Hoh, Makah, and Quileute tribes and Quinault Nation, Olympic National Park, NOAA Fisheries and other NOAA branches, U.S. Fish and Wildlife Service, Washington State departments of Fish and Wildlife, Ecology and Natural Resources, academic organizations, Department of Fisheries and Oceans Canada, local governments, coastal communities and non-governmental organizations

RESOURCES:

- Staff time
- Funding for travel, equipment purchases, sample/specimen shipment

Note: Strategies CC2 and CC3 were developed by the LRC working group and forwarded to other working groups. The Collaborative Research and Monitoring working group had not finalized recommendations when this document was completed, so a comparison of similar recommendations from two working groups could not be completed. This does not present a problem, however, because in development of action plans, OCNMS staff can align similar recommendations from more than one working group.



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STRATEGY #CC2: Understand impacts of climate change, including ocean acidification, on water quality in order to develop an approach for adaptation.

WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

Collaboration with partners to enhance our understanding of impacts to water quality caused by climate change, and to share this understanding with regional communities.

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:

ACTIVITY A: Continue to conduct and collaborate in regional and national efforts to identify marine chemical, physical, and biological indicators of climate change and to monitor these indicators in waters of the Sanctuary.

ACTIVITY B: Make climate change monitoring data collected by OCNMS readily available to other resource managers and interested parties.

ACTIVITY C: Work with partners to develop and understand projections for local sea level rise and impacts to marine habitats and natural and cultural resources.

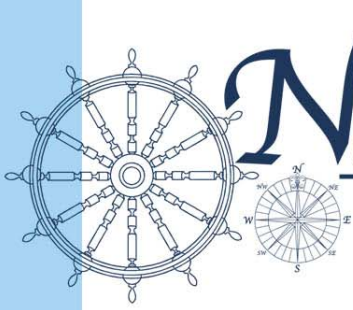
ACTIVITY D: Collaborate in development, evaluation, and implementation, as appropriate, of potential management responses to climate change impacts on the marine environment.

ACTIVITY E: Conduct public outreach and provide information about potential and quantifiable impacts of climate change to the public.

PARTNERS: Hoh, Makah, and Quileute tribes and Quinault Nation, Washington State Department of Ecology, WDFW, local governments, UW Climate Impacts Group, NOAA/PMEL, West Coast Regional Sanctuaries, Monterey Bay Research Institute, Federal-level climate workgroups?, Outer Coast Marine Resources Committee, U.S. Fish and Wildlife Service, Olympic National Park, NOAA Ocean Services, and non-governmental organizations.

RESOURCES:

- Staff time
- Travel funds for regional meetings
- GIS capability



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STRATEGY #CC3:

Reduce the potential for introduction of invasive species, monitor distributions of known invasive species, and support programs to mitigate impacts of invasive species to natural and cultural resources.

WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

Prevent, minimize, and mitigate impacts of invasive species

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:

ACTIVITY A: Through OCNMS resource protection and outreach programs, support the work of Washington State Department of Fish and Wildlife and other agencies to prevent introduction of invasive species

ACTIVITY B: Continue to conduct and collaborate in regional efforts to monitor for the presence, distribution, and ecological and economic impacts of invasive species. Engage volunteer monitoring in this effort, where appropriate.

ACTIVITY C: Support regional efforts to reduce ecological and economic impacts of invasive species

PARTNERS: Hoh, Makah, and Quileute tribes and Quinault Nation, coastal communities, Outer Coast Marine Resources Committee, Washington State Department of Fish and Wildlife, Washington Invasive Species Council, Olympic National Park, Washington Islands National Wildlife Refuge, and non-governmental organizations

RESOURCES:

- Staff time
- Travel funds

STRATEGY #CC4:

Participate in regional planning processes for ocean project developments in or immediately adjacent to the sanctuary.



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WHAT IS THE DESIRED OUTCOME OF THIS STRATEGY?

Ensure that natural and cultural resources and sanctuary regulations are considered and protected in planning for projects in and adjacent to the sanctuary

ACTIVITIES NECESSARY TO ACHIEVE STRATEGY:

ACTIVITY A: Support regional planning processes and site evaluations for proposed development projects in or immediately adjacent to OCNMS through use of natural and cultural resource information to avoid, minimize, and mitigate user conflicts and impacts to habitats and natural and cultural resources.

ACTIVITY B: If projects are proposed in OCNMS, participate in scoping the research and monitoring needs, and collaborate in research and monitoring to assess project impacts to habitats, natural and cultural resources, and other area users.

PARTNERS: Hoh, Makah, and Quileute tribes and Quinault Nation, Department of Interior (National Parks, U.S. Fish and Wildlife Service), NOAA Fisheries, Washington State department of Fish and Wildlife, Natural Resources, and Ecology, local governments, coastal communities and non-governmental organizations

RESOURCES:

- Staff time
- Travel funds for regional meetings
- GIS capability

Note: the following topic was raised at the 21Aug09 meeting. A subgroup participant noted that this topic was not addressed in strategies/activities outlined above.

STRATEGY J: Collaborate in studies to understand and protect the marine food web.

This could include the identification and conservation of spawning areas for forage species, monitoring, and development of recommendations to protect forage species not currently managed by NOAA Fisheries or the State.



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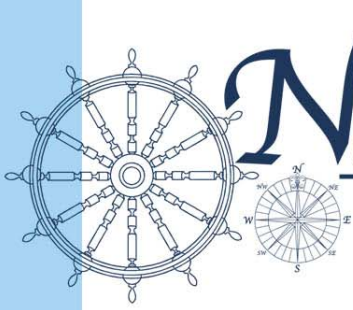
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Note: the following draft strategy language was developed by the habitat protection subgroup under the LRC working group, with the recommendation that it be forwarded to working groups addressing research/monitoring/assessment and cross-cutting topics.

STRATEGY K: Collaborate in studies to improve understanding of the distribution and condition of marine habitats and their contribution to preservation of natural biodiversity, as well as their contribution to sustainable production of fishery resources.



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BACKGROUND INFORMATION - BIODIVERSITY AND CROSS-CUTTING EXAMPLES FROM OTHER NATIONAL MARINE SANCTUARY ACTION PLANS

Biodiversity has been mentioned and addressed to varying degrees in recently updated management plans from other U.S. national marine sanctuaries. Most focus on monitoring to improve understanding of species presence, abundance, and trophic interactions, protection of sensitive habitats, zoning to minimize widespread disturbance, and collaborative implementation of ecosystem-based management. The following is a sampling from these management plans.

Gulf of the Farallones NMS

STRATEGY EP-1: Develop a resource protection plan (policy) to minimize user conflicts and provide special areas of protection for sensitive habitats, living resources, and other unique sanctuary features.

Channel Islands NMS

STRATEGY RP.3: General Marine Zoning *Objective:* To consider the use of marine zoning as a tool to protect and enhance biodiversity and manage various uses of the Sanctuary.

Stellwagen Bank NMS

This draft management plan has a 12 page section that reviews the topic of biodiversity conservation (<http://stellwagen.noaa.gov/management/mpr/draftplan.html>). This document describes three fundamental concepts related to biodiversity conservation: historical baselines, trophic interactions, and habitats. Several strategies and activities in SBNMS's draft management plan are related to conservation of biodiversity, including strategies related to reducing impacts to and alteration of habitats. Strategies and activities most directly related to biodiversity are addressed as Ecosystem-Based Sanctuary Management (EBSM) and Ecosystem Alteration (EA).

Ecosystem-Based Sanctuary Management

EBSM.3 Understand Ecosystem Structure and Function

- (3.1) Define and operationalize the term ecological integrity.
- (3.2) Develop programs to monitor and evaluate ecological integrity within the sanctuary.
- (3.3) Establish research programs directed at informing EBSM.
- (3.4) Develop models that afford a predictive capability to better understand sanctuary dynamics and to guide EBSM.



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EBSM.4 Protect Ecological Integrity

- (4.1) Continue to convene the zoning working group of the advisory council to: (1) evaluate the adequacy of existing zoning schemes in SBNMS, (2) address the scientific requirements to meet the goals of EBSM, and if needed (3) develop a modified zoning scheme including consideration of fully protected reserves.

Ecosystem Alteration

EA.1 Reduce Ecological Impacts from the Laying of Submarine Cables and Pipelines

- (1.1) Establish minimum criteria for special use permit applications for the laying of cables and pipelines.

EA.2 Reduce Alteration of Benthic Habitat by Mobile Fishing

- (2.1) Develop a process to establish reference areas that serve as benchmarks for discerning human and natural impacts on habitat alteration.
- (2.2) Develop a science plan to assess and mitigate benthic habitat alteration.

EA.3 Reduce Ecological Impacts of Biomass Removal by Fishing Activity

- (3.1) Minimize bycatch and discard of all species, in all fisheries (commercial and recreational), by all gear types.
- (3.2) Determine the effects of biomass removal of targeted species by commercial and recreational fishing on the ecological integrity of the sanctuary.
- (3.3) Develop a management strategy with NOAA Fisheries Service and the NEFMC to evaluate and protect an optimal forage base to maintain the ecological integrity of the sanctuary.

Gray's Reef NMS

This national marine sanctuary is centered on a large, subtidal, nearshore rocky reef located 17.5 nautical miles off Georgia. Its management plan includes a Marine Resource Protection Action Plan focusing on protection of benthic habitats, removal of marine debris, fishing gear type restrictions to increased protections for fish and invertebrates, enhanced enforcement, and enhanced coordination with co-management authorities.