Marine Protected Areas
in Washington

Recommendations of the Marine Protected Areas Work Group to the Washington State Legislature

December 2009

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F. Brie Van Cleve
Greg Bargmann
Michele Culver
The MPA Work Group

Washington Department of Fish and Wildlife
600 Capitol Way North
Olympia, Washington
98501

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ACKNOWLEDGEMENTS

This report is the culmination of a year of meetings of the MPA Work Group to define and develop recommendations for marine resource management through marine protected areas in Washington State. WDFW and the MPA Work Group acknowledge the support of the Legislature for completion of this task.

MPA Work Group members generously dedicated their time and expertise to compiling the MPA inventory, developing recommendations, and presenting the result in this report. A list of MPA Work Group members appears in Table 1. Michele Culver served as the WDFW Director's designee to chair the MPA Work Group, Brie Van Cleve served as the MPA Work Group coordinator, and Greg Bargmann lead the compilation of the MPA inventory.

Additional WDFW staff members who contributed to the development of the inventory and associated maps include Debbra Bacon, Dale Gombert, Greg Lippert, David Bramwell, Debbie Farrer, Suzi Reczcznski, Colleen Desselle, and Greg Konkel. Brian Hovis and Kathryn Scott, Washington Parks and Recreation Commission, also provided essential information used to develop the inventory. Doug Balthus, Washington Department of Ecology, and Wayne Palsson, Washington Department of Fish and Wildlife, contributed to this report with information about the MPA monitoring activities of their respective agencies. Finally, WDFW gratefully acknowledges the editorial services provided by WDFW staff members Corey B. Niles and Jair Reitsma.

EXECUTIVE SUMMARY

Marine Protected Areas (MPAs) are one management tool that may be used to protect and conserve fragile or unique habitats, species and culturally historic sites, enhance fisheries abundance and biodiversity, and provide recreational and educational opportunities while potentially assisting ecosystem-based management. Washington State hosts a variety of MPAs with ranging degrees of protection established for diverse purposes by several different entities. Most of the designations occurred before the term MPA was put into use and these sites are known by a variety of terms including aquatic reserves, marine preserves, conservation areas, etc. The resulting patchwork of protection is confusing to marine resource regulators and users, makes evaluation of success difficult, may create conservation gaps or overlaps and, in some cases, may be insufficient to protect marine ecosystems.

Washington is home to 127 MPAs managed by eleven federal, state, and local agencies. These sites occur in Puget Sound and on the coast and cover approximately 644,000 acres and over six million feet of shoreline. The median size of an MPA in the state is slightly over 23 acres, although the size ranges from less than one acre to over 300,000 acres. The first MPA in the state was created in 1907 but most MPAs were established during the 1960s. The greater San Juan Island area (San Juan archipelago) holds the most MPAs. Meanwhile the northern portion of the Washington coast contains the fewest MPAs in number, yet the North Coast is home to the state's single largest MPA, the Olympic Coast National Marine Sanctuary. Between 1 to 5% of the Puget Sound and coastal region (excluding the greater San-Juan Island area and North Olympic Coast) is covered by an MPA. Almost all MPAs restrict harvest or other impacts to marine resources to some degree.

The MPA Work Group was established by the Washington State Legislature in 2008 and tasked to inventory MPAs in Washington's state waters, assess current MPA management, and provide a series of recommendations to the Legislature on how to improve the use and effectiveness of MPAs in the future. The MPA Work Group was chaired by WDFW and populated with governmental representatives, including tribal representatives, and agencies that manage MPAs in Washington's state waters. Treaty tribes were invited to participate because they have co-management authority over the treaty-reserved fishery resources within their usual and accustomed fishing grounds. Treaty tribes also have a management interest in the habitats required to sustain their treaty-reserved harvest. The MPA Work Group oversaw the compilation of an inventory of Washington MPAs between December 2008 and October 2009 while participating in a series of meetings used to collect information about varying aspects of MPAs.

Through this process, the MPA Work Group noted the various degrees of protection afforded by MPAs in the inventory. The group agreed that performance evaluation of existing MPAs was needed to determine whether existing MPA authorities provided adequate ecosystem protection or whether agencies were implementing existing authorities effectively and managing MPAs efficiently. Once performance of the current suite of MPAs was assessed, the MPA inventory and additional supporting information could be used to assess gaps in the current marine resource conservation landscape.

The group agreed that networks of MPAs are a potentially valuable tool to achieve ecosystem-based management and concluded that MPAs sited and designed separately and individually rarely achieve ecosystem-based management principles. The group noted that marine spatial planning, for which there is strengthening national interest, is another tool to inform ecosystem-based management. In a comprehensive planning process, areas for marine conservation, or MPAs, could be recommended and established. The group agreed that principles and practices associated with science based MPA establishment criteria and management could be applied during marine spatial planning efforts. The MPA Work Group found that Marine Stewardship Areas (MSAs) offer both non-regulatory and regulatory tools to involve local government, nongovernmental organizations and communities in creating a framework for ecosystem-based management that can add value to individual MPAs within their borders.

Murray and Ferguson (1998) noted that a variety of MPAs had been created in Puget Sound without an overarching policy, design, or coordination mechanism among managing agencies. Their results document uncoordinated MPA objectives, site selection criteria, design, financing, designation, management, and monitoring and evaluation. The Work Group's findings a decade later largely agree with Murray and Ferguson's documented need for coordination and consistency among MPAs and MPA managers. The MPA Work Group noted that gauging the success of MPAs as a management strategy is dependent on monitoring how well MPAs achieve their management goals and objectives; however, the majority of agencies focus current monitoring activities on the tracking and reporting of marine resource status and not MPA effectiveness. Only WDFW and to a limited extent DNR and OCNMS conduct some MPA effectiveness monitoring.

The following terms are used to describe MPAs included in the inventory: aquatic reserve, refuge, marine preserve, conservation area, park, research reserve, recreation area, and sanctuary. The MPA Work group noted that some terms adequately describe the primary management objective of the MPA, such as "recreation area", while others, such as "sanctuary", do not adequately convey the multitude of management objectives. Further, some terms falsely suggest more protection than others (e.g. WDFW's "marine preserves" are counterintuitively less protective than WDFW's "conservation areas"). The group agreed that the current terminology used to describe various types of MPAs complicates and even frustrates efforts to improve coordination and consistency among MPAs and MPA managers. Lack of consistent terms and use of counterintuitive terms may convey misinformation to the public and stakeholder groups if terminology promotes incorrect assumptions regarding protection levels.

Anticipating a strong likelihood that new MPAs will be proposed in the future, either independently or as part of large-scale marine spatial planning efforts, the group identified the need for a Puget Sound and coast-wide coordinating entity to oversee the implementation of the recommendations in this report, review new MPA proposals, convene MPA managers, and lead coordination efforts. Members

of the MPA Work Group determined that its structure and charge were effective and useful. The group proposed continuance of an MPA Work Group to resolve and review MPA-related issues as they arise.

Based on these findings, the MPA Work Group developed 17 recommendations for improving the use of MPAs as a management tool (Appendix 6). Five recommendations have the most relevance to the Legislature. These recommendations are:

- **Promote coordination between tribes, state and federal agencies, and local jurisdictions in Puget Sound and on the coast relative to existing MPAs and future MPA planning efforts with dedicated support for coordination.**

- **Provide adequate funding source for MPA designation, management and monitoring.**

- **Promote consistent use of MPA-related terms among state MPAs and between state and federal MPAs where possible. Where necessary, change state laws and regulations to reflect a consistent set of terms across multiple agencies.**

- **Conduct a Puget Sound and coast-wide marine conservation needs assessment and gap analysis of existing MPAs and provide recommendations for action.**

- **Identify and monitor reference sites in order to evaluate MPA effectiveness.**

INTRODUCTION

Marine Protected Areas (MPAs) are a type of management tool that has been deployed for a variety of purposes including the conservation of unique or rare marine habitats, culturally and historically important sites, fisheries management, protection of marine biodiversity and recreational enjoyment. MPAs have potential to become valuable components of ecosystem-based management. The term MPA can be used to describe marine areas subject to varying degrees of protection ranging from highly restrictive *marine reserves* and *no take areas* to areas where a few activities are restricted and where recreation is encouraged. The Washington State Legislature defined an MPA as "a geographic marine or estuarine area designated by a state, federal, tribal, or local government in order to provide long-term protection for part or all of the resources within that area."[1]

MPAs can be an effective conservation and management tool when properly designed, effectively managed, and supported by marine resource users and managers (NRC 2001, Allison et al. 1998, Murray et al. 1999, Palumbi 2002, Swain and Dohrmann 2002, Gaydos et al. 2005, PISCO 2007). A 2001 report by the National Research Council (NRC) concluded that MPAs can be effective in maintaining marine biological diversity and protecting habitats, and have the potential to provide a flexible, spatially-based management framework for addressing multiple ecological and socioeconomic objectives. According to the NRC report, closing certain areas to fishing—temporarily, seasonally, or permanently—can advance sustainable fisheries management and provide insurance against uncertainties in fisheries science. However, closing fishing areas is often controversial, and the use of MPAs as a management strategy is not always supported by marine resource users or all agencies with co-management authority of an area or fishery. As with any marine resource management measure, the design, implementation, and management goals of MPAs should be considered in the context of a broader ecosystem management regime and the socio-economic impacts of designation.

Area-based protection can be among the most efficient and cost-effective ways to conserve biological diversity and, in terrestrial systems, reserves are a common, broadly accepted, and effective resource conservation tool (Meffe and Carroll 1994). However, conservation results and lessons about reserve design (size, placement, management, etc.) from terrestrial systems do not transfer readily to marine systems due to the scale and variability of ecological and oceanographic processes and the different life history strategies of marine organisms (Steele 1985). Ecological responses to MPA establishment have been documented by numerous scientific studies in Washington and other temperate marine environments. Responses include greater target species densities, biomass, species size, and species richness within the boundaries of the MPA, replenishment of fish stocks in surrounding areas, increased reproductive rates due to larger fish sizes, increased ecosystem resilience, and reduced risk of population collapse (Palsson and Pacunski 1995, Halpern 2003, Stewart et al. 2008, Palsson et al. 2004, Palsson 1997, Rogers-Bennett and Pearse 2001, NRC 2001). Still, uncertainty lingers regarding MPA effects on specific species and MPA effectiveness in deep water pelagic and soft sediment habitats. Lack of data, especially before-and-after studies, hinders acceptance of MPAs as an effective management strategy with ubiquitous applicability (Halpern 2003, Stewart et al. 2008, Sale et al.

[1] Substitute Senate Bill 6231 (2008)

2005). Studies have historically focused on MPA design considerations such as siting, optimum MPA size, shape, connectivity, and ecosystem responses to protection. Scientists and policy-makers are beginning to focus on new questions about appropriate levels and types of protection needed in each MPA to achieve conservation and management goals (Grober-Dunsmore et al. 2008).

Washington State hosts a variety of MPAs with ranging degrees of protection established for diverse purposes by several different entities. Distinct MPA authorities, goals, criteria for establishment, management practices, and even terminology complicate and inhibit the ability of MPAs to conserve and protect the marine resources of the state. Additionally, uncertainty regarding the efficacy of MPAs at accomplishing management goals remains a barrier to their optimal utilization. Improved coordination among MPA managing agencies and organizations would facilitate the resolution of lingering uncertainty regarding MPA effectiveness. Improved consistency among MPA-related terms, goals, establishment criteria, and management and monitoring practices would improve data and information sharing about the types of marine protection needed in specific locations, the existing legal authorities and best management practices available for deployment, and reduce confusion about the implicit regulations associated with commonly used MPA-related terms.

MPA Work Group Creation, Purpose, and Membership

The MPA Work Group was established by the Washington State Legislature in 2008 and directed to inventory MPAs in Washington's state waters and develop recommendations for how to improve their use as a management tool. This is particularly important in Washington State given diversity of MPA managers and MPA-related terms in use. Specifically, the Legislature tasked the MPA Work Group with providing recommendations for improved coordination and consistency among MPAs and MPA managers regarding MPA goals, criteria for MPA establishment, management and monitoring practices, and terminology. Additionally, the Legislature requested that the MPA Work Group develop recommendations for better integrating science and local governments and nongovernmental organizations (NGOs) into the establishment and management of MPAs. Finally, the Work Group must provide any additional recommendations for improving the effectiveness of MPAs in Washington's state waters.[2] WDFW chaired and staffed the MPA Work Group which was comprised of representatives from governments, agencies, and organizations that manage MPAs and/or co-manage fisheries in Washington's state waters. Table 1 lists MPA Work Group membership.

In August 2008, WDFW issued letters of invitation to participate in the MPA Work Group to Puget Sound and coastal treaty and administrative tribes, federal and state agencies who manage MPAs and/or fisheries in Washington's state waters, Puget Sound and coastal counties, and nongovernmental organizations that manage MPAs in Washington. A second letter was sent in December 2008 to announce the first meeting of the MPA Work Group.

[2] The MPA Work Group was established by Substitute Senate Bill 6231 (2008).

Table 1. MPA Work Group Representation and Membership

Federal	
Steve Fradkin	National Park Service, Olympic National Park
Steve Copps	NOAA Fisheries
Carol Bernthal/Liam Antrim	NOAA Sanctuaries, Olympic Coast National Marine Sanctuary
Kevin Ryan	U.S. Fish and Wildlife Service
Tribal*	
Alan Chapman	Lummi Natural Resources Department
Randy Lumper	Skokomish Tribe
Jennifer Sevigny	Stillaguamish Tribe
Jennifer Hagen	Quileute Tribe
Joe Schumacker	Quinault Indian Nation
Terry Williams/Kit Rawson	Tulalip Tribe
State	
Ginny Broadhurst	Northwest Straits Commission
Chris Townsend	Puget Sound Partnership
Ken Sebens/Terrie Klinger	University of Washington, Friday Harbor Laboratories
Jennifer Hennessey	Washington Department of Ecology
Michele Culver/Brie Van Cleve	Washington Department of Fish and Wildlife
Kyle Murphy/David Palazzi	Washington Department of Natural Resources
Chris Regan	Washington Parks and Recreation Commission
Local government and MRC	
Jody Feldman	Island Marine Resource Committee
Mike Johnson	Pacific County
Mary Knackstedt	San Juan Marine Resource Committee
Heather McCartney	Snohomish Marine Resource Committee
Non-governmental organization	
Jacques White/Eric Delvin	The Nature Conservancy

*Staff of the Northwest Indian Fisheries Commission, including Craig Bowhay, Eric Wilkins, and Fran Wilshusen, provided guidance and suggestions throughout this process, participating in meetings and reviewing documents where possible. The NWIFC did not participate as an official member of the Work Group.

Report Purpose and Audience

The purpose of this report is to convey to the Washington State Legislature the recommendations of the MPA Work Group on the use of MPAs as a marine resource management tool. In addition to the Washington State Legislature, this report is also directed to MPA managers in Washington and other states or territories, tribal governments, other federal, state, and local governments considering area-based marine resource management, as well as to interested organizations and members of the public.

Although representatives from several agencies, governments, and organizations participated in the MPA Work Group, this report is not a statement of policy issued from those organizations. In addition, this report is neither a comprehensive history of MPAs nor a compendium of the state of MPA science. The MPA inventory presented in Appendix 1 should be read only in the context of the accompanying narrative, explanation of methods, definition of terms, and list of exclusions.

Conservation Mandates and MPA Authorities in Washington State

Several federal and state natural resource agencies, tribes, and city and county governments are mandated to promote the conservation of marine resources within Washington. The targets of these mandates range from species, habitats, or geologic features like shorelines and estuaries to pollution prevention and protection of human health. Eleven agencies currently manage MPAs in Washington's state waters, including federal agencies, state agencies, and some local governments. See Appendix 1 for more information on conservation mandates and MPA authorities.

Treaty tribes have co-management authority over the treaty-reserved fishery resources within their usual and accustomed fishing grounds. Treaty tribes also have a management interest in the habitats required to sustain their treaty-reserved harvest. In cooperation with WDFW, tribes manage tribal harvest activities, and WDFW, in cooperation with tribes, manages non-tribal harvest. Tribal governments also have the authority to utilize MPAs as a management tool. In 2003, the Northwest Indian Fisheries Commission on behalf of its member tribes released a policy statement on MPAs, which is included in Appendix 2.

Finally, The Nature Conservancy, a nongovernmental organization, also owns and manages several MPAs in Washington in partnership with state regulatory agencies. Appendix 3 includes a summary of the management practices of each regulating agency including the agency's basis of authority, primary management objective, establishment procedure, partnering entities, adjacent land protection, and permanence or duration of protection.

History of MPAs in Washington

Starting in the late 20th Century, tribal fishermen and managers implemented area-based protections of marine resources in Washington well before the term *marine protected area* was coined and applied by federal and state agencies. Area-based protection strategies in the form of parks and refuges, as well as location-specific fishing gear restrictions, were utilized to conserve Washington's marine resources in the years proceeding and following statehood (1889). However, it wasn't until the early 1990s that MPAs gained significant attention as a promising management strategy in Washington. A brief history of MPA activity in Washington is included in Appendix 5. This history provides important context for the MPA Work Group's recommendations.

In 2008 the Puget Sound Partnership published their Puget Sound Action Agenda identifying "*protect intact ecosystem processes, structures, and functions"* as a priority action. A specific task identified under this priority is to *"implement a strategic network of Marine Managed Areas and Aquatic Reserves that contributes to conserving the biological diversity and ecosystem health in the marine areas of Puget Sound".* An associated near-term action is to:

> *Work with the Marine Managed Areas Work Group chaired by Washington State Department of Fish and Wildlife (DFW) to develop recommendations to improve the effectiveness of Marine Protected Areas (MPAs) by December 2009. Incorporate recommendations for MPAs in Puget Sound into the Action Agenda and take a lead role in implementation. In consultation with the*

tribes and other stakeholders, complete the management plans for the Cherry Point Aquatic Reserve and develop management plans for the following nominated reserves: Nisqually Estuary, Protection Island, and Smith Island in the Strait of Juan de Fuca. Implement recommendations. Coordinate the Cherry Point Management Plan with Whatcom County Cherry Point Management Area policies. Implement existing MPA plans in coordination with the Action Agenda. (Puget Sound Partnership 2008, p. 32-35)

In coordination with the MPA Work Group, the Puget Sound Partnership is currently developing a strategy to address ecosystem threats and achieve ecosystem targets, which might include MPAs.

At a national level, the National MPA Center completed an inventory of MPAs in 2007 including sites in Washington. The National MPA Center is currently developing a national system of MPAs in order to enhance protection and stewardship of marine resources, build partnerships and encourage coordination, and identify conservation gaps in current MPAs. In 2009, 18 Washington MPAs were included in the National System. The remaining MPAs identified in the Washington state inventory will be nominated for inclusion in the National System following the completion of this report.

MPA Work Group Methods

The MPA Work Group convened nine times to discuss the topic areas identified by the Legislature. The following provides a list of the schedule of meetings and topics covered:

December 16, 2008	Purpose of MPA Work Group, description of task and proposed timeline
February 3, 2009	Overview and planning, review draft MPA inventory
March 31, 2009	Examine current MPA management
May 1, 2009	Coordination, consistency, criteria
June 10, 2009	Terminology, management, and monitoring
July 7, 2009	Integration of science
August 4, 2009	Integration of local governments and NGOs
September 8, 2009	Review first report draft
October 13, 2009	Review second report draft

All MPA Work Group meetings were open to the public, and each meeting included opportunity for public and stakeholder input. Agendas and meeting summaries were circulated widely to a self-identified group of interested people, as well as to the Washington State Ocean Caucus listserv managed by Washington Department of Ecology. Meeting summaries are available by contacting Brie Van Cleve at brie.vancleve@dfw.wa.gov.

Other MPA Work Group activities included regular updates on the group's progress from the MPA Work Group Coordinator to the State Ocean Caucus and a briefing on the group's task and process provided by the Chair of the MPA Work Group to the Northwest Indian Fisheries Commission. Select MPA Work Group members also participated in a focus group convened by the Puget Sound Partnership to develop draft recommendations on networks of MPA for Puget Sound in the context of other ecosystem-based management tools for full MPA Work Group consideration.

At its first meeting, the MPA Work Group considered its charge from the Legislature and the definition of "MPA" provided by the Legislature. At early meetings, the MPA Work Group considered the broader policy context of MPAs including recent history relating to past MPA efforts in Washington, tribal perspectives on MPAs and the 2003 tribal policy statement on MPAs, Canadian MPAs in British Columbia, the MPA establishment process in Oregon, and federal MPA and other area-based marine management activities, such as marine spatial planning.

The MPA Work Group considered the work of the National MPA Center, their definition of key terms, and their effort to compile a national system of MPAs. MPA Work Group members agreed it was important to align terminology and the structure of Washington's inventory with the National MPA Center's as much as practical while still meeting Washington's unique information and data needs.

The MPA Work Group quickly identified the need to further define the terms used in the Legislature's definition of an MPA in order to make decisions about how to populate the inventory. WDFW staff sought advice from MPA managers, published literature, and National MPA Center staff on what and what not to include in the inventory. Table 2 compares the federal and state definitions of an MPA and key terms. Identifying where fisheries management and MPAs diverge proved especially challenging to ascertain. However, according to the Framework for the National System of MPAs for the U.S. (2008), area-based fishery management actions alone (i.e., gear type restrictions, closures for the purpose of quota management, or those not also including habitat or non-target species protections) do not qualify as MPAs.[3]

WDFW staff developed definitions of key terms (area, marine and estuarine, long term, designated, resources, protection) and revised these terms based on the MPA Work Group's feedback (Table 2). Once operational definitions were developed, WDFW staff populated the inventory with MPAs that qualified for the purposes of this report. Compilation of the inventory was informed by past MPA inventories including Broadhurst 2005, Murray and Ferguson 1998, Robinson 1999, National MPA Center 2009, Didier 1998, and National MPA Center 2008. Based on the MPA Work Group's suggestions, WDFW staff collected additional information relating to each MPA in order to summarize the most relevant attributes of each site including managing agency and owner/sponsor, size, year established, and protection level. The inventory was vetted widely by all managers of MPAs in Washington, as well as tribal governments, other natural resource agencies, NGOs, and other stakeholders. More details about the data collection strategy are presented in Appendix 1.

During the development of the inventory, the MPA Work Group explored several topics and discussed possible recommendations for the Legislature's consideration. On several occasions, members of the MPA Work Group were asked to present to the group information regarding the MPA activities of their respective agencies (namely, on the topics of monitoring practices, management practices, and integration of local governments and NGOs).

[3] Please see pages 19 and 20 of the Framework for the National System of MPAs in the U.S. for a definition of key terms within the federal MPA definition, specifically see the definition of "protection". In response to the WDFW staff question, MPA Center staff confirmed that "area-specific fisheries management actions along do not qualify by themselves as MPAs" (email communication with Lauren Wenzel, National MPA Center, Jan 23, 2009).

In accordance with the MPA Work Group's recommendations, the MPA Work Group Chair briefed the Northwest Indian Fisheries Commission (NWIFC) on the MPA Work Group's charge and activities. In support of this state-led effort, the tribes of the NWIFC agreed to revisit their 2003 policy statement on MPAs and consider whether this statement should be updated given recent activities. After consideration, the NWIFC agreed that the 2003 policy statement represents the current views of the member tribes (Appendix 2).

After consideration of all topics identified by the Legislature, the Work Group directed the compilation of recommendations and provided review of this report. The Work Group's process concludes with the delivery of this final report to the Legislature.

SUMMARY OF INVENTORY RESULTS

Washington is home to 127 MPAs managed by eleven federal, state, and local agencies. These sites occur in the Puget Sound and on the outer coast and cover approximately 644,000 acres and over six million feet of shoreline. Twenty-six percent of the state's marine waters and 27% of the state's shorelines are included in the boundaries of MPAs (Appendix 1).

The first MPA in the state was created in 1907. Although the number of MPAs has generally increased since then (Figure 1), the area of new MPAs spiked dramatically during two periods: from 1920-1929 when the University of Washington's San Juan County/Cypress Island Marine Biological Preserve was established, and 1990-1999 when NOAA's Olympic Coast National Marine Sanctuary was established. The area encompassed by these two MPAs—292,413 and 309,112 acres, respectively—is an order of magnitude larger than any other MPA in the state (Appendix 1, Table 4).

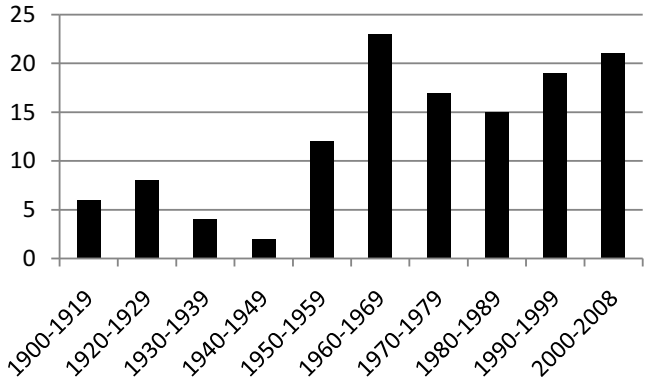

Figure 1. Number of MPAs Established by Year

The median size of MPAs is slightly over 23 acres (average size is 5,200 acres), although the size ranges from less than one acre to over 300,000 acres. There are wide differences in average size by managing agency; local agencies have the smallest MPAs, while federal and state agencies' MPAs tend to be intermediate in size, with the exception the two largest MPAs managed by NOAA (Olympic Coast National Marine Sanctuary) and the UW (the San Juan County/Cypress Island Marine Biological Preserve). State agencies have more MPAs than federal agencies, but by size (acreage and shoreline length) state and federal agencies manage near equal amounts (Appendix 1, Table 3).

The San Juan-Whatcom Action Area[4] holds the most MPAs (24) followed by Whidbey (19), Hood Canal (19) and Southern Puget Sound (19). The North Coast (5), Strait of Juan de Fuca (6), and North Central Puget Sound (7) have the fewest MPAs; however, the state's single largest MPA, Olympic Coast National Marine Sanctuary (OCNMS), spans nearly all (94%) of the North Coast area. The San Juan-Whatcom Action Area's numerous MPAs provide some protections to 57% of the waters within that area. These statistics may give the impression that restrictive MPAs cover a large percentage of state waters. However, without Olympic Coast National Marine Sanctuary and the San-Juan-Whatcom Action Area MPAs (Figures 2 and 3), only 1-5% of the Puget Sound and coastal region would be covered by some form of MPA (Appendix 1, Table 6). Moreover, the largest MPA in Washington, OCNMS, does not restrict harvest activities, vessel anchoring or recreational access. Puget Sound and coastal areas are shown in Appendix 1, Figures 1 and 2.

Almost all (97%) of the MPAs restrict fishing and shellfish harvest to some degree. These MPAs cover 626,333 acres. Sixteen percent of MPAs prohibit all harvest of resources under the authority of the managing agency. Three-quarters (77%) of MPAs restrict non-harvest activities to some degree such as vessel anchoring or recreational access (Appendix 1, Table 7).

[4] Engrossed Substitute Senate Bill 5372 (2007) created the Puget Sound Partnership and established seven geographic action areas around the Puget Sound to address problems specific to those areas. The seven action areas are: Hood Canal, North Central Puget Sound, San Juan/Whatcom, South Central Puget Sound, South Puget Sound, Strait of Juan de Fuca, and Whidbey.

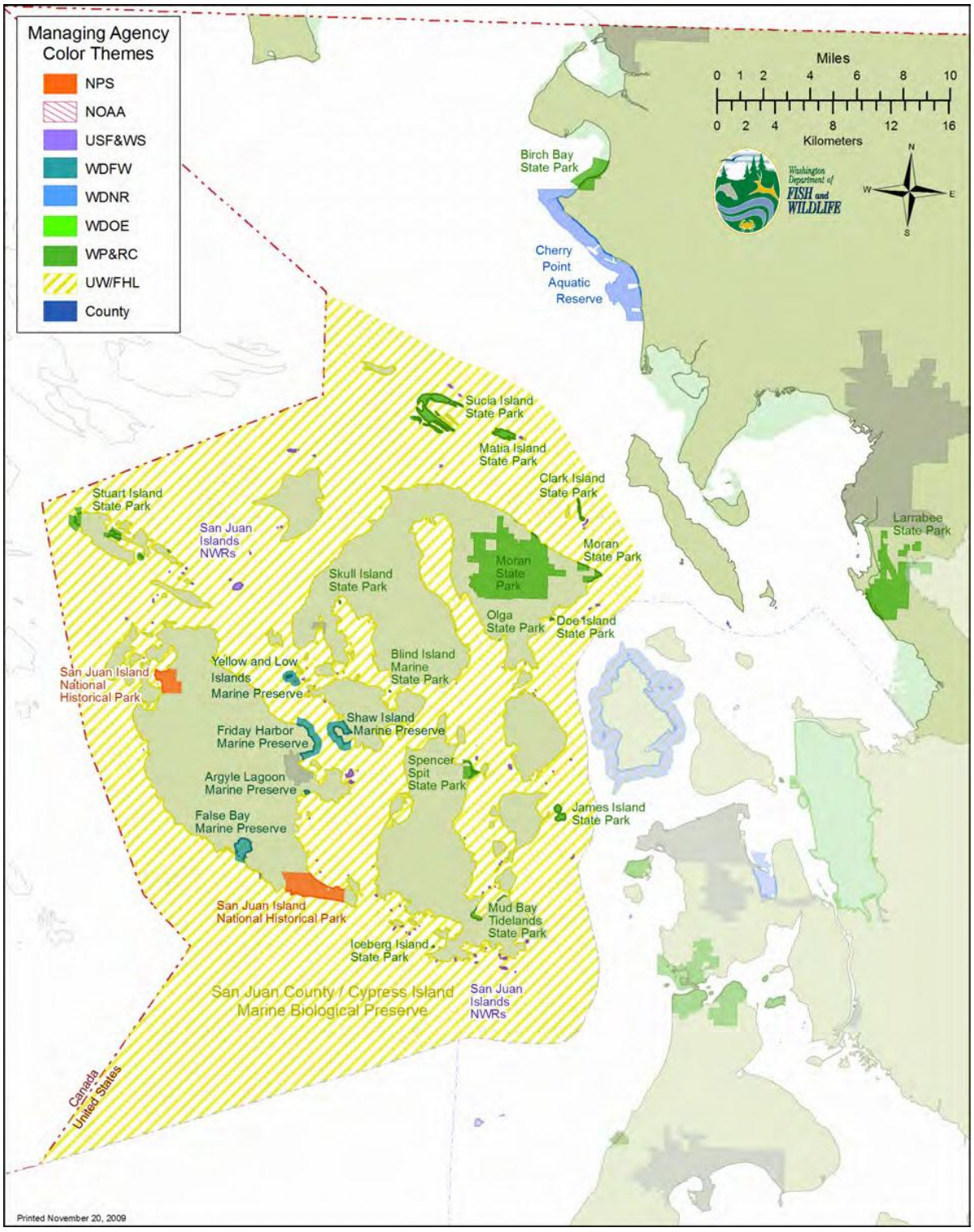

Figure 2. MPAs by managing agency in the San Juan – Whatcom Action Area. Please note that Matia Island is a U.S. Fish and Wildlife Service National Wildlife Refuge. However, Matia Island State Park is operated by and attributed on this map to Washington State Parks and Recreation Commission.

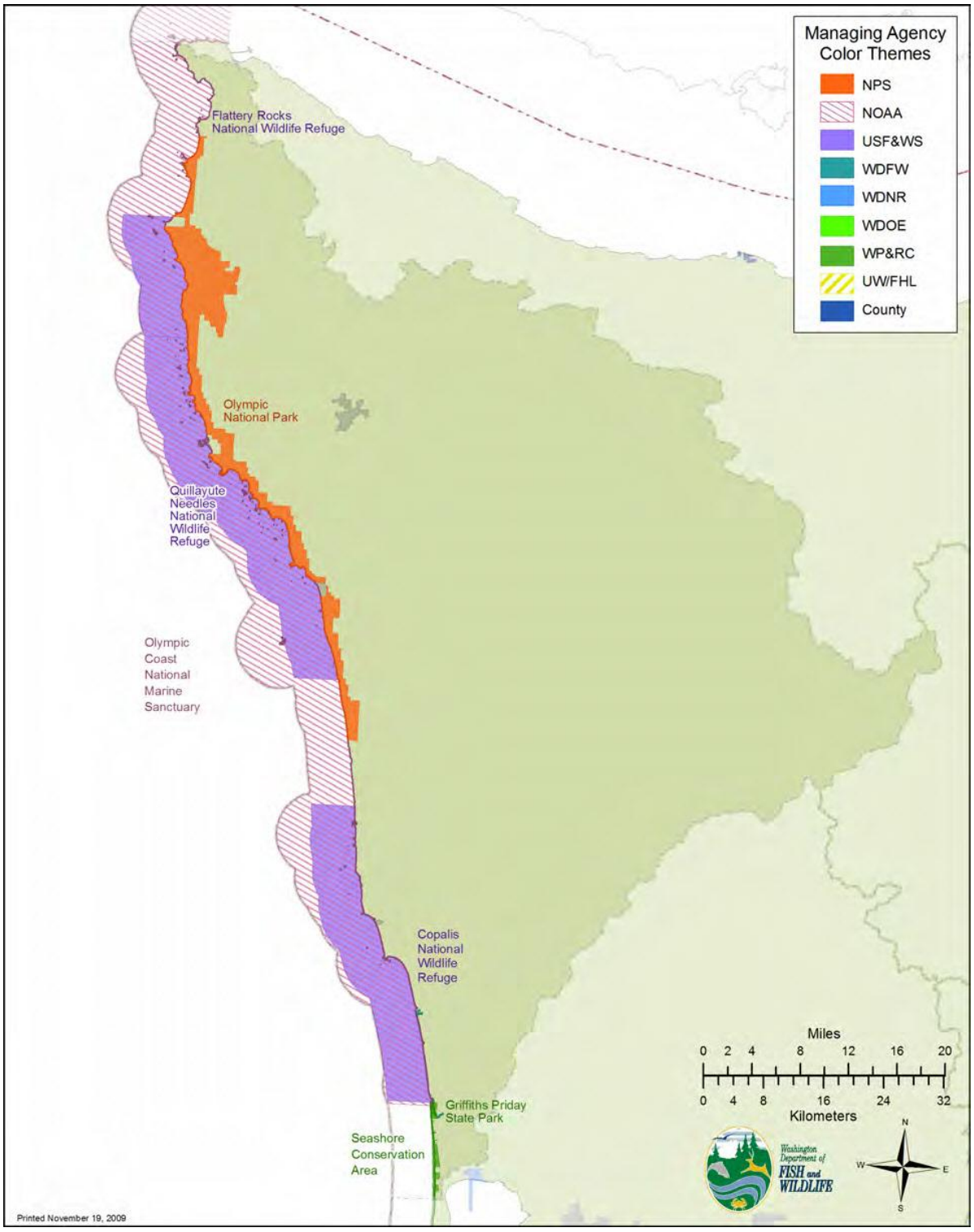

Figure 3. MPAs by managing agency in the North Coast area.

ASSESSMENT OF FINDINGS

During the development and review of the inventory, the MPA Work Group discussed extensively the correct interpretation of the inventory results and the potential for misinterpretation. Grober-Dunsmore et al. (2008) observed that scientists and policy-makers are shifting their focus on MPAs to include consideration of appropriate levels of protection in addition to physical design and siting issues. Consistent with this observation, the MPA Work Group was most concerned that providing an inventory of marine "protected" areas would provide the false impression that all marine resources within those areas were adequately and effectively "protected." This concern lead the Work Group to discuss how to accurately summarize the effectiveness of protective management measures, as well as the degree of protection afforded by existing MPAs to specific species or habitats from the standpoint of sustainable, ecosystem-based management.

The MPA Work Group struggled to find universally applicable categories, or levels, of protection that were ecologically meaningful and more informative than "no-take/no-access" (highest level of protection) and "some take/some access" (intermediate level of protection) as all 127 MPAs identified would be classified unhelpfully in the latter category. Assigning numerical protection—or even qualitative—levels to sites that are less protective than no take/no access is problematic because it requires an in depth understanding of current management schemes and effectiveness. The group agreed that in order to delineate meaningful degrees of protection, each MPA would need to be evaluated using the agency's primary management objective for establishing it or—even better—MPAs would be evaluated on their potential to contribute to a coordinated marine conservation approach.[5] The latter scenario, however, would require either substantial marine science or value judgments beyond the scope of the MPA Work Group's charge. For example, one would have to decide if an MPA that completely protected benthic habitat from disturbance caused by intertidal construction activities was more or less "protective" than an MPA that limited fishing of several species of fish, but provided no habitat protection. The MPA Work Group agreed that the *levels of protection* defined by the National MPA Center were, although imperfect and somewhat inadequate, sufficient for the completion of the inventory. Protection levels are described in *A Functional Classification System for Marine Protected Areas in the United States* (National MPA Center 2006).

The Work Group noted that inclusion in the inventory was not indicative that an area provided a higher level of actual marine resource protection than areas not included. And vice versa, some areas may provide some marine conservation benefit while not meeting the definition of an MPA. For example, military closures are not included in the inventory because they are established for purposes other than marine conservation. However, by prohibiting certain activities like fishing within their borders, military closures provide protection to the marine resources within and act as de facto MPAs.

[5] The Nature Conservancy is undertaking a gap analysis to categorize marine protected areas by level of protection in Washington state and federal waters. The report will be completed no later than December 31, 2009. Questions about this project may be directed to Jacques White at jwhite@tnc.org.

In addition, some MPAs may only provide theoretical protection ("paper parks" on land). For example, some state parks may actually concentrate certain activities within the MPA and provide less protection to marine resources than if the area were never designated.

Finally, the group discussed at length the role of MPAs in the context of ecosystem-based management. The group agreed that networks of MPAs are a potentially valuable tool to achieve ecosystem-based management, but that not all MPAs included in the inventory can be considered examples of ecosystem-based management. The group concluded that MPAs sited and designed in isolation rarely achieve ecosystem-based management principles, while MPAs planned to interact (i.e. a "network") and complement other management approaches can be very valuable.

The group discussed marine spatial planning, for which there is strengthening national interest, as another tool to achieve ecosystem-based management. Marine spatial planning generally consists of two steps: (1) compilation and analysis of spatial data about marine habitats, species, and resource uses, and (2) a multi-stakeholder planning process to identify areas of the ocean for specific types of uses. In a comprehensive planning process, areas for marine conservation, or MPAs, could be recommended and established. The group agreed that principles and practices associated with science based MPA establishment criteria and management could be applied during marine spatial planning efforts.

The MPA Work Group also reflected on past efforts to promote a network of MPAs in Washington. In 1995, a multi-agency group called the Washington MPA Work Group began work to develop a strategy to design and implement a network of MPAs. This group intended this strategy to lead to a distinctly different approach to establishing MPAs by departing from the historically uncoordinated, piecemeal approach. This group acknowledged value in undertaking the task of developing a strategy rather than establishing MPAs as expeditiously as possible. The draft strategy produced in 1998, but never finalized, called for the development of a draft policy for MPAs in Washington; evaluation of sites by a policy and technical committee; strong tribal, local government, and public involvement; use of the precautionary approach; evaluation of outcomes at individual sites; and adaptive management (Mills 1998). The current Work Group agreed effective use of MPAs as a management tool would be greatly improved by a coordinated strategy to guide the establishment of an ecologically meaningful network of MPAs and considered recommendations to support the development of such a strategy.

I. Coordination and Consistency

Murray and Ferguson (1998) noted that a variety of MPAs had been created in Puget Sound without an overarching policy, design, or coordination mechanism among managing agencies. Their results document uncoordinated MPA objectives, site selection criteria, design, financing, designation, management, and monitoring and evaluation. The Work Group's findings a decade later largely agree with Murray and Ferguson's documented need for coordination and consistency among MPAs and MPA managers.

The MPA Work Group discussed at length the benefits of networks of MPAs. The group noted that protection of relatively large areas or numerous smaller areas may be required to ensure that larvae

are available to replenish and sustain populations within MPAs. However, economic, social and political constraints often make it unfeasible to create one large MPA of sufficient size to support viable, self-sustaining populations of all species. Small and isolated MPAs may not support self-sustaining fish and invertebrate populations. Therefore, establishing networks of many small to moderately sized MPAs can help to reduce socioeconomic impacts without compromising conservation and fisheries benefits provided by MPAs (PISCO 2007). In addition, ecologically functional networks provide spatial linkages needed to maintain ecosystem processes and connectivity and improve resilience by reducing risk in the case of localized disasters, climate change, failures in management or other hazards. Thus a network of MPAs can help to ensure the long-term sustainability of populations better than single sites can (NRC 2000).

Given the numerous agencies and entities with authority to establish new MPAs, it is unlikely that one authority alone could establish an ecologically functional network of MPAs. Therefore, the first step to realizing the potential benefits of ecosystem-based management through a network of MPAs is agency coordination on objectives, establishment criteria, terminology, and management and monitoring practices. In the San Juan Archipelago, MPA managers have convened annually since 2004 to share management strategies, consider MPA objectives in a larger context, and learn how to improve the management of their sites. This coordination effort, initiated by the Northwest Straits Commission, has proven to be valuable in the San Juan Islands and could be applied in other regions of the Puget Sound or coast (Broadhurst 2005).

Anticipating a strong likelihood that new MPAs will be proposed in the future, either independently or as part of large-scale marine spatial planning efforts, the group identified the need for a Puget Sound and coast-wide coordinating entity to oversee the implementation of the recommendations in this report, review new MPA proposals, convene MPA managers, and lead coordination efforts. Members of the MPA Work Group determined that its structure and charge were effective and useful. The group proposed some continuance of an MPA Work Group to resolve and review MPA-related issues as they arise.

A. GOALS

Consistent, or at the very least complementary, MPA goals and management objectives are essential for using MPAs in a coordinated approach for ecosystem-based management and recovery purposes. The MPA Work Group noted the state lacks a unified overarching conservation goal, but that each natural resource agency has a conservation component as part of its respective mandate. The Puget Sound Partnership has defined a series of nested conservation goals for Puget Sound (Puget Sound Partnership 2008).

The National Research Council outlined the first step in MPA design to be the determination of local and regional conservation needs depending on the types of resources, the intensity and nature of human uses, and the physical and biological characteristics of the habitats, followed by establishment of specific management goals and priority objectives informed by conservation needs (NRC 2001). MPA Work Group members agreed on the need to identify conservation concerns as a first step in

determining an appropriate management response. This approach also is clearly articulated in the 2003 MPA policy statement of the treaty tribes of the Northwest Indian Fisheries Commission (Appendix 2).

The group did not consistently find clear goal statements and measurable objectives among the MPAs inventoried, but identified this element as critical for measuring success of MPAs and making their utilization more effective.

B. Establishment Criteria

The MPA Work Group agreed that criteria for MPA site selection should be determined relative to clearly stated objectives. DNR's Aquatic Reserve program provides an example of predetermined criteria for MPA establishment for the three different kinds of Aquatic Reserves. Criteria should include biogeographical, ecological and social considerations (e.g. habitat rarity, regional representative, high species diversity, accessibility to users, manageability), and when properly defined, these criteria can be used to determine the need for individual MPAs or a network of MPAs. In the absence of a complete set of criteria to inform network design, available biological criteria can be used to inform initial network design (Palsson 2002).

C. Management Practices

Based on presentations by MPA managing agency representatives (summarized in Appendix 3), the MPA Work Group found that conservation of one or more species was a common primary management objective, and all agencies except WDFW reported protection of habitat as a primary objective. Olympic National Park (ONP), State Parks, and WDFW reported provision of recreational opportunities as a primary objective, and all agencies except ONP and State Parks cited education and research as primary objectives. MPA managers reported that many, but not all MPAs are bordered by adjacent terrestrial protection. Managers also cultivate numerous partnerships that help leverage limited resources to improve site management. Partners include other agencies, tribes, local governments, nongovernmental organizations, recreational users, businesses, academic institutions, property owners, volunteers, and visitors.

Representatives for ONP, State Parks, and UW reported relatively robust enforcement coverage at sites, while WDFW and the Olympic Coast National Marine Sanctuary (OCNMS) reported partial coverage, and USFWS and DNR reported little formal on-site enforcement. While only ONP, USFWS, WDFW, and State Parks employ enforcement agents, other site managers often rely on these enforcement agents to implement rules at other sites as well. In addition to enforcement officers, site managers use volunteer caretakers, on-site managers, and peer pressure to enforce site rules. When site managers ranked enforcement presence at their sites, responses ranged through the entire scale (1 to 5).

MPA managers reported duration of protection as 'permanent' at their sites with periodic review, with the exception of DNR's aquatic reserves which are established for 90 years. On a scale of 1 to 5 with 1 representing little to no management success and 5 representing measurable outcomes with positive

results, MPA managers rated the level of management success at their sites between 3 and 5. Finally, MPA mangers cited several suggestions for improving management including the implementation of new MPAs, periodic program evaluation and management plan review, improved cooperation and collaboration with other agencies and entities regarding research and management tools, increased public outreach, improved or expanded management authority, additional patrols and enforcement personnel, improved design and placement of MPAs, additional program implementation and monitoring funding, and development of a comprehensive conservation strategy (Appendix 3).

D. TERMINOLOGY

The MPA Work Group noted that the following terms are used to describe MPAs included in the inventory: aquatic reserve, refuge, marine preserve, conservation area, park, research reserve, recreation area, sanctuary. Some terms adequately describe the primary management objective of the MPA, such as "recreation area", while others, such as "sanctuary", do not adequately convey the multitude of management objectives. Further, some terms falsely suggest more protection than others (e.g. WDFW's "marine preserves" are counterintuitively less protective than WDFW's "conservation areas"). The group agreed that the current terminology used to describe various types of MPAs complicates and even frustrates efforts to improve coordination and consistency among MPAs and MPA managers. Lack of consistent terms and use of counterintuitive terms may convey misinformation to the public and stakeholder groups if terminology promotes incorrect assumptions regarding protection levels.

E. MONITORING PRACTICES

Successful MPA planning and implementation depends on measurable scientific objectives, criteria to gauge success, and monitoring program to collect information to be used in evaluation (Palsson 2002). The group noted that gauging the success of MPAs as a management strategy is dependent on monitoring how well MPAs achieve their management goals and objectives; however, the majority of current monitoring activities track and report marine resource status and not MPA effectiveness. Only WDFW and to some extent DNR and OCNMS conduct some MPA effectiveness monitoring. MPA managers identified several impediments to implementing effective monitoring including large areas of the environment to cover, expense of ship and aircraft time for survey work, insufficient staff funding for data management and analysis, the challenge of avoiding harm to species or habitats while conducting research, narrow agency mandates, and, in some cases, a lack of agency expertise (Appendix 4).

The group agreed that monitoring should focus on MPA effectiveness with before-after-control-impact studies in the context of the entire ecological system including monitoring of baseline conditions. Because monitoring effort and focus varied between state and federal agencies, the group noted that recommendations should be tailored to these levels of government and also dependant on the management purpose of the MPA.

II. Improved Integration

A. Science

The Work Group noted diverse approaches to integrating science and involving scientists in MPA establishment and management decisions. The degree to which decisions are made based on scientific information or involving appropriate scientific expertise ranged substantially between the management agencies studied. When available, monitoring data seemed to be important for supporting decision-making; however, the Work Group found a general lack of investment in monitoring programs among MPAs, with few exceptions. The Work Group also noted and agreed on the value provided by research in MPAs.

Based on a series of interviews with MPA managers from around the country, Bernstein et al. (2004) concluded that superficial assurances of a "science-driven process" should be replaced with specific roles that scientists will play and clear articulation of how science will be used to make decisions. Bernstein et al. also cautioned against separating scientists and stakeholders in the process or on specific tasks, for example, employing scientists and stakeholders at different stages of the process or delegating tasks such as map-making to scientists without stakeholder involvement. The Work Group agreed that consistent expectations about the role of science and scientists in MPA-related decisions would likely increase the use of science overall.

Work Group members found that the inventory could be a useful source of information to support assessment of MPA performance against primary management objectives in the context of overarching marine conservation goals. Once performance of the current suite of MPAs was assessed, the inventory and additional supporting information could be used to assess gaps in the current marine resource conservation landscape (see also III.B Improving Effectiveness with Performance Evaluation).

B. Local Governments and Nongovernmental Organizations

The MPA Work Group found that Marine Stewardship Areas (MSAs) offer both non-regulatory and regulatory tools to involve local government, nongovernmental organizations and local communities in creating a framework for ecosystem-based management that can add value to individual MPAs within their borders. An organization that is committed to working with the community to develop and carry out the stewardship mission and goals is an essential part of this management approach.

The San Juan MSA was established to protect marine habitats and species as well as for sustainable socio-economic uses such as thriving livelihoods and enjoyment and preservation of cultural traditions. San Juan County designated the entire county as a Marine Stewardship Area in 2004 and in 2007 adopted a resolution to use the management plan to guide its operations and policies. The MSA plan was developed by the San Juan Marine Resources Committee (MRC) and several partners using a conservation planning method developed by The Nature Conservancy. The Work Group noted that the San Juan MSA has provided a focus for monitoring and research, outreach, and policy recommendations. Additionally, the MSA has improved coordination among MPAs by linking these protections with broader, ecosystem-based protection efforts afforded through educating and

engaging citizens, recognizing community resources and values and bringing together local and regional marine managers who have regulatory and non-regulatory management responsibilities within the region. A Marine Stewardship Area is being considered for the Port Susan Bay area by the Stillaguamish and Tulalip Tribes, MRCs, and other partners. The Work Group found that the establishment of an MSA with its breadth of conservation and socio-cultural goals, partnerships, and coordination offers the potential for an innovative adaptive management model that could benefit MPAs.

III. Improving Effectiveness

A. MPA Networks

The Work Group agreed that effective use of MPAs as a management tool would be greatly improved by a coordinated strategy to guide the establishment of an ecologically meaningful network of MPAs. Based on this need, the MPA Work Group tasked a focus group to develop recommendations for developing a network of MPAs in Puget Sound, comparing MPAs with other management tools, and incorporating MPAs into broader planning processes and integrated ecosystem assessment efforts including marine spatial planning. The focus group identified a strong need for coordination with and inclusion of tribes in considering any new MPAs as part of a network. The group concluded that network development and implementation should be guided by the transparent and systematic assessment framework presented in the tribal policy statement on MPAs (Appendix 2).

B. Performance Evaluation

The MPA Work Group identified a need to evaluate the performance of existing MPAs in order to determine whether or not existing MPA authorities provided adequate ecosystem protection and also to determine whether or not agencies are implementing existing authorities effectively and managing MPAs efficiently. Because the MPA Work Group determined that information needed to support this evaluation was unavailable, evaluation of MPA performance was highlighted as a recommendation. The group acknowledges that work currently being conducted by The Nature Conservancy will support this evaluation.

RECOMMENDATIONS

Based on the findings presented above, the MPA Work Group developed several recommendations to improve the use of MPAs as a management tool. These recommendations are listed in Appendix 6. As directed by the Legislature, the recommendations of the MPA Work Group address: (a) coordination and consistency regarding goals, criteria for establishment, management practices, terminology, and monitoring practices; (b) integration of science, local governments, and NGOs into establishment and management decisions; and, (c) improvements to MPA effectiveness in Washington. The recommendations are thus presented using the following organization:

I. IMPROVING COORDINATION AND CONSISTENCY
   A. goals
   B. establishment criteria
   C. management practices
   D. terminology
   E. monitoring practices
II. IMPROVING INTEGRATION
   A. science
   B. local governments and NGOs
III. IMPROVING EFFECTIVENESS

I. COORDINATION AND CONSISTENCY

1. Promote coordination between tribes, state and federal agencies, and local jurisdictions in Puget Sound and on the coast relative to existing MPAs and future MPA planning efforts with dedicated support for coordination.

The MPA Work Group does not need to be formalized, but should persist as an informal group beyond the completion of this report as a forum to discuss MPA policy and management issues across varying jurisdictional boundaries. Possible tasks of the Work Group are identified in recommendations below. Federal agencies, tribes, and local governments would be invited to participate on the Work Group, and encouraged to utilize complementary MPA authorities when warranted by a conservation concern. The Puget Sound Partnership would also be an invited participant as they would be the lead agency relative to implementation of these recommendations as they apply to Puget Sound. The MPA Work Group recognizes that continued participation in work group meetings is a workload concern and some participants may not be able to regularly engage in discussions due to budget and staffing constraints.

It is anticipated that the individual managing agencies would continue to work through their separate processes, including stakeholder involvement and public outreach, as they utilize their independent authorities to consider and create MPAs. The purpose of the informal MPA Work Group would be to inform the different entities relative to MPA activities and facilitate coordination.

The MPA Work Group should be staffed by a dedicated FTE to coordinate agency MPA actions and convene meetings between MPA managers similar to the coordination role provided by Washington Department of Ecology for the Washington State Ocean Caucus.

A. GOALS

2. MPAs should address a documented conservation concern through clear goals and objectives and performance evaluation.

Managing agencies – coordinated through the MPA Work Group – should clearly articulate conservation needs and the ultimate conservation goals of MPAs. Primary management objectives should be established, and the success of the management approach should be monitored, evaluated, and redirected if performance is inadequate. Upon achievement of the conservation goals, the need for the MPA should be reevaluated. An MPA not achieving the management objectives should be eliminated and or replaced. For future Puget Sound MPAs, managing agencies should work with the Puget Sound Partnership to agree on goals and objectives that align with the goal to recover the health of the Puget Sound by 2020. Tribes and agencies should work together to identify marine ecosystem conservation concerns and develop consistent area-based management where feasible and beneficial.

B. ESTABLISHMENT CRITERIA

3. Agencies should link their respective processes for consideration of new MPAs and should use one or more existing MPA authorities to address conservation needs.

State agencies should maintain autonomous authority to establish and manage MPAs, but should collectively create and follow formal coordination procedures to strategically implement necessary protections at each site using multiple authorities as needed (e.g. mechanism to trigger DNR site review during WDFW MPA establishment process; for example, the Saltwater State Park establishment process). When considering MPA establishment and the effectiveness of new MPAs, agency process should trigger consideration of the scientific data supporting the management action by other agencies with MPA authorities. Specifically, Washington departments of Natural Resources and Fish and Wildlife should link their MPA establishment processes for consideration of more comprehensive ecosystem coverage. Consideration and maintenance of tribal treaty rights should be a priority when MPAs are proposed. When analyzing conservation needs and MPA performance, MPA managers should consider management and ecological regimes that might affect the utility or effectiveness of MPAs as a management tool (e.g. climate change, tribal and non-tribal fishing activities, land use and development, etc.).

4. Coordinated by the MPA Work Group, MPA managing agencies should develop common criteria and a process for evaluating MPAs.

Criteria should include consideration of conflicting uses, stakeholder views, and the process should explicitly engage stakeholders in the evaluation process.

C. Management Practices

5. Provide adequate funding for MPA designation, management, and monitoring.

The Work Group viewed the current level of funding to state agencies with the authority to create MPAs as inadequate to support existing programs. Additional funding for these agencies is needed to maintain existing programs as well as to accomplish these recommendations.

D. Terminology

6. Promote consistent use of MPA-related terms among state MPAs and between state and federal MPAs where possible. Where necessary, change state laws and regulations to reflect a consistent set of terms across multiple agencies.

Terminology describing different kinds of MPAs (i.e. marine reserve, conservation area, underwater park, etc.) should reflect the primary management objective, uses or impacts allowed within the MPA, or the level of protection provided by the MPA. Terminology should also be consistent with federal MPA agencies and state MPA agencies, where possible, in order to avoid confusion or misunderstanding when discussing different types of MPAs or MPAs managed by different agencies.

E. Monitoring Practices

7. Inventory and evaluate current monitoring activities and identify overlaps and critical gaps in monitoring activities. Key monitoring activities should address a range of necessary management targets, including socioeconomic targets, where appropriate.

The MPA Work Group should foster partnerships and coordination between various entities to identify and fill gaps in monitoring needs.

8. Promote consistent management and sharing of monitoring data and maximize benefits of monitoring efforts by leveraging funding through formal agency partnerships.

Monitoring goals and objectives from multiple agencies should be integrated. Where multiple agencies have jurisdiction or co-management authority, the interests of all groups should be integrated into monitoring plans. A consistent data management and sharing system of monitoring efforts and outcomes could be developed and utilized by MPA managing agencies. This should include baseline data. Use of centralized databases would facilitate data availability and sharing of research results and metadata from Washington and other states. MPA managing agencies should use an existing monitoring forum (e.g. Washington Monitoring Forum or the Monitoring Consortium) to coordinate MPA monitoring activities. Interagency coordination through formal agreements could improve funding success and leverage monitoring efforts. Partnerships with academic programs could be used to support data analysis. Monitoring results should be incorporated into outreach materials and activities for distribution to the public in an understandable format. The Puget Sound Partnership's outreach program could be used as an outlet for these materials.

9. Target monitoring towards identified management goals, objectives, and threats in an ecosystem context and, where possible, coordinate monitoring of common threats across MPAs.

To improve monitoring of MPA effectiveness and efficiency, risks and threats to natural resources should be identified, consequences of inaction made clear, and resources must be provided to support monitoring and follow-up actions supported by monitoring results. Thus monitoring efforts should have clearly defined measurements that will address goals, objectives, management issues and threats.

II. IMPROVED INTEGRATION

A. SCIENCE

10. Conduct a Puget Sound and coast-wide marine conservation needs assessment and gap analysis of existing MPAs and provide recommendations for action.

Conduct a system-wide needs assessment to determine marine conservation targets and a gap analysis of the current set of MPAs relative to identified needs. This gap analysis should be the basis of further performance evaluations to improve the use of MPAs as a conservation tool. These evaluations should be conducted on the entire current suite of MPAs and should include analysis of the current suite as a system-wide conservation tool (potential MPA network). The Nature Conservancy (TNC) is currently building on the work of the MPA Work Group by conducting an analysis to determine how much marine area is protected and at what level of protection. The results of this analysis are expected soon after publication of this report and are therefore not included. The MPA Work Group acknowledges that this work will likely address this recommendation in part, although remaining tasks include a marine conservation needs assessment, an analysis of current protection by ecological function, and evaluation of actual protection afforded these protected marine areas. The MPA Work Group should continue to monitor and review ecological gap analyses including the National MPA Center's pilot gap analysis in California and TNC's ecological gap analysis of Washington MPAs. The MPA Work Group should review these analyses and provide recommendations for conducting additional needed assessments and filling identified conservation gaps.

11. Use other ecosystem-based management tools to inform MPA management and establishment.

In addition to informing MPA science with broader monitoring data, assessment tools such as Integrated Ecosystem Assessment and other spatial datasets should be incorporated into MPA management and establishment decisions.

B. Local Governments and Nongovernmental Organizations

12. Consider using Marine Stewardship Areas to engage local governments and NGOs in developing MPA proposals.

The San Juan MSA has proven effective at energizing and organizing the community, securing visitors bureau, businesses, and county buy-in to the plan, promoting a holistic approach to ecosystem based management, and coordinating existing MPAs within its borders into a network. MSAs should be used as a mechanism to improve coordination and consistency of management of existing MPAs within its borders. MSAs could be proposed by a variety of entities including local government entities, state agencies, non-profits, or other stakeholders. The Work Group considered the Port Susan MSA proposal led by the Tulalip Tribe is a good example of an effective establishment process to follow.

III. Improving Effectiveness

13. Use the tribal MPA policy developed by the tribes of the Northwest Indian Fisheries Commission in 2003 as a starting point from which to evaluate the effectiveness of MPAs.

At a minimum, the following entities would be invited to participate in this Puget Sound Partnership-sponsored process: affected tribes; state government agencies that manage MPAs; local governments (e.g., counties, marine resource committees); and stakeholders, including nongovernmental organizations, and affected marine-based industries (e.g. fishing and aquaculture industries).

A. MPA Networks in Puget Sound

14. Implement a comprehensive process to evaluate the effectiveness of existing MPAs using the tribal MPA policy statement to determine what would be required to create networks of MPAs.

The group recommended evaluating the existing suite of MPAs for potential development into a network of MPAs. For Puget Sound, the evaluation process should incorporate the following steps: [6]

a. review the goals and objectives of existing Puget Sound MPAs with a conservation focus as described in the inventory developed by the MPA Work Group;
b. assess the degree to which conservation objectives may be supported by MPAs set up with different goals in mind. For example, state parks regulate certain activities to achieve recreational benefits, but there may be a conservation benefit realized as well.
c. review the threats targeted by those MPAs (i.e., why were they established? what is the expected outcome?);
d. evaluate whether the current management measures associated with MPAs are effective at addressing those threats and/or accomplishing those goals and objectives;
e. assess whether additional or different management measures could address those threats or accomplish those same goals and/or strengthen the ability to achieve them;

[6] The framework described in items a-h was developed for application to the Puget Sound, but a similar process could be applied on the coast.

f. discuss whether other management tools should be used in addition to or in place of MPAs;
g. develop recommendations for changes to management measures for existing MPAs, if appropriate; and
h. discuss how to determine where additional MPAs are needed to build or strengthen different MPA networks.

B. Performance Evaluation

15. Use adaptive management to optimize efficiency and effectiveness of individual MPAs and MPA networks.

Baseline and monitoring data should be used in adaptive management. Accurate information and monitoring results are critical for implementing adaptive management and evaluating MPA effectiveness (see additional recommendation relating to monitoring under section I.E.).

16. Identify and monitor reference sites in order to evaluate MPA effectiveness.

Reference sites should be identified by MPA managing agencies or by Puget Sound Partnership and monitored in order to support assessment of MPA effectiveness.

17. Promote consistent area-based marine conservation through alternatives to MPAs.

Future MPA work groups or entities should consider ways to promote consistent and effective management and resource protection in "MPAs" not included in the current inventory, such as private or voluntary MPAs or area-based fishery management.

Conclusions

The MPA Work Group acknowledges significant challenges to using MPAs to achieve management goals including lingering uncertainty regarding the effectiveness of MPAs relative to other management tools, potential for real or perceived conflicts with tribal treaty rights, and opposition among some user groups to regulating various types of human use in marine areas. Although these challenges are significant, the MPA Work Group affirms that challenges can be overcome with sound science; carefully coordinated joint management; and use of transparent processes featuring well-articulated and coordinated management objectives and expected outcomes. The MPA Work Group acknowledges that area-based marine resource management and protection in the form of MPAs can promote ecosystem resilience in the face of changing ocean and coastal conditions and protect against uncertainties inherent in fisheries management. Finally, the group notes that comprehensive marine planning could provide an appropriate context for the consideration of MPAs. Best practices and lessons-learned about establishment and management of MPAs should be applied in any marine spatial planning efforts that seek to expand or network areas of marine protection.

Table 2. Comparison of Federal and State MPA Terminology and Definitions		
	National MPA Center definitions and key terms	**Washington state definitions and key terms**
Marine protected area	A marine protected area is "any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." (Executive Order 13158)	A marine protected areas is "a geographical marine or estuarine area designated by a state, federal, tribal, or local government in order to provide long-term protection for part or all of the resources within that area." (SSB 6231, 6/12/08)
Marine managed area	MMAs differ from MPAs primarily in the duration of the site's protection. MMAs must provide yearly protection for at least three months out of each year, and must provide a minimum of two years protection. MPAs must be designated with the intention to become permanent.	MMAs encompass a wide variety of area-based marine management including fisheries closures, temporary protections, and all MPAs as defined above. MMA is a more inclusive term than MPA.
Marine reserve	A type of MPA where extractive uses are prohibited (also referred to as "no-take" reserve).	No consistent definition.
Boundary area	"Area" must have legally defined geographical boundaries, and may be of any size, except that the site must be a subset of the United States federal, state, local, or tribal marine environment in which it is located. Application of this criterion would exclude, for example, generic broad-based resource management authorities without specific locations and areas whose boundaries change over time based on species presence. The area must be one over which the United States has jurisdiction, consistent with international law.	"Area" must have legally defined geographical boundaries and may be of any size. The Department of Fish and Wildlife has classified several types of marine habitat as "areas of special concern" in which construction activities may be restricted to protect marine resources (WAC 220-110-250). These areas include forage fish spawning grounds, rockfish and lingcod nursery areas, juvenile salmonid migration corridors and feeding areas, as well as eelgrass and kelp beds. These areas do not have specific geographical boundaries and are, therefore, excluded.

Marine enviro-nment	"Marine environment" must be: (a) ocean or coastal waters (note: coastal waters may include intertidal areas, bays or estuaries); (b) an area of the Great Lakes or their connecting waters; (c) an area of submerged lands under ocean or coastal waters or the Great Lakes or their connecting waters; or (d) a combination of the above. The term ''intertidal'' is understood to mean the shore zone between the mean low water and mean high water marks. An MPA may be a marine component part of a larger site that includes uplands; however, the terrestrial portion is not considered an MPA. For mapping purposes, an MPA may show an associated terrestrial protected area. For purposes of the national system, NOAA and DOI intend to use the following definition for the term ''estuary'': ''part of a river or stream or other body of water having unimpaired connection with the open sea, where the sea water is measurably diluted with fresh water derived from land drainage, and extending upstream to where ocean-derived salts measure less than 0.5 parts per thousand during the period of average annual low flow.'' Application of this criterion would exclude, for example, strictly freshwater sites outside the Great Lakes region that contain marine species at certain seasons or life history stages unless that site is a component of a larger, multi-unit MPA. Upon request, the agencies will work with individual federal, state, and tribal MPAs and programs to examine unique conditions that may affect applicability of the term ''estuary'' or "coastal waters" for sites that have national or regional significance or representativeness. Estuarine-like sites on tributaries of the Great Lakes will be considered for inclusion if they are located within the eight-digit U.S. Geological Survey cataloging unit adjacent to a Great Lake or its connecting waters.	"Marine and estuarine" means territorial waters of the Pacific Ocean and Puget Sound including the intertidal zone up to the high tide line. An MPA may have a terrestrial component as well, but that portion was not considered part of the MPA for this inventory. Areas beyond state waters were excluded. Where a MPA spans state and federal waters, only the portion in state waters was included in this inventory.
Duration	"Lasting" means that for natural heritage and cultural heritage MPAs, the site's authority must clearly state its intent to provide permanent protection. This definition recognizes that subsequent to establishment, MPA designation and level of protection may change for various reasons, including natural disasters that may destroy or alter resources or changes in societal values. Should any of these	"Long-term" means that governing regulations are established with the intent to remain in effect indefinitely and have no specified expiration date. However, the rules may be subject to periodic review and adjustment.

	changes occur, the status of the MPA relative to the national system could be re-evaluated. Sites and/or protections that must have a specific legislative or other administrative action to be decommissioned shall be considered to have been established with the intent to provide permanent protection. This would include, for example, sites that have a requirement for periodic renewal contingent on evaluation of effectiveness, with no specified expiration date. For sustainable production MPAs, the site must be established with the intent at the time of designation to provide, at a minimum, the duration of protection necessary to achieve the mandated long-term sustainable production objectives for which the site was established. For all MPAs, the site must provide the same level and type of protection at a fixed location and fixed and regular period of any duration during a year.	
Governing authority	"Reserved" means established by and currently subject to federal, state, local, or tribal law or regulation. Application of this criterion would exclude, for example, privately created or maintained marine sites.	"Designated" means subject to specific state, federal, tribal, or local government law, regulation, or rule. Privately created or maintained marine sites were not included in this inventory. Non-regulatory protected areas, including those created and managed by private entities including fee simple ownership and conservation easements, are excluded from the inventory because they have no specific marine resource related regulations governing their establishment or management.
Resources	"Resources" means both natural and cultural resources and values.	"Resources" means natural resources. Although the focus on the legislative definition is on natural resource, in order to preserve consistency with the federal definition, MPAs protecting cultural be considered and catalogued in the future.
Protection	"Protection" requires existing laws or regulations that are designed and applied to afford the site with increased protection for part or all of the natural and submerged cultural resources therein for the purpose of maintaining or enhancing the lasting conservation of these resources, beyond any general protections that apply outside the site. Application of this criterion would exclude restricted areas that are established for purposes other than conservation. The term would not include, for example, areas closed for navigational safety, areas closed to safeguard modern human-made structures (e.g.,	"Protection" requires existing laws, rules, or regulations, which are specifically designed to increase the level of protection of all or some of the natural resources found within that site for the purpose of maintaining or enhancing the long-term conservation of these resources. "De facto" MPAs are areas with restrictive regulations such as military installations, buoy mooring areas, or areas closed to shellfish harvest due to contamination and cable crossings. While these restrictive regulations serve to provide long-term protection to some of the marine resources within the area, the intent of the regulations is not resource protection. Therefore, these areas are

	submarine cable no-anchor zones), polluted shellfish-bed closure areas, areas closed to avoid fishing gear conflicts, and areas subject to area-based regulations that are established solely to limit fisheries by quota management or to facilitate enforcement	not included in the inventory. All marine waters within Washington State are protected from oil drilling thereby providing long-term protection to marine resources. These areas are not included in this inventory. Many marine areas are routinely closed to all or some types of fishing. While some of these areas may receive protection for lengthy periods of time (i.e., decades), the restrictions may be related to allocation, population rebuilding, or quota management and are, therefore, not included in this inventory.

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APPENDIX 1: INVENTORY OF WASHINGTON MPAS

Structure of the Inventory

The inventory consists of a summary table containing key information about each site in the inventory. Table 2 in the main report defines key terms and explains exclusions and inclusions. The format of inventory was modeled after that of the federal MPA center (www. mpa.gov) but modified to meet Washington's information needs. An inventory key (below) gives detailed information regarding the definition of each of the categories used in the inventory.

Additional information on each site is stored in a separate database which is not part of the inventory. This additional information includes details on the types of restrictions, data sources and related information and is available by request from the Department of Fish and Wildlife.

Methods and Data Sources

Much of the information was obtained from existing literature, agency web sites, and interviews with staff members. The Northwest Straits Commission provided unpublished information based on an earlier project conducted by the Commission. Key staff members from state, federal, and local agencies were contacted to provide or verify and update the information. During this screening and verification process, a standard set of questions was asked to obtain information in a consistent manner. To the extent possible, the information provided was verified.

Determination of the size of each MPA was problematic. We calculated the size in acres and the length of any shoreline in feet. If the managing agency could provide the size or shoreline length included within an MPA, we used that number directly. For those sites without existing determination of size, we calculated the size using the coordinates of the exterior boundaries of the MPA. The amount of shoreline within an MPA was determined using maps of the shoreline at high tide. For some MPAs that consist of only intertidal areas, we calculated the lengths of protected shoreline at high tide, and not the area of that MPA. To illustrate where MPAs derive protection from adjacent terrestrial parks or reserves, those beaches and areas are mapped with their terrestrial components. No terrestrial areas were summed as components of MPAs.

It is important to note that many MPAs have overlapping boundaries so that an individual location may be included in more than one MPA. The area of individual MPAs is reported in inventory; however, when tallying the total area protected by MPAs by Action Area we avoided overestimating the total area protected by not double counting overlapping areas.

We included MPAs which were in effect on December 31, 2008[7]. Any protected area which was created, or any changes in the management or boundaries of existing MPAs made, after that date were not included.

Managing Agencies

MPAs have been created by a variety of state, federal and local governments. The purpose of these MPAs usually varies by managing agency and can range from resource protection, research, public enjoyment, and habitat protection (See section below entitled "Agencies Involved with Creation and Management of MPAs"). A single MPA may have more than one purpose.

Frequently more than one agency is involved with the creation or management of an individual site. These interagency partnerships arise from shared interests and often differing regulatory authority. For example, the University of Washington has established several sites for marine research in the San Juan Islands but lacks the regulatory authority to restrict or eliminate fishing within these sites. As owner of associated tidelands, the University can restrict public access and harvest of intertidal shellfish, but lacks the authority to restrict fishing for finfish and subtidal shellfish (i.e., crabs and shrimp). The Department of Fish and Wildlife has such authority and the two agencies work together to develop compatible regulations and policies. In the inventory, the agency that issued regulations is identified as the "owner" and the agency which suggested the site and developed boundaries is identified as the "sponsor."

Geographical Distribution of MPAs in Washington Waters

To understand the distribution of MPAs throughout Washington, we divided the state's marine waters into nine geographical regions; seven in Puget Sound and two along the coast (Figure 1). In Puget Sound we utilized the Puget Sound Partnership's Action Areas[8] and along the coast we utilized the description of Water Inventory Resources Areas as follows.

Hood Canal Region: The waters of Hood Canal and the Jefferson County portion of Admiralty Inlet.

North Central Puget Sound Region: The Kitsap peninsula portion of WRIA 15 that drains to the main basin of Puget Sound. The eastern boundary is the King-Kitsap County line.

San Juan-Whatcom Region: All the waters of San Juan County and the portion of Whatcom County defined by the boundaries of the Nooksack River watershed.

South Central Region: The waters of the Seattle/Bellevue/Tacoma metro area.

Whidbey Region: The waters of the Whidbey Basin.

South Puget Sound Region: The waters south of the Tacoma Narrows.

[7] The reef net at Saltwater State Park was included although the formal process to adopt regulations for that area was not completed until early in 2009.
[8] www.psp.wa.gov/aa_action_areas.php.

Strait of Juan de Fuca Region: The waters from the northwestern tip of the Olympic Peninsula (Cape Flattery) to the eastern end of the Strait of Juan de Fuca (Point Wilson at Port Townsend).

North Coast Region: The waters from the Canadian border south to the southern end of WRIA 21; approximately 48 degrees 1 min 3.2 sec N. The western boundary is three miles from shore.

South Coast Region: The waters from the southern end of the North Coast Area south to the border with Oregon.

Table 1. Estimated size and shoreline length of each region.

REGION	SIZE (acres)	SHORELINE LENGTH (thousands of feet)
Hood Canal	135,699	1,636
North Central Puget Sound	85,837	1,099
San Juan-Whatcom	510,965	2,971
South Central	127,301	1,505
Whidbey	344,214	2,583
South Puget Sound	108,553	2,288
Strait of Juan de Fuca	529,841	1,036
North Coast	298,061	901
South Coast	293,461	2,353
TOTAL	2,433,931	16,372

Protection Level

MPAs are intended to provide protection to natural resources and/or their habitat. The protection can be provided by two major approaches: 1) protecting natural resources directly by restricting harvest activities such as fishing; and 2) protecting habitat by restricting human activities such as construction, anchoring, or public access. The approach used varies by managing agency and is a reflection of that agency's management goals and authorities. See below for a description of the managing agencies' goals. For example, the Washington Department of Fish and Wildlife focuses on habitat protection. Some agencies, such as Parks and Recreation Commission encourage visits at state parks (which are included in the inventory of MPAs) while the Department of Natural Resources discourages or prohibits public access to some of its preserves. Likewise, at the federal level, the U.S. Fish and Wildlife Service prohibits public access at some of its refugees, while the Olympic National Park encourages public use of its shoreline.

Washington State Marine Protected Area Inventory

Managing Agency Owner/Sponsor		Name of Protected Area	Action Area	Acreage	Shoreline (in feet)	Year Established	Protection Level	Harvest Restrictions	Non-Harvest Restrictions
Clallam County									
	*	Tongue Point Marine Life Sanctuary/Salt Creek Recreation Area	STRAIT	24.71	9,181	1989	UML	ResAll	
Edmonds, City of									
WDNR		Edmonds Underwater Park (AKA Brackett's Landing)	SCPS	46.90	2,185	1970	NTL	ProAll	A
National Oceanic and Atmospheric Administration (NOAA)									
		Olympic Coast National Marine Sanctuary	NCOAST	309,112.72	1,310,915	1994	UML	NoRstr	O
National Park Service (NPS)									
	*	Olympic National Park	NCOAST	0.00	333,301	1909	NIL	ResAll	O
WDNR	*	San Juan Island National Historical Park	SANJI	1,752.00	36,976	1961	NIL	ResAll	V+O
Seattle, City of									
WDFW	*	Carkeek Park	SCPS	24.65	1,883	2005	ZNL	ResAll	
WDFW	*	Discovery Park	SCPS	40.98	2,950	2005	ZNL	ResAll	
WDFW	*	Emma Schmitz Memorial Marine Preserve	SCPS	6.34	717	2005	ZNL	ResAll	
WDFW	*	Golden Gardens Marine Preserve Park	SCPS	13.87	1,431	2005	ZNL	ResAll	
WDFW	*	Lincoln Park Marine Preserve	SCPS	10.16	2,466	1922	ZNL	ResAll	
WDFW	*	Richey Viewpoint Marine Preserve	SCPS	11.58	1,686	2005	ZNL	ResAll	
Tacoma, City of									
WDNR	*	Middle Waterway	SCPS	1.85	200	1997	UML	NoRstr	C+O
WDNR	*	Olympic View Resource Area	SCPS	10.90	857	1997	UML	NoRstr	C+O
United States Fish and Wildlife Service (USFWS)									
	*	Copalis National Wildlife Refuge	NCOAST		179,030	1907	NAL	ResAll	O
!	*	Dungeness National Wildlife Refuge	STRAIT	1,004.05	74,546	1915	ZML	ResAll	V+A+S+C+O
	*	Flattery Rocks National Wildlife Refuge	NCOAST		84,465	1907	NAL	ResAll	O
	*	Grays Harbor National Wildlife Refuge	SCOAST		26,500	1990	NIL	ProAll	V+A+S+C+O
	*	Nisqually National Wildlife Refuge	SPS		58,161	1974	XML	ResAll	V+A+S+C+O
	*	Protection Island National Wildlife Refuge	STRAIT	527.15	25,284	1982	NAL	ResAll	V+A+S+C+O
	*	Quillayute Needles National Wildlife Refuge	NCOAST		357,996	1907	NAL	ResAll	O
	*	San Juan Islands National Wildlife Refuge	SANJI		78,092	1960	NAL	ResAll	O
	*	Willapa National Wildlife Refuge	SCOAST		331,012	1936	ZML	ResAll	O
University of Washington (UW)									
FHL	*	San Juan County/Cypress Island Marine Biological Preserve	SANJI	292,413.87	2,251,339	1923	UML	ResAll	C
Washington Department of Ecology (WDOE)									
WDOE		Padilla Bay National Estuarine Research Reserve	WHIB	12,074.87	150,926	1980	UML	NoRstr	O
Washington Department of Fish and Wildlife (WDFW)									
		Admiralty Head Marine Preserve	WHIB	88.40	0	2002	UML	ResAll	
UW		Argyle Lagoon Marine Preserve	SANJI	13.00	3,252	1990	UML	ProRec/ResCom	
Edmonds, City of		Brackett's Landing Shoreline Sanctuary Conservation Area	SCPS	46.90	2,185	1970	NTL	ProAll	
Des Moines, City of		City of Des Moines Park Conservation Area	SCPS	9.20	1,077	1998	NTL	ProAll	
	*	Colvos Passage Marine Preserve	NCPS	3.30	502	2000	UML	ResRec	
UW / FHL	*	False Bay San Juan Islands Marine Preserve	SANJI	94.70	14,560	1990	UML	ResAll	
UW / FHL		Friday Harbor San Juan Islands Marine Preserve	SANJI	427.20	13,861	1990	UML	ResAll	
		Keystone Harbor Conservation Area	WHIB	11.40	673	2002	NTL	ProAll	
		McNeil Island Wildlife Area (Includes Gertrude and Pitt Islands)	SPS	0.00	56,341	1984	NAL	ProAll	A+S+O

Managing Agency Owner/Sponsor		Name of Protected Area	Action Area	Acreage	Shoreline (in feet)	Year Established	Protection Level	Harvest Restrictions	Non-Harvest Restrictions
	*	Octopus Hole Conservation Area	HOOD	32.60	2,400	1998	NTL	ProAll	
		Orchard Rocks Conservation Area	NCPS	103.70	20	1998	NTL	ProAll	
		Saltar's Point Beach Conservation Area	SPS	4.50	921	2000	NTL	ProAll	
WPRC		Saltwater Underwater Park	SPS	9.84	300	2009	UML	ResRec	A
UW	*	Shaw Island San Juan Islands Marine Preserve	SANJI	432.50	17,177	1990	UML	ResAll	
Des Moines, City of		South 239th Street Park Conservation Area	SCPS	0.20	16	1998	NTL	ProAll	
		Sund Rock Conservation Area	HOOD	71.20	2,866	1994	NTL	ProAll	
Metro/Tacoma		Titlow Beach Marine Preserve	SPS	41.70	2,838	1994	UML	ResAll	
		Toliva Shoal Closed Area	SPS	162.50		2005	UML	ResAll	
	!	Waketickeh Creek Conservation Area	HOOD	146.30	0	2000	NTL	ProAll	
TNC/UW		Yellow and Low Islands San Juan Islands Marine Preserve	SANJI	187.20	4,266	1990	UML	ResAll	
		Zee's Reef Marine Preserve	SCPS	55.95	0	2002	UML	ResAll	
	*	Zella M. Schultz Seabird Sanctuary	STRAIT	0.00	5,083	1975	NAL	ProAll	V+A+S
Washington Department of Natural Resources (WDNR)									
TNC	*	Bone River Natural Area Preserve	SCOAST	7.32	3,170	1987	NAL	ProAll	V+S+O+A
		Cherry Point Aquatic Reserve	SANJI	3,092.10	20,959	2000	UML	ResAll	
	*	Cypress Island Aquatic Reserve	WHIB	5,982.96	101,592	2007	UML	ResAll	V+S+O+A
	*	Dabob Bay Natural Area Preserve	HOOD	0.00	15,158	1987	NAL	ProAll	S+O
	*	Elk River Natural Resources Conservation Area	SCOAST	150.79	106,784	1986	UML	ResAll	
	*	Fidalgo Bay Aquatic Reserve	WHIB	694.62	14,189	2008	UML	ResAll	
		Gunpowder Island Natural Area Preserve	SCOAST	0.00	0	1981	NIL	ResAll	
		Kennedy Creek Natural Area Preserve	SPS	37.87	9,867	1990	NAL	ProAll	O+S
		Maury Island Aquatic Reserve	SCPS	5,531.04	11,921	2000	UML	NoRstr	V+A
	*	Niawiakum River Natural Area Preserve	SCOAST	0.00	56,126	1987	NAL	ProAll	
	*	North Bay Natural Area Preserve	SCOAST	409.87	7,742	1988	NAL	ProAll	S
	*	Skookum Inlet Natural Area Preserve	SPS	57.18	3,524	1986	NAL	ProAll	S
	*	Whitcomb Flats Natural Area Preserve	SCOAST				NIL	ResAll	
	*	Woodard Bay Natural Resources Conservation Area	SPS	44.63	30,537	1987	UML	ResRec	
Washington Parks and Recreation Commission (WPRC)									
	*	Bay View State Park	WHIB	37.18	1,285	1924	UML	ResAll	O
	*	Belfair State Park	HOOD	40.11	3,780	1952	UML	ResAll	O
	*	Birch Bay State Park	SANJI	225.10	7,915	1954	UML	ResAll	O
	*	Blake Island State Park/Underwater Park	NCPS	131.26	16,570	1974	UML	ResAll	O
	*	Blind Island Marine State Park	SANJI	1.00	1,280	1971	UML	ResAll	O
	*	Bottle Beach State Park	SCOAST	5.90	6,844	2008	UML	ResAll	O
	*	Burrows Island State Park	WHIB	0.51	11,939	1978	UML	ResAll	O
	*	Cama Beach State Park	WHIB	26.96	4,796	2008	UML	ResAll	O
	*	Camano Island State Park	WHIB	46.69	6,700	1958	UML	ResAll	O
	*	Cape Disappointment State Park	SCOAST	139.78	42,860	1938	UML	ResAll	O
	*	Clark Island State Park	SANJI	3.47	11,292	1964	UML	ResAll	O
	*	Cone Islands State Park	WHIB	10.84	2,500	1973	UML	ResAll	O
	*	Cutts Island State Park (AKA Deadman's Island)	SPS	2.00	2,100	1969	UML	ResAll	O
	*	Damon State Park	SCOAST	28.30	6,400	2002	UML	ResAll	O
	*	Dash Point State Park	SCPS	56.89	3,251	1962	UML	ResAll	O
	*	Deception Pass State Park/Underwater Park	WHIB	163.32	78,714	1925	UML	ResAll	O
	*	Doe Island State Park	SANJI	2.45	2,050	1967	UML	ResAll	
	*	Dosewallips State Park	HOOD	229.47	5,500	1954	UML	ResAll	
	*	Fay-Bainbridge State Park	NCPS	10.39	1,420	1944	UML	ResAll	O
	*	Fort Casey State Park	WHIB	26.70	15,635	1980	NTL	ResAll	A
!	*	Fort Ebey State Park	WHIB	17.07	7,400	1981	UML	ResAll	O
!	*	Fort Flagler State Park	HOOD	121.48	19,100	1955	UML	ResAll	O
	*	Fort Ward State Park	NCPS	13.40	4,300	1969	UML	ResAll	O
	*	Fort Worden State Park	STRAIT'	21.73	11,020	1965	NTL	ResAll	A
	*	Griffiths Priday State Park	SCOAST	0.00	5,507	1952	NAL	ResAll	A
	*	Haley Property	SPS	32.99	1,980	1978	UML	ResAll	O

Managing Agency Owner/Sponsor		Name of Protected Area	Action Area	Acreage	Shoreline (in feet)	Year Established	Protection Level	Harvest Restrictions	Non-Harvest Restrictions
	*	Hope Island State Park (Mason County)	SPS	25.36	8,541	1990	UML	ResAll	O
	*	Hope Island State Park (Skagit County)	WHIB	37.21	13,675	1925	UML	ResAll	O
	*	Huckleberry Island State Park	WHIB	10.00	2,900	1991	UML	ResAll	O
	*	Iceberg Island State Park	SANJI	0.00	1,380	1976	UML	ResAll	O
	*	Illahee State Park	NCPS	10.05	1,785	1934	UML	ResAll	O
	*	James Island State Park	SANJI	15.45	12,335	1964	UML	ResAll	O
	*	Jarrell Cove State Park	SPS	6.41	3,506	1969	UML	ResAll	O
	*	Joseph Whidbey State Park	WHIB	66.01	3,100	1982	UML	ResAll	O
	*	Kitsap Memorial State Park	HOOD	4.44	1,797	1949	UML	ResAll	O
	*	Kopachuck State Park/Underwater Park	SPS	528.98	5,600	1972	UML	ResAll	O
	*	Larrabee State Park	WHIB	14.61	8,100	1915	UML	ResAll	O
	*	Lilliwaup State Park	HOOD	20.70	4,122	1961	UML	ResAll	O
	*	Manchester State Park	NCPS	20.65	3,400	1970	UML	ResAll	O
USFWS	*	Matia Island State Park	SANJI	150.00	20,709	1959	ZNL	ResAll	A
	*	McMicken Island State Park	SPS	12.70	3,361	1974	UML	ResAll	O
	*	Moran State Park	SANJI	8.12	13,840	1921	UML	ResAll	O
	*	Mud Bay Tidelands	SANJI	73.37	11,360	1967	UML	ResAll	O
	*	Mystery Bay State Park	HOOD	6.65	685	1972	UML	ResAll	O
	*	Old Fort Townsend State Park	HOOD	20.04	8,810	1958	UML	ResAll	O
	*	Olga State Park	SANJI	1.41	60	1962	UML	ResAll	O
	*	Penrose Point State Park	SPS	82.11	9,280	1953	UML	ResAll	O
	*	Pleasant Harbor State Park	HOOD	0.12	100	1955	UML	ResAll	O
	*	Possession Point	WHIB	19.47	2,500	2001	UML	ResAll	O
	*	Potlatch State Park	HOOD	86.09	9,570	1960	UML	ResAll	O
	*	Right Smart Cove State Park	HOOD	0.71	200	1978	UML	ResAll	O
	*	Saddlebag Island State Park	SANJI	4.71	6,250	1974	UML	ResAll	O
	*	Saltwater State Park	SPS	0.00	1,445	1929	NTL	ResAll	A
	*	Scenic Beach State Park	HOOD	6.95	1,487	1963	UML	ResAll	O
	*	Seashore Conservation Area	SCOAST	5,856.25	284,178	1967	UML	ResAll	O
	*	Sequim Bay State Park	STRAIT	16.34	4,909	1936	UML	ResAll	O
	*	Skull Island State Park	SANJI	0.00	1,654	1960	ZNL	ResAll	O
	*	South Whidbey State Park	WHIB	21.03	4,500	1963	UML	ResAll	O
	*	Spencer Spit State Park (Lopez Island State Park)	SANJI	78.70	7,840	1967	UML	ResAll	O
	*	Stretch Point State Park	SPS	5.37	610	1967	UML	ResAll	O
	*	Stuart Island State Park	SANJI	15.29	4,790	1952	UML	ResAll	O
	*	Sucia Island State Park	SANJI	229.15	77,700	1952	ZNL	ResAll	A
	*	Toandos Peninsula Tidelands State Park	HOOD	62.49	10,418	1967	UML	ResAll	O
	*	Tolmie State Park/Underwater Park	SPS	25.02	1,800	1962	UML	ResAll	O
	*	Triton Cove State Park	HOOD	3.54	555	1990	UML	ResAll	O
	*	Twanoh State Park	HOOD	9.73	3,167	1923	UML	ResAll	O
	*	Wolfe Property State Park	HOOD	124.83	16,092	1967	UML	ResAll	O

* Indicates upland component associated with this MPA
! Indicates seasonal protection

Inventory Key

Column Label	Description
Management agency	Agency involved in administering the area-usually the agency adopting laws, rules or ordinances to create and manage the MPA
Sponsor	Agency or private group which oversees day to day management and may conduct monitoring or develop management plan
Name of Protected Area	Legal or commonly used name of an individual site. May be named for a nearby geographical feature
Acreage	The size of an MPA including intertidal and subtidal areas. Derived from information provided by agencies or from GIS information
Shoreline (ft)	The number of feet of shoreline included within the boundaries of an MPA. Measured at ordinary high tide line
Protection Level	A measure of how restricted the harvest regulation are at the site.
NAL	*No access* MPAs restrict all human access in order to prevent potential ecological disturbance. Types of no access MPAs are those that protect marine animals during sensitive life stages, or serve as areas for research in the absence of any human activities
NIL	*No Impact* MPAs or zones that allow human access, but that prohibit all activities that could harm the site's resources or disrupt the ecological or cultural services they provide.
NTL	*No Take* MPAs or zones that allow human access and even some potentially harmful uses, but that totally prohibit the extraction or significant destruction of natural or cultural resources.
UML	*Uniform Multiple Use* MPAs or zones with a consistent level of protection and allowable activities, including certain extractive uses, across the entire protected area.
ZML	*Zoned Multiple Use* MPAs that allow some extractive activities throughout the entire site, but that use marine zoning to allocate specific uses to compatible places or times in order to reduce user conflicts and adverse impacts.
ZNL	*Zoned Multiple-Use With No-Take Area(s)* are multiple-use MPAs that contain at least one legally established management zone in which all resource extraction is prohibited.
Constancy	Time periods/durations of protections
YP	Year-Round protection- protections are in effect all year, every year
RP	Rotational Protection-protections are in effect all year but not every year.
SP	Seasonal Protection-protections are in effect part of each year.
Protection Focus	General expanse of protection
ES	Ecosystem Scale
FS	Focal Scale

Column Label	Description
Conservation Focus	Main reason for creating/maintaining the area
NH	Natural Heritage MPAs or zones established and managed wholly or in part to sustain, conserve, restore, and understand the protected area's natural biodiversity, populations, communities, habitats, and ecosystems; the ecological and physical processes upon which they depend; and, the ecological services, human uses and values they provide to this and future generations.
SP	Sustainable Production MPAs or zones established and managed wholly or in part with the explicit purpose of supporting the continued extraction of renewable living resources (such as fish, shellfish, plants, birds, or mammals) that live within the MPA, or that are exploited elsewhere but depend upon the protected area's habitat for essential aspects of their ecology or life history.
NHCH	Natural Heritage and Cultural Heritage
NHSP	Natural Heritage and Sustainable Production
Harvest Restrictions	Any limitations on commercial and recreational harvest activity
NoRstr	No restrictions to harvest
ProAll	All harvest prohibited
ProCom	Commercial harvest prohibited
ProRec	Recreational harvest prohibited
ResAll	All harvest restricted
ResCom	Commercial harvest restricted
ResRec	Recreational harvest restricted
Non-harvest Restriction	
V	Vessel access prohibited or restricted
A	Anchoring prohibited or restricted
S	Shore access prohibited or restricted
C	Intertidal construction prohibited or restricted.
O	Other restrictions (see notes)
Management Plan Type	
SS	Site specific plan
PR	Part of a larger programmatic MPA plan
FMP	Broader fishery MP
HMP	Broader habitat MP
DE	Designated by enabling legislation
CA	Community agreement
Column Label	Description

Column label	Description
Plan Development Stage	
0	No plan in effect or planned
1	Planned – not yet in draft
2	Draft – Plan being developed
3	Complete

Abbreviations used to Identify Organizations

ABBREVIATION	ORGANIZATION
DOE	Washington Department of Ecology
DNR	Washington Department of Natural Resources
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
TNC	The Nature Conservancy
USFWS	United States Fish and Wildlife Service
UW	University of Washington
WDFW	Washington Department of Fish and Wildlife
WPRC	Washington Parks and Recreation Commission

Inventory Results

A total of 127 sites were identified as MPAs in this inventory. These sites occur in all regions and include approximately 644,000 acres and over six million feet of shoreline. Approximately 26% of the state's marine waters are including within the boundaries of a MPA as is 27% of the shoreline. Figures 2 through 19 display the MPAs by managing agency and also by protection level.

Managing Agencies

A combination of twelve federal, state, and local agencies has created and manages MPAs in Washington (Table 2). State agencies are responsible for the greatest number of MPAs, but the amount of acreage and shoreline is nearly equally divided between state and federal agencies (Table 3).

Table 2. Management Authority for MPAs in Washington Waters.

AGENCY	NUMBER OF MPAs	SIZE (Acres)	SHORELINE (Thousands of feet)
Clallam County	1	25	9
Edmonds	1	47	2
NOAA	1	309,113	1,310
NPS	2	1,752	370
Seattle	6	108	11
Tacoma	2	13	1
USFWS	9	1,531	1,215
UW	1	292,414	2,251
WDFW	22	1,942	128
WDNR	14	16,008	382
WDOE	1	12,075	151
WPRC	67	9,075	860

Table 3. Management of MPAs by level of government.

GOVERNMENT LEVEL	NUMBER OF MPAs (% of total)	SIZE (acres) (% of total)	SHORELINE (thousands of feet) (% of total)
Local	10 (8%)	193 (0%)	23 (0%)
State	105 (83%)	331,514 (51%)	3,774 (56%)
Federal	12 (9%)	312,396 (49%)	2,931 (44%)

Date Established

The first MPA was created in 1907 and the number and size of the MPAs has increased since (Table 4).

Table 4. Creation of MPA by Time Period

TIME PERIOD ESTABLISHED	NUMBER ESTABLISHED	SIZE (acres)	CUMULATIVE NUMBER	CUMULATIVE SIZE (acres)
1900-1919	6	1,018	6	1,018
1920-1929	8	292,679	14	293,698
1930-1939	4	166	18	293,864
1940-1949	2	15	20	293,879
1950-1959	12	1,160	32	295,039
1960-1969	23	8,236	55	303,274
1970-1979	17	845	72	304,118
1980-1989	15	13,406	87	317,525
1990-1999	19	310,615	106	628,141
2000-2008	21	15,901	127	644,101

Size

The average size of an MPA is slightly over 5, 400 acres. The size of individual MPAs range from less than one acre to over 300,000 acres. There are wide differences in average size by managing agency; local agencies have the smallest MPAs, federal agencies and state agencies (except the University of Washington) tend to be intermediate in size (Table 5).

Table 5. Size of MPAs by managing agency.

Managing Agency	**Average size of MPA (acres)**
Clallam County	25
Edmonds	47
NOAA	160,594
NPS	876
Seattle	18
Tacoma	6
USFWS	766
UW	292,414
WDFW	88
WDNR	1,231
WDOE	12,074
WPRC	135
AVERAGE	5,413

Geographical Distribution of MPAs

MPAs occur in all regions of Washington with the largest occurring in the San Juan-Whatcom and North Coastal areas (Table 6).

Table 6. Distribution of MPAs within Washington's marine waters.

REGION	NUMBER OF MPAs (% of Total)		SIZE IN ACRES (% in Total Area)		SHORELINE IN THOUSANDS OF FEET (% of Total Shoreline)	
Hood Canal	19	(15%)	1,526	(1%)	93	(6%)
North Coast	5	(4%)	281,492	(94%)	860	(95%)
North Central Puget Sound	7	(6%)	814	(1%)	26	(2%)
San Juan-Whatcom	24	(19%)	290,088	(57%)	2,205	(74%)
South Coast	13	(10%)	12,967	(4%)	616	(13%)
South Central Puget Sound	15	(12%)	5,825	(5%)	18	(0%)
Southern Puget Sound	19	(15%)	3,456	(1%)	137	(6%)
Strait of Juan de Fuca	5	(5%)	29,813	(1%)	107	(10%)
Whidbey	19	(15%)	20,244	(1%)	349	(14%)
TOTAL	127		646,226		4,412	(27%)

Restricted Activities

By design, MPAs restrict human activities within their boundaries. These restrictions can affect both harvest (fishing, shellfishing) and non-harvest activities (access, anchoring, etc). Almost all (97%) of the MPAs restrict harvest in some manner; 81% allow some limited harvest, and 16% completely prohibit harvest. About 77% of the MPAs restrict non-harvest activities (Table 7).

Table 7. Restricted Activities within MPAs

Region		Harvest restricted	Harvest prohibited[9]	No harvest restrictions	Other (non-harvest) restrictions in place
Hood Canal					
	Number.	15	4	0	15
	Size(acres)	737	250	0	
	Shoreline*	85	20	0	
North Central Puget Sound					
	Number.	6	1	0	5
	Size(acres)	1893	104	0	
	Shoreline*	28	0	0	
South Central Puget Sound					
	Number.	18	4	3	5
	Size(acres)	314	9	5,544	
	Shoreline*	19	1	13	
South Puget Sound					
	No.	15	4	0	15
	Size(acres)	979	100	0	
	Shoreline*	130	71	0	
Whidbey					
	Number.	17	1	1	15
	Size(acres)	7,340	11	12,000	
	Shoreline*	279	1	151	
San Juan Whatcom					
	Number.	24	0	0	24
	Size(acres)	299,221	0	0	
	Shoreline*	2,621	0	0	
Strait					
	Number.	4	2	0	5
	Size(acres)	1,067	527	0	
	Shoreline*	100	30	0	
North Coast					
	Number.	5	0	0	5
	Size(acres)	309,113	0	0	
	Shoreline	2,266	0	0	
South Coast					
	Number.	9	4	0	9
	Size(acres)	6,181	417	0	
	Shoreline*	783	94	0	
TOTAL					
	Number.	103	20	4	98
	Size(acres)	625,141	1,418	17,544	
	Shoreline*	6,311	217	163	

[9] Harvest is prohibited by managing agency; some limited harvest may be allowed in special circumstances.
*Shoreline is expressed in thousands of feet.

Management Plans

Each MPA had a written management plan associated with their creation of management. These plans varied from detailed, site specific plans to general, programmatic plans intended to cover a large number of MPAs managed by a single agency.

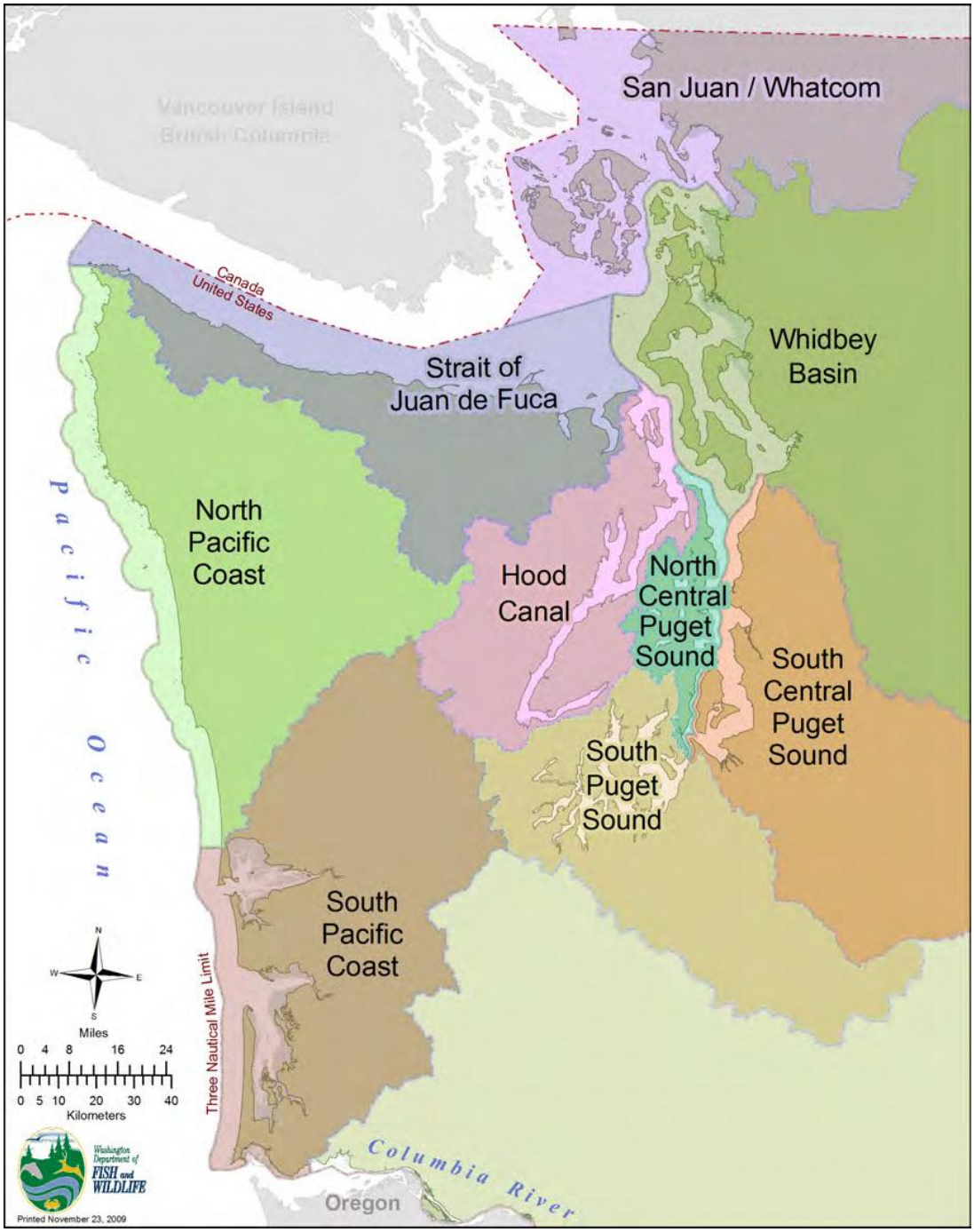

Figure 1. Map of seven Puget Sound Action Areas and two coastal areas.

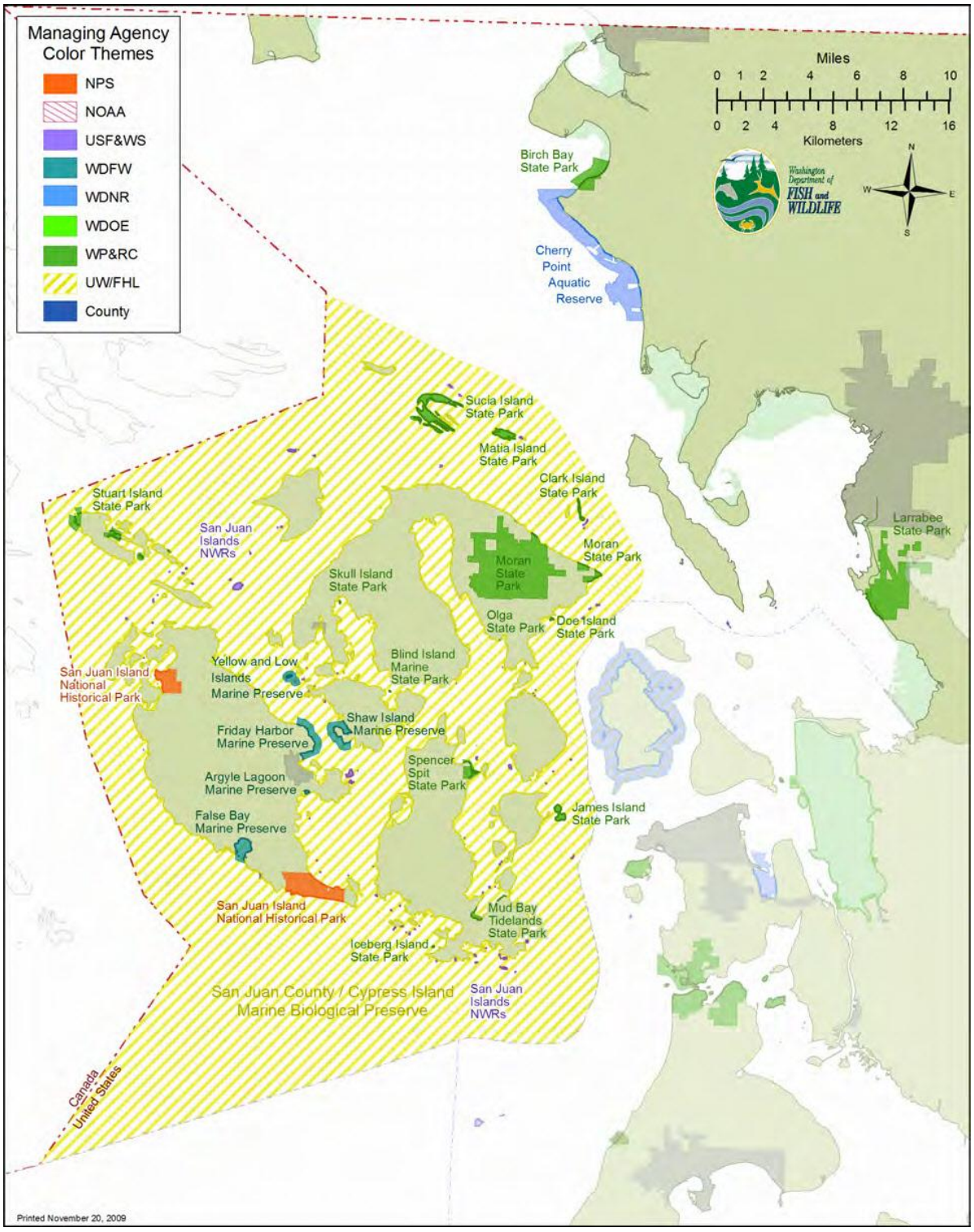

Figure 2. MPAs by managing agency in the San Juan – Whatcom Action Area. Please note that Matia Island is a U.S. Fish and Wildlife Service National Wildlife Refuge. However, Matia Island State Park is operated by and attributed on this map to Washington State Parks and Recreation Commission.

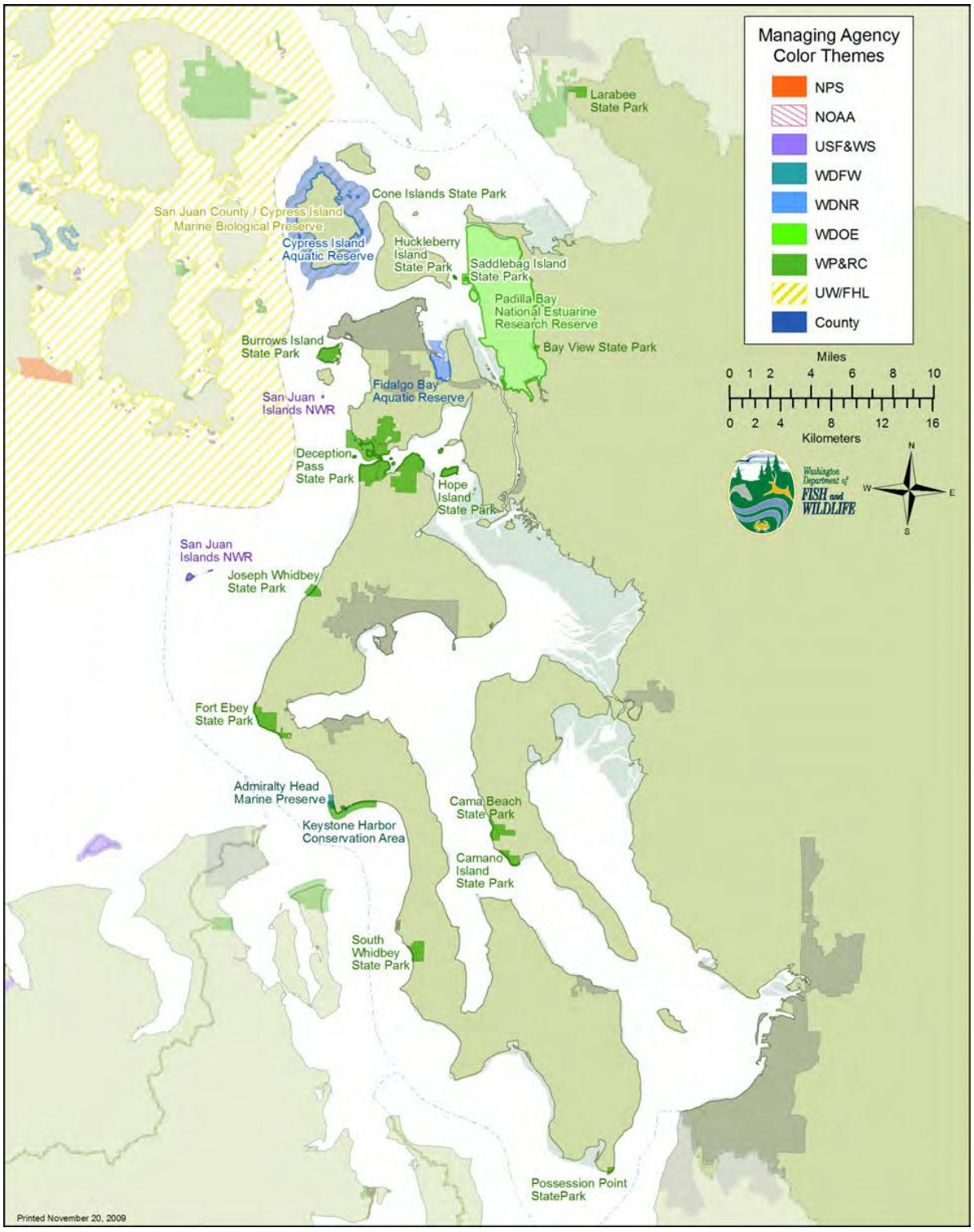

Figure 3. MPAs by managing agency in the Whidbey Action Area.

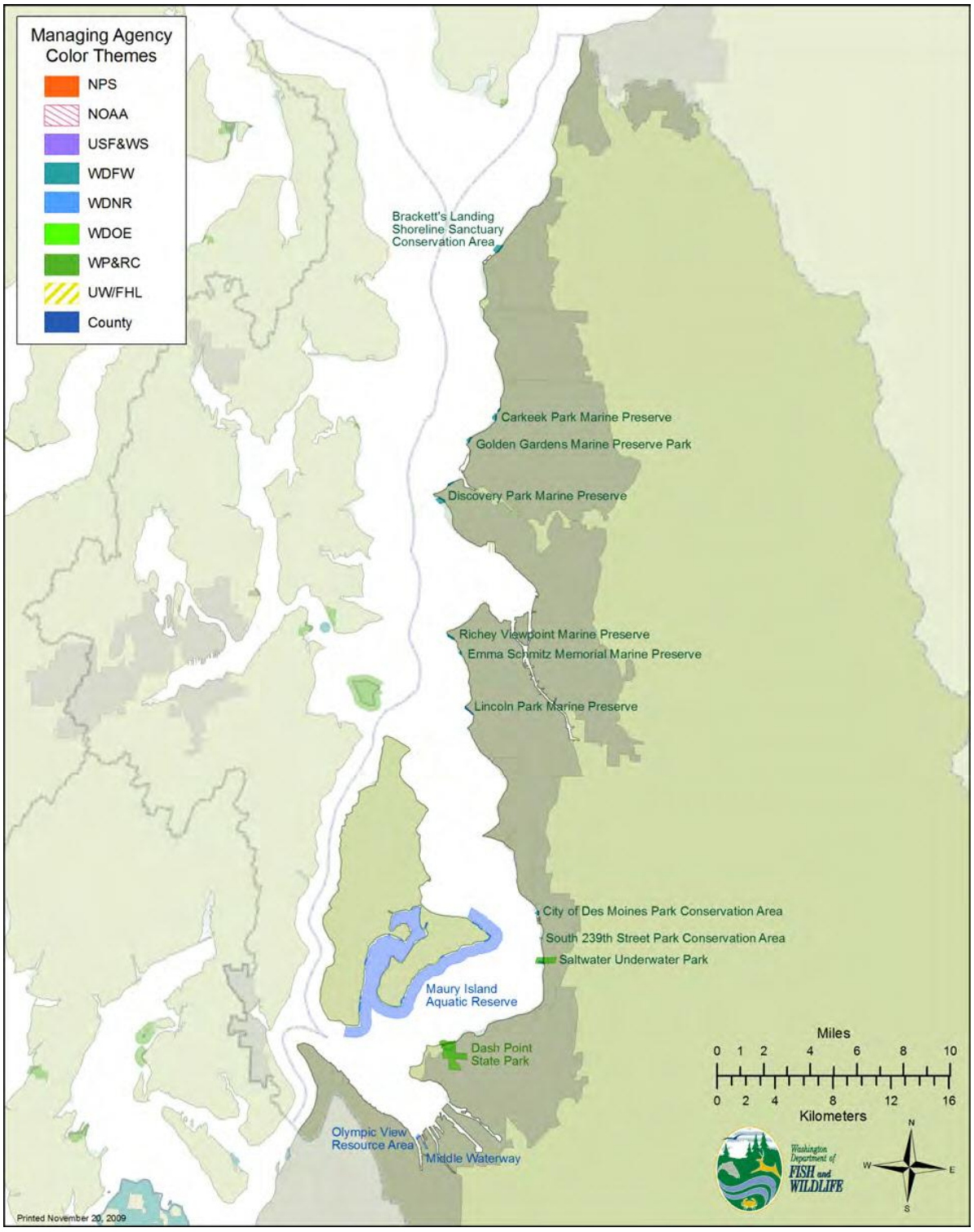

Figure 4. MPAs by managing agency in the South Central Puget Sound Action Area.

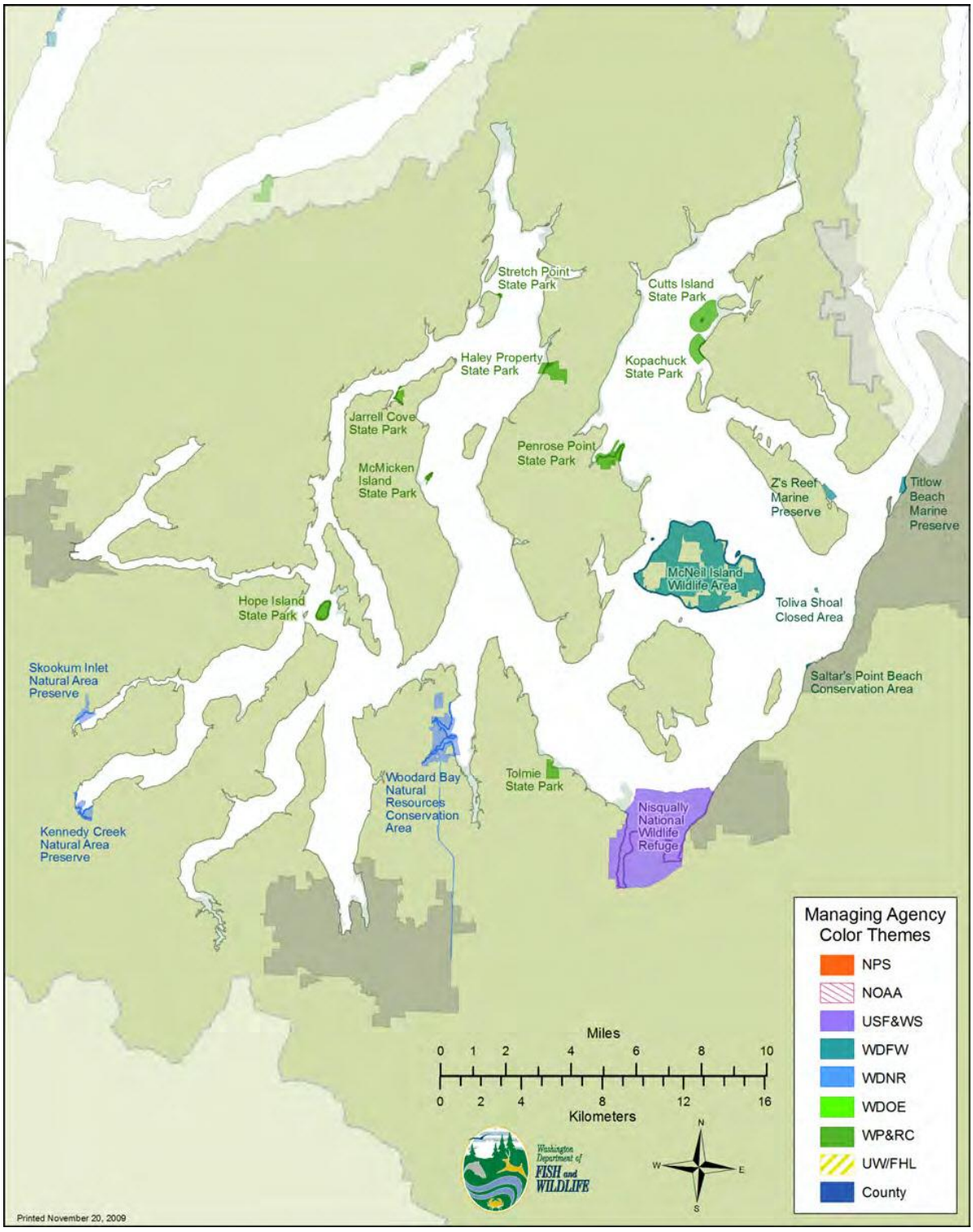

Figure 5. MPAs by managing agency in the South Puget Sound Action Area.

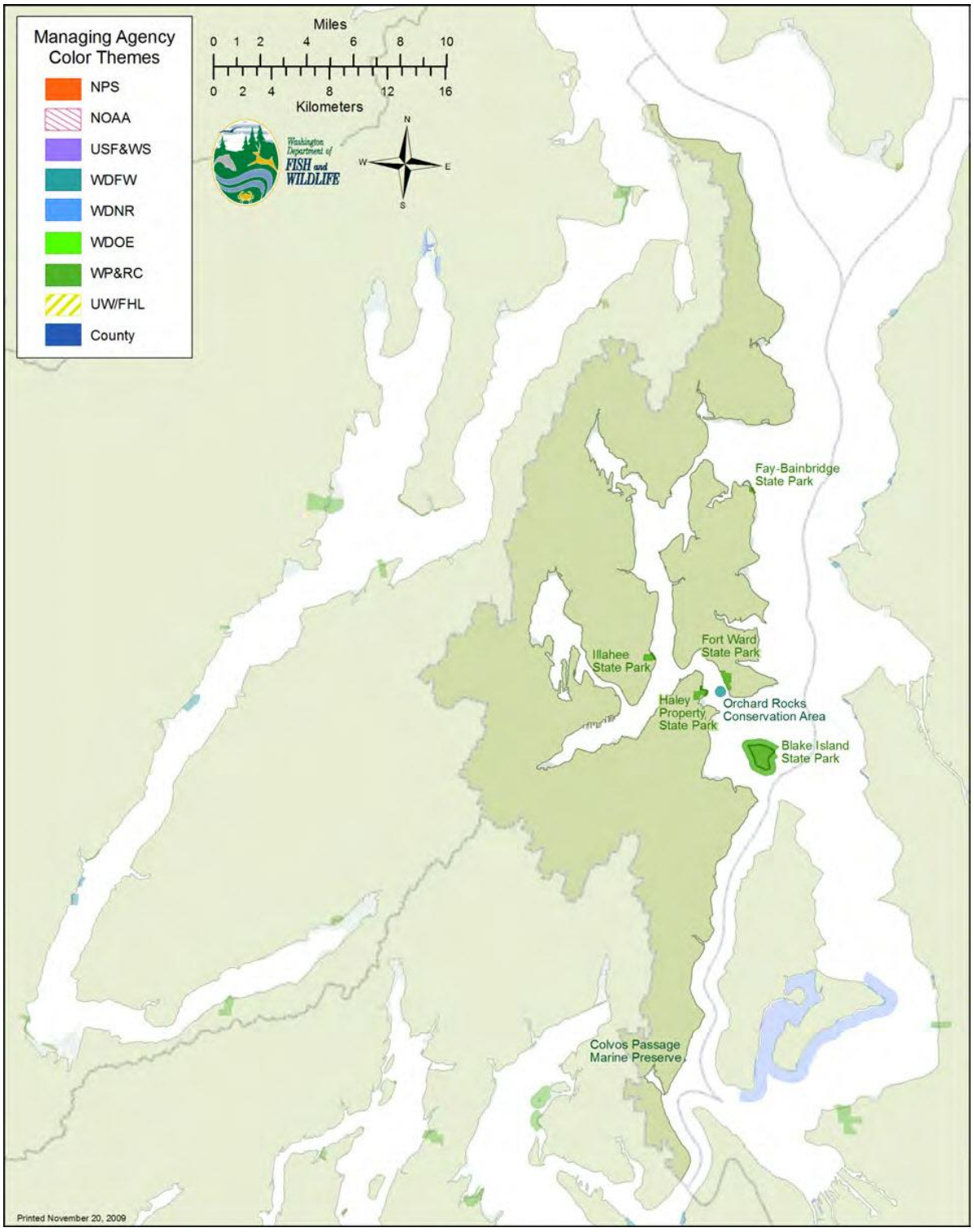

Figure 6. MPAs by managing agency in the North Central Puget Sound Action Area.

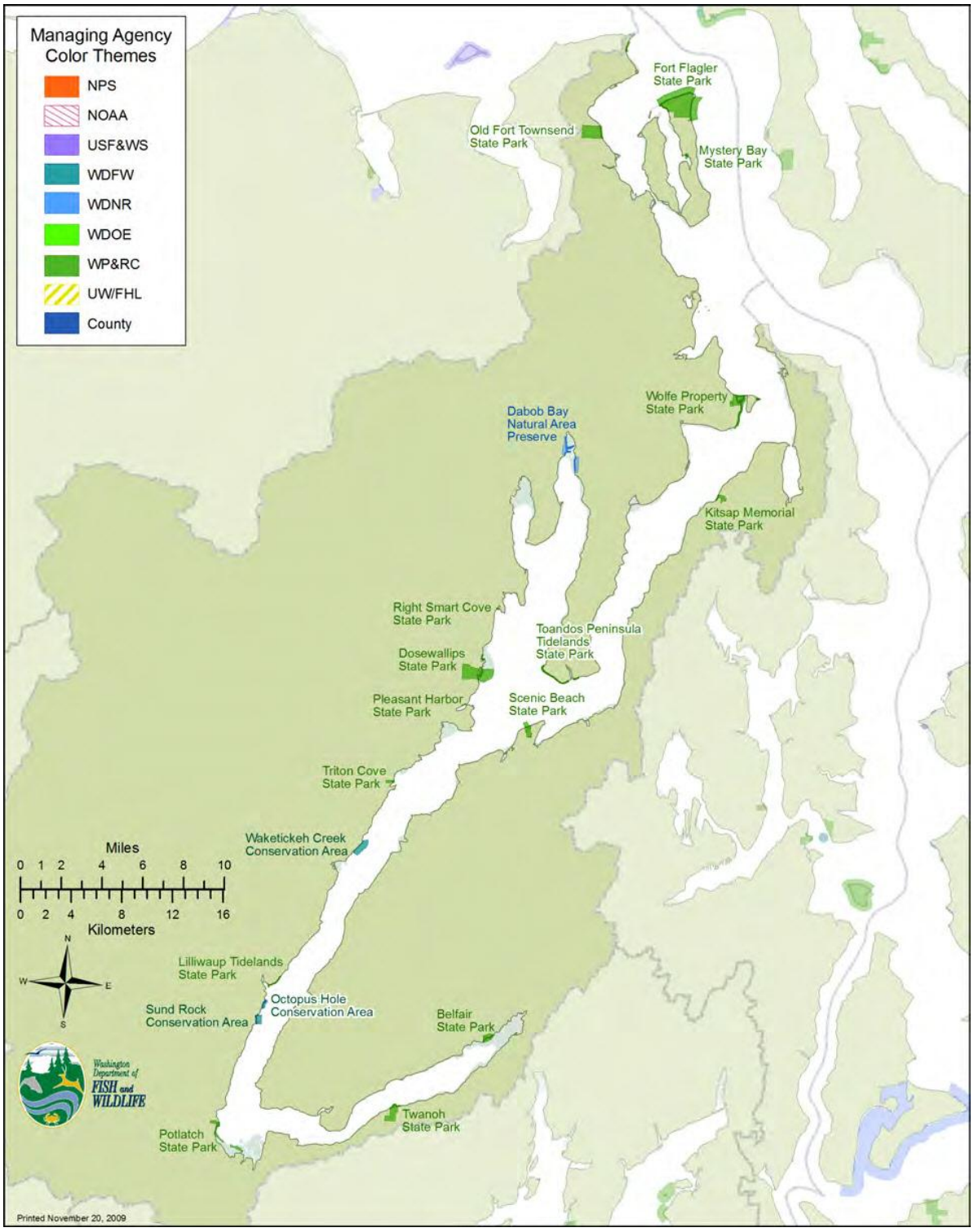

Figure 7. MPAs by managing agency in the Hood Canal Action Area.

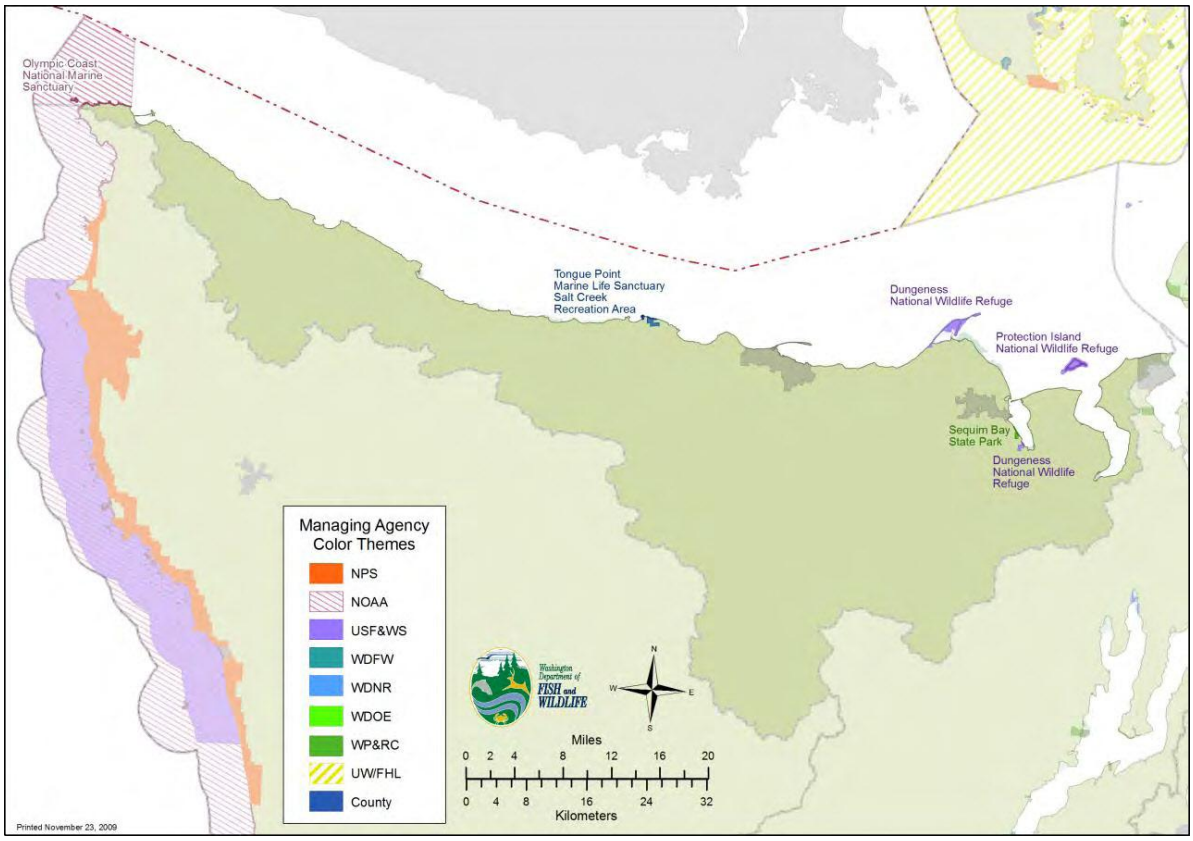

Figure 8. MPAs by managing agency in the Strait of Juan de Fuca Action Area.

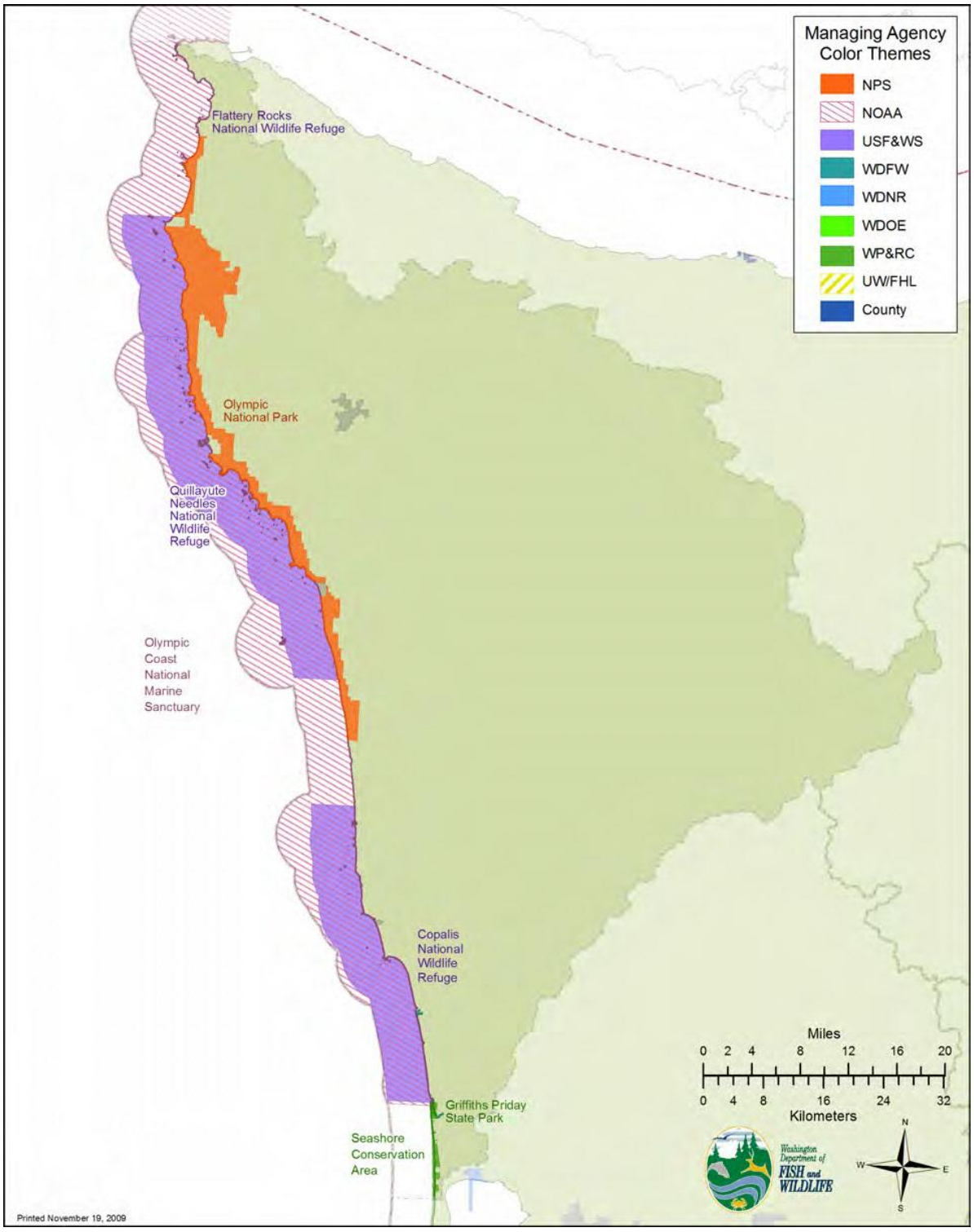

Figure 9. MPAs by managing agency in the North Coast area.

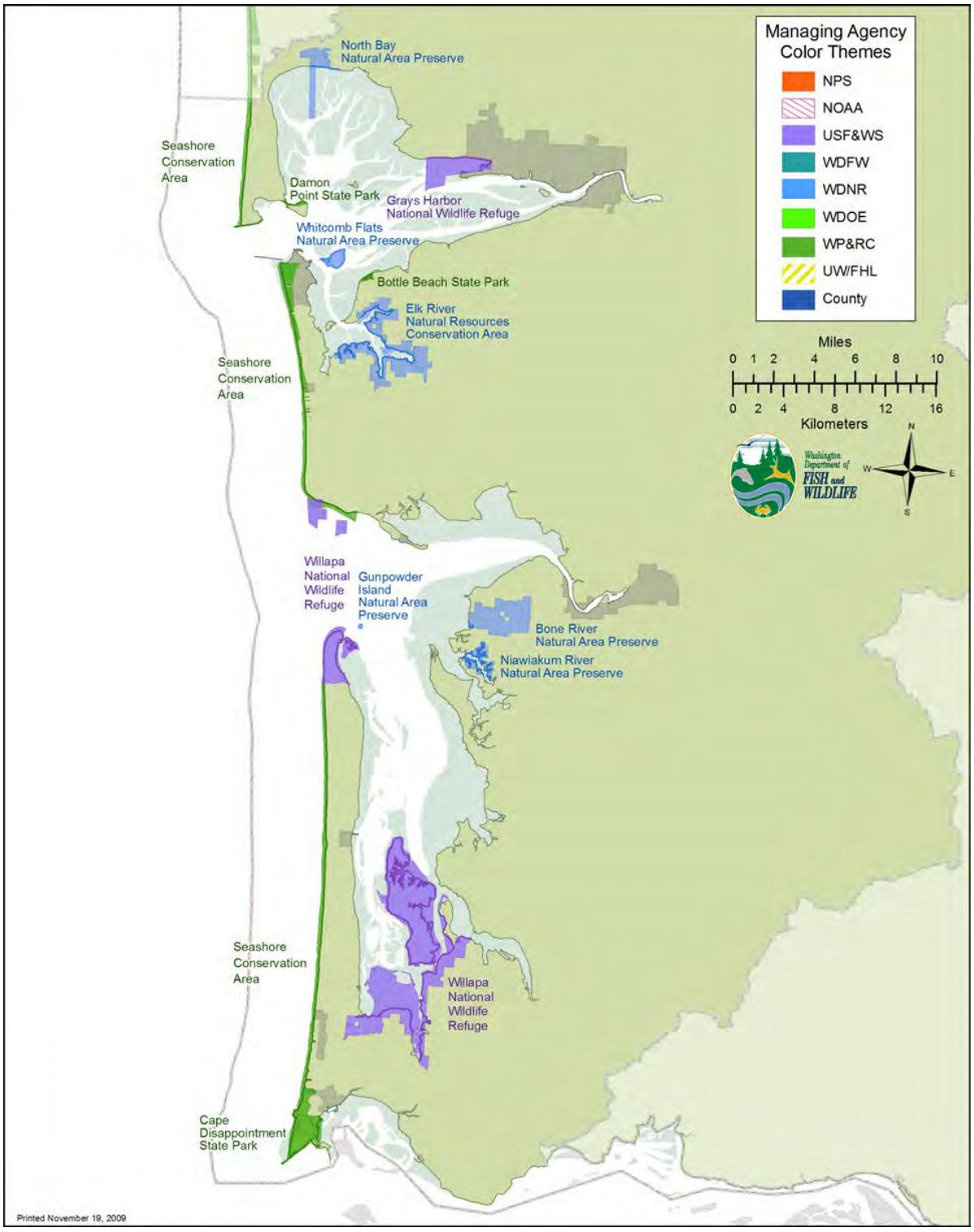

Figure 10. MPAs by managing agency in the South Coast area.

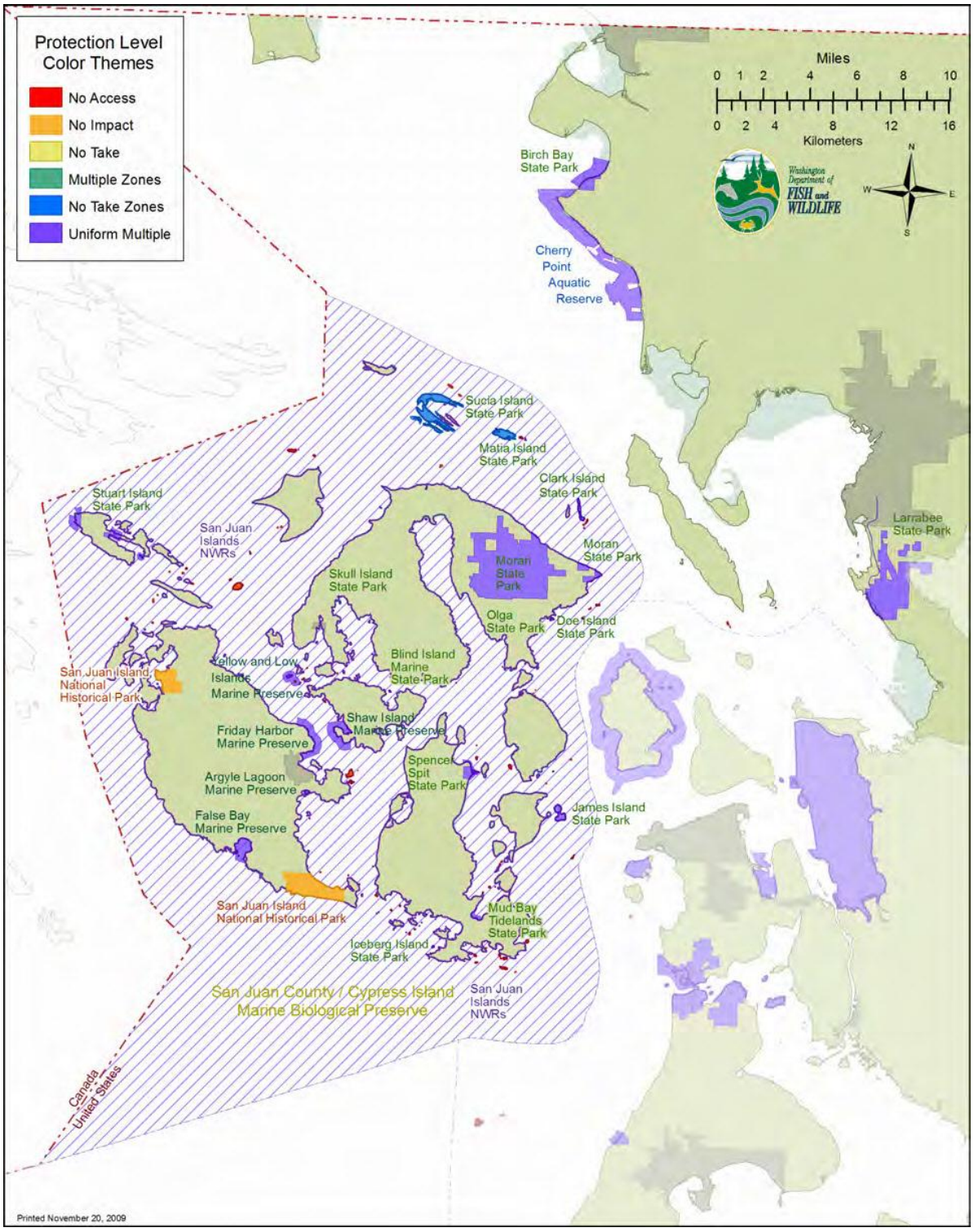

Figure 11. MPAs by protection level in the San Juan – Whatcom Action Area.

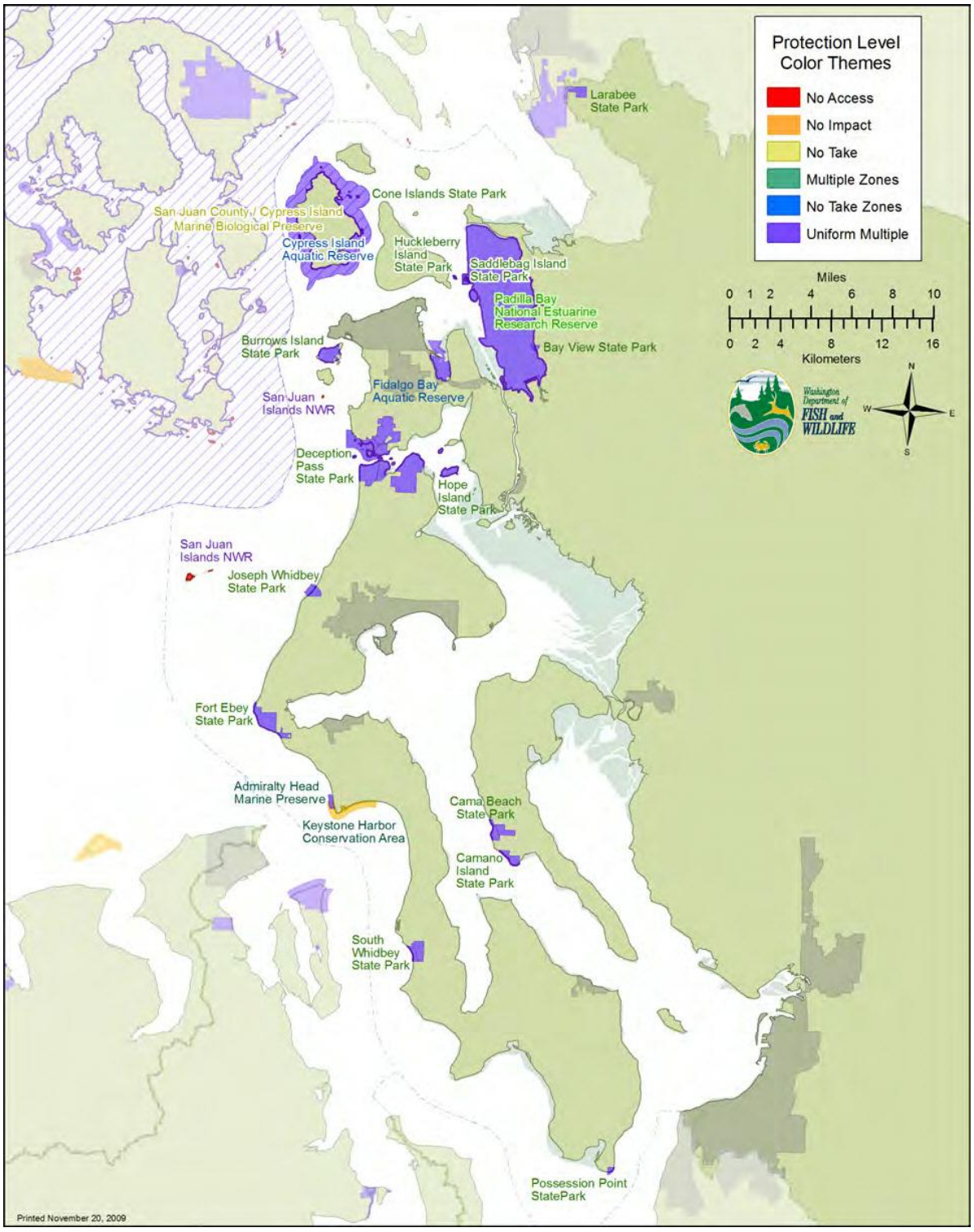

Figure 12. MPAs by protection level in the Whidbey Action Area.

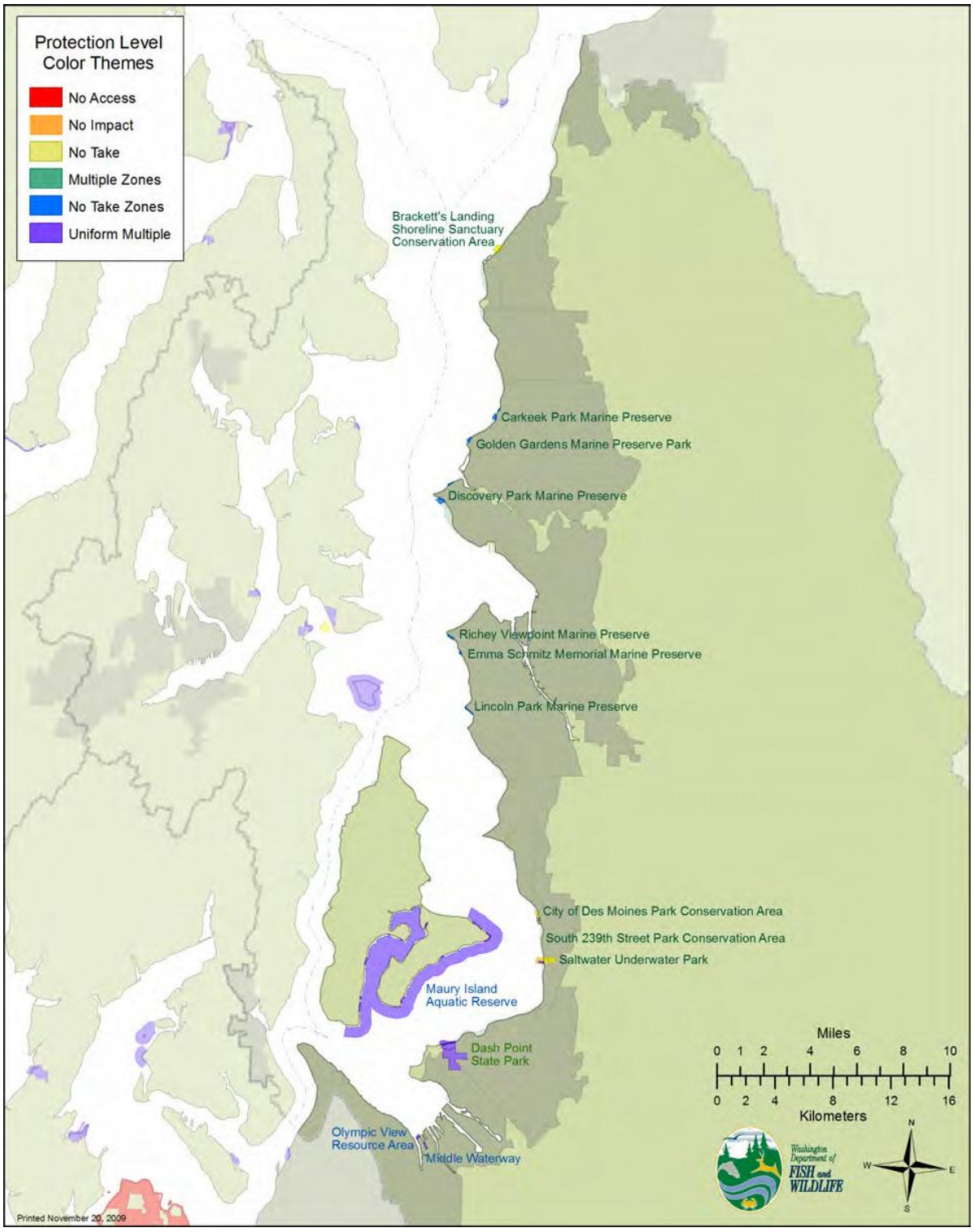

Figure 13. MPAs by protection level in the South Central Puget Sound Action Area.

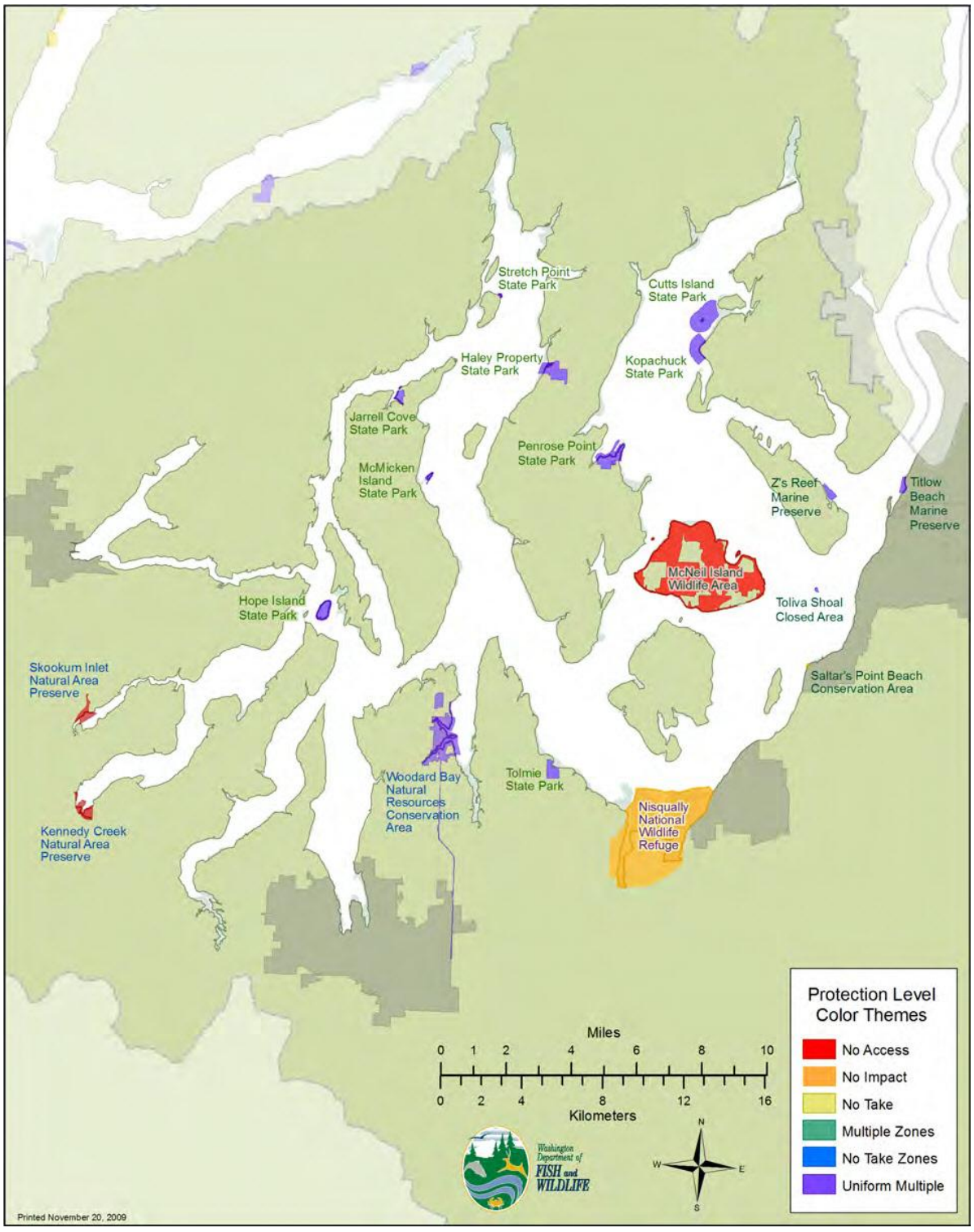

Figure 14. MPAs by protection level in the South Puget Sound Action Area.

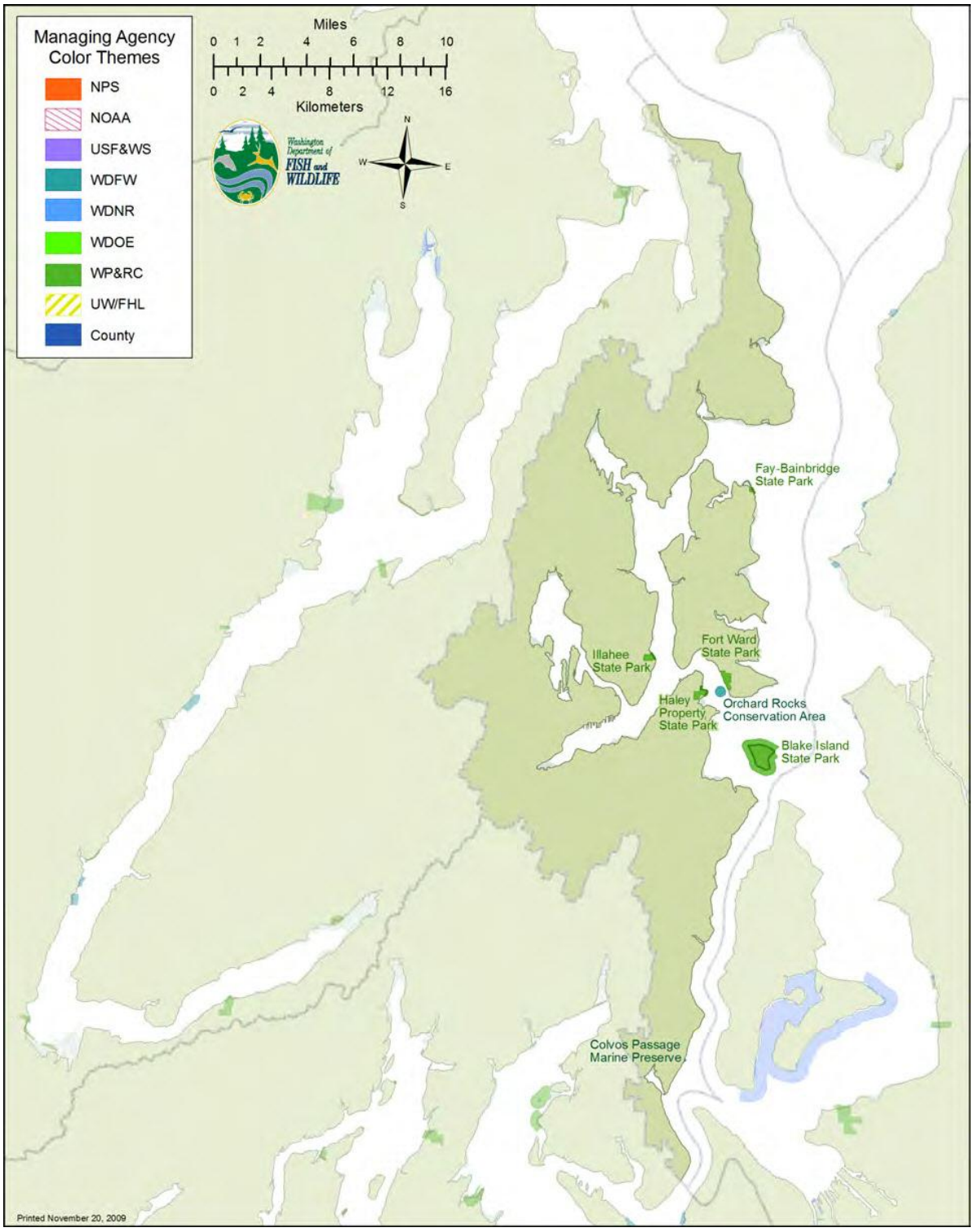

Figure 15. MPAs by protection level in the North Central Puget Sound Action Area.

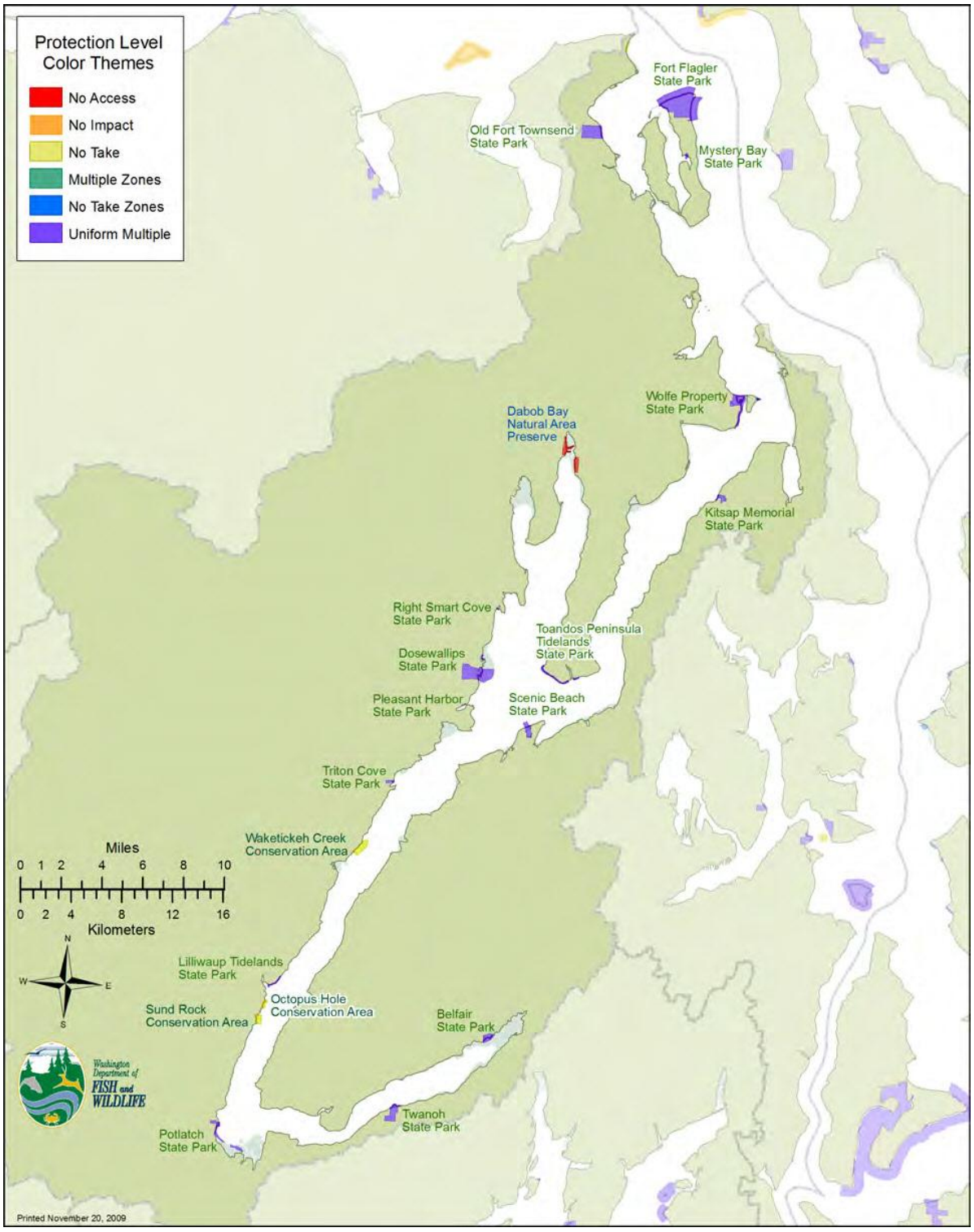

Figure 16. MPAs by protection level in the Hood Canal Action Area.

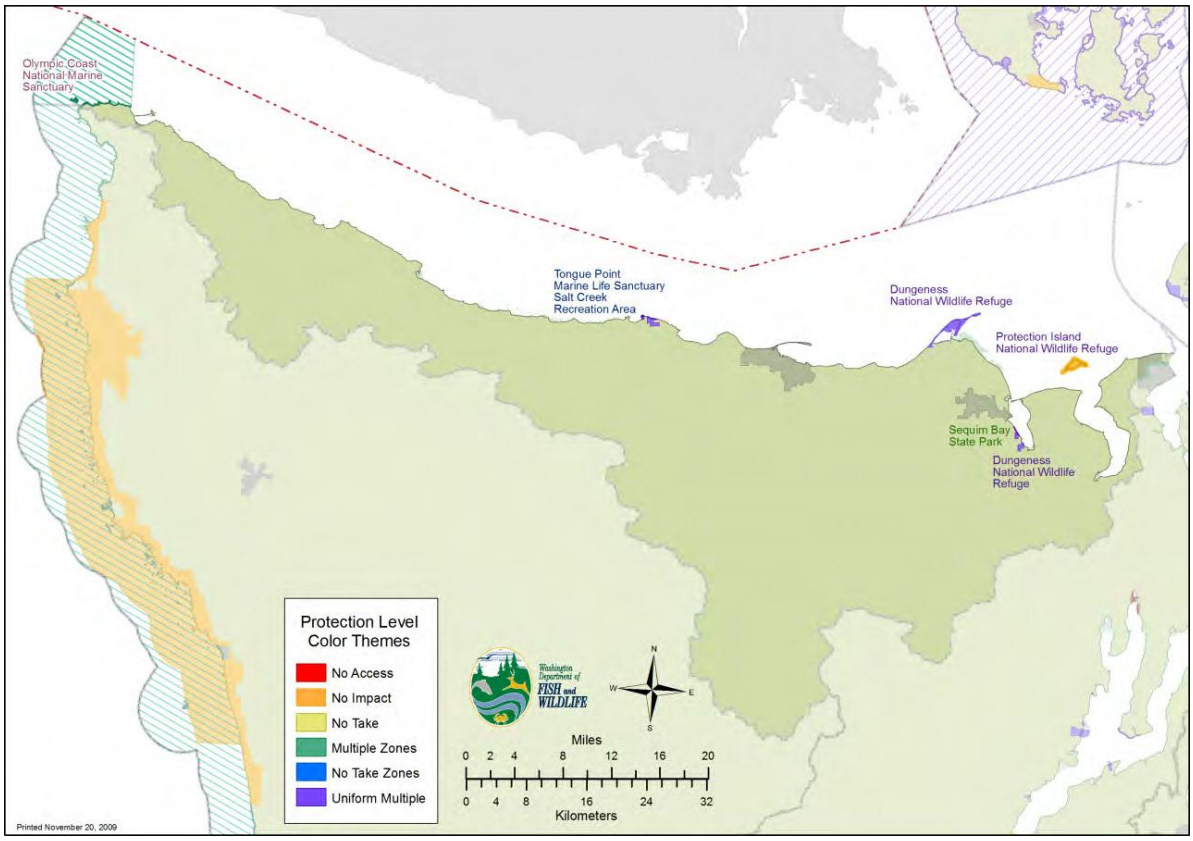

Figure 17. MPAs by protection level in the Strait of Juan de Fuca Action Area.

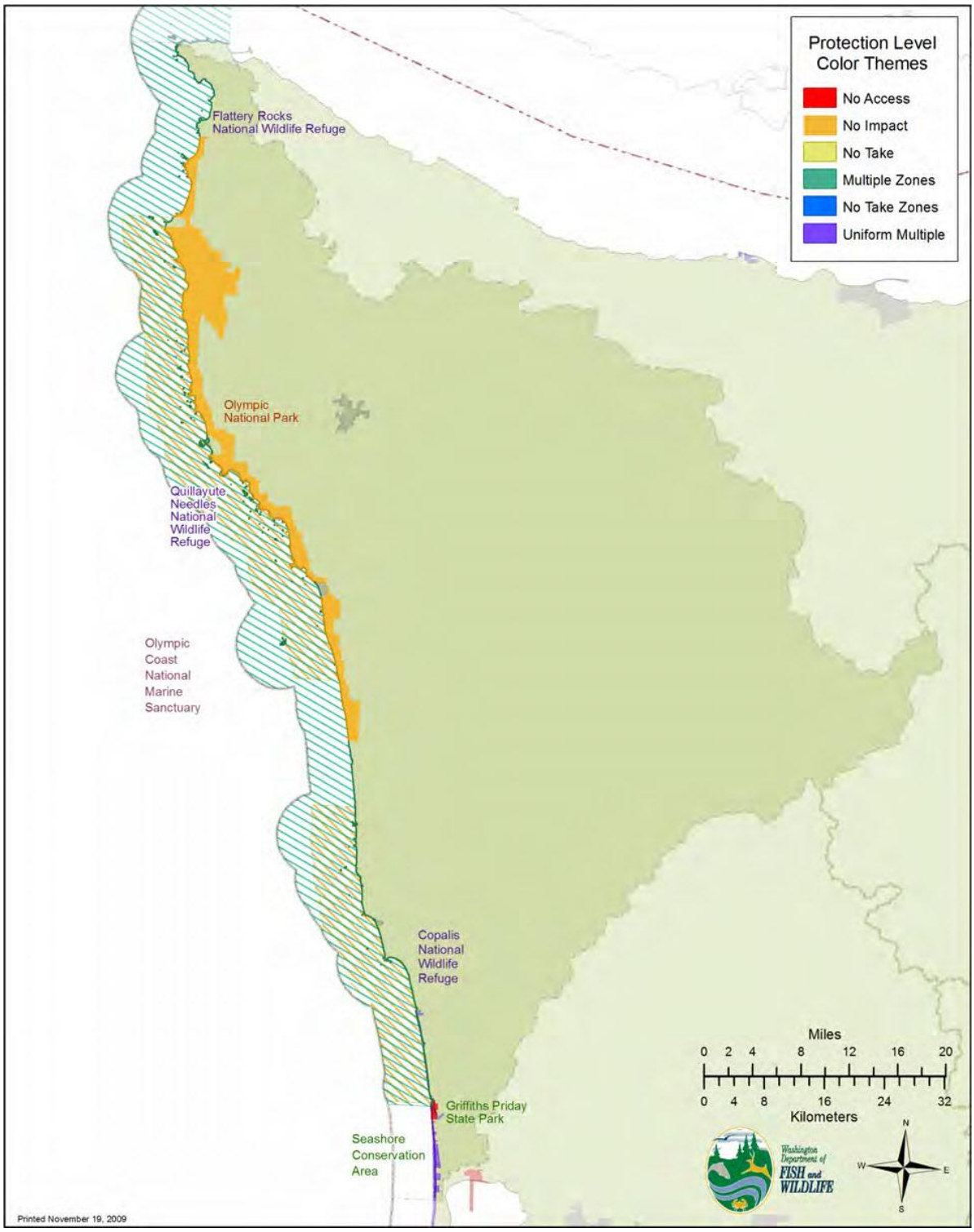

Figure 18. MPAs by protection level in the North Coast area.

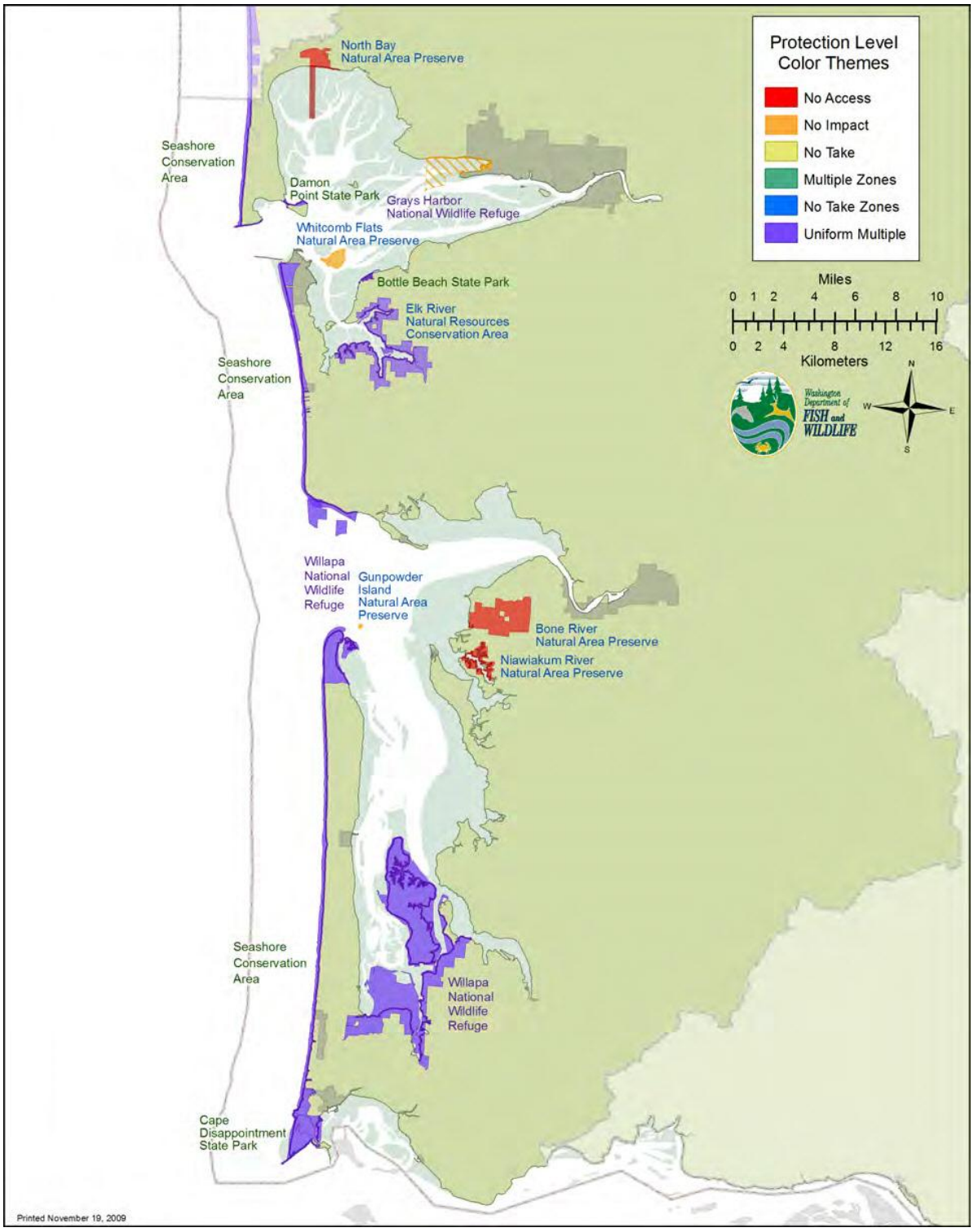

Figure 19. MPAs by protection level in the South Coast area.

Agencies Involved with Creation and Management of MPAs[10]

Washington Department of Natural Resources (WDNR)

WDNR regulates the harvest of geoduck clams and seaweed. DNR manages publically-owned intertidal and subtidal habitat. Terms used by DNR for its MPAs are:

Natural Area Preserves (NAPs) **NAPs** protect the best remaining examples of many ecological communities including rare plant and animal habitat. The Heritage program has identified the highest quality, most ecologically important sites for protection as natural area preserves. The resulting network of preserves represents a legacy for future generations and helps ensure that blueprints of the state's natural ecosystems are protected forever.

Aquatic Reserve The Aquatic Reserves Program is part of DNR's efforts to promote preservation, restoration, and enhancement of state-owned aquatic lands – sites that benefit the health of native aquatic habitat and species in the state.

DNR establishes state Aquatic Reserves to protect important native ecosystems on state-owned aquatic lands throughout the state. These are aquatic lands of special educational or scientific interest, or lands of special environmental importance. By examining past successes in site-based conservation, DNR helps ensure that aquatic reserve status is applied when it is the most consistent with goals for the type of reserve established (ecological, scientific, or educational), described in a site-specific management plan, as guided by the Aquatic Reserve Non-Project Final Environmental Impact Statement and the Aquatic Reserves Program Implementation and Design Guidance.

Natural Resource Conservation Area (NRCAs) NRCAs allow low impact uses that do not negatively affect special features of the sites. This may include hiking and other uses, and is determined on a site by site basis with input from the surrounding community as management plans are developed. Management plans are developed for each natural area to guide action necessary for the protection of natural features. Scientists and staff conduct ecological monitoring to track changes in natural features and evaluate the effectiveness of management activities. Periodic site visits by staff and volunteer stewards ensure protection of sensitive features on preserves. In general, NAPs are managed to allow natural processes to occur as much as possible with minimal human intervention.

Site management plans for NRCAs are prepared based on guidelines outlined in the 1992 NRCA Statewide Management Plan. Plans address protection, enhancement, and restoration of resources, as well as low impact public uses. Significant resources at each site are identified and evaluated prior to identifying potential areas for low impact public use. Public involvement is key in management plan development.

[10] Adopted from web page of appropriate agency.

National Oceanic and Atmospheric Administration (NOAA)

NOAA has limited management authority over marine resources in state waters relating mostly to the specific statutory authorities of the Sanctuary Program, endangered species, marine mammals, and authority on intertidal land which it manages. Terms used by NOAA for its MPA categories are:

The National Estuarine Research Reserve System A network of protected area established for long-term research, education and stewardship. This partnership program between NOAA and the coastal states protects more than one million acres of estuarine land and water, which provides essential habitat for wildlife; offers educational opportunities for students, teachers and the public; and serves as living laboratories for scientists.

Marine Sanctuaries The primary objective of a sanctuary is to protect its natural and cultural features while allowing people to use and enjoy the ocean in a sustainable way. Sanctuary waters provide a secure habitat for species close to extinction and protect historically significant shipwrecks and artifacts. Sanctuaries serve as natural classrooms and laboratories for schoolchildren and researchers alike to promote understanding and stewardship of our oceans. They often are cherished recreational spots for sport fishing and diving and support commercial industries such as tourism, fishing and kelp harvesting. Olympic Coast National Marine Sanctuary is one of our nation's most treasured marine areas. The mission they've been given is to protect this area and ensure that future generations are able to use and enjoy it too. That means that we manage the sanctuary to both conserve its resources and encourage uses that are compatible with conservation.

Washington Parks and Recreation Commission (WPRC)

WPRC manages state parks for conservation and public use. All state parks with marine shoreline have some level of extra resource protection. Most state parks prohibit the removal of seaweed and all state parks prohibit the removal of unclassified marine invertebrates, such as starfish and shore crabs.

U.S. Fish and Wildlife Service (USFWS)

Wildlife Refuge The National Wildlife Refuge system is a network of habitats that benefit wildlife, provide unparalleled outdoor experiences for all Americans and protect a healthy environment. The Refuge System maintains the biological integrity, diversity and environmental health of these natural resources for the benefit of present and future generations of Americans.

Washington Department of Fish and Wildlife (WDFW)

WDFW manages the fish, shellfish, their habitats, and other marine life. WDFW established state-managed recreational and commercial fisheries and determine the time, place and manner that harvest is allowed. WDFW manages small sections of intertidal habitat for resource protection and public use. Terms used by WDFW for MPAs include:

Conservation Area A marine area where all harvest is closed.

Marine Preserve A marine area where harvest of most species is closed.

Wildlife Area An area to preserve habitat and species diversity for both fish and wildlife resources, maintain healthy populations of game and non-game species, protect and restore native plant communities and provide diverse opportunities for the public to encounter, utilize and appreciate wildlife and wild areas.

Washington Department of Ecology (WDOE)

The Department of Ecology cooperatively manages the Padilla Bay National Estuarine Reserve with the National Oceanic and Atmospheric Administration, a federal agency. The WDOE's Shorelands and Environmental Assistance Program helps communities manage shorelands and wetlands.

Literature Utilized

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APPENDIX 2: TRIBAL POLICY STATEMENT

TRIBAL POLICY STATEMENT
MARINE PROTECTED AREAS, MARINE RESERVES,
MARINE SANCTUARIES, and FISHERY CONSERVATION ZONES
JUNE 26, 2003

Introduction and Purpose

It is important for tribes to be involved in all federal state or local planning for marine protected areas, not only at the inception, but also at every stage thereafter. This is because the tribes have an integral role to play in resource management, legally, culturally, and economically. The Tribes have used and protected the region's marine resources for thousands of years and continue to be leaders in fisheries management today. Western Washington Indian tribes have treaty-reserved fishing rights in the marine waters within Puget Sound and off the Washington Coast. Tribal governments have exclusive management authority and responsibility for marine resources on their reservations. Through a number of intergovernmental forums, they participate in decisions regarding harvestable numbers and the potential need for conservation in certain fisheries. This is because tribal governments share co-management authority and responsibility for marine resources in their usual and accustomed fishing areas with State of Washington and/or the federal government depending on the specific resource and area identified. For this reason, it is essential that both conservation goals and standards for marine resource management are established through government-to-government consultations between the co-managers and with other state and/or federal agencies as appropriate. The regulation of tribal activities under a MPA is only appropriate if it is a reasonable and necessary conservation measure, does not discriminate against a tribe's reserved right to harvest resources, regulation of non-tribal activities alone will not meet the conservation needs and the tribe's own conservation measures are insufficient to meet the conservation needs. When proven necessary, in accordance with *United States* v. *State of Washington,* 384 F. Supp. 312 (W.D. Wash---1974), tribal governments will adopt conservation regulations that regulate their own member's fishing activities.

Marine protected areas, marine reserves, marine sanctuaries, and fishery conservation zones (time and area closures), may have many names and varied purposes, but in this policy, we will refer to them collectively as MPAs. Any relevant government agency or regulatory body may propose MPAs in the tribes' Usual and Accustomed fishing areas (U & As), but they cannot and must not be implemented without first, initiating and second, continuing consultation with the affected tribes. When a MPA is established in an off-reservation U&A, tribal governments have the right to regulate tribal activities consistent with the goals of the MPA. Tribal co-management of MPAs should be considered where it is appropriate and desired and include tribal regulation of tribal activities and enforcement authority within U & As. This makes it essential that any proponent contact each tribe whose U & As would be affected by the proposed MPA.

This is necessary because any proposal that restricts a tribe's access to a marine resource is a diminishment of its treaty right and cannot be imposed without its consent.

Policy Statement

The Tribes have lived in the Northwest since time immemorial and have co-evolved with this region's marine resources. Our presence and use of marine resources are part of the natural ecosystem and ecosystem processes. We support and insist that the marine resources of the Northwest, on which we depend for sustaining our culture, communities, and livelihoods, be managed and sustained for future generations.

Because of the impact that conservation measures can have on tribal economics, culture, and subsistence; the creation of MPAs should not be the "goal" in the absence of a demonstrated need for conservation. In the face of such demonstrated need, MPAs may be useful tools to sustain and/or conserve specific marine resources. However, MPAs are only one of the many possible management tools or alternatives that might effectively be used to sustain and conserve marine resources. MPAs must not be used as a substitute for sound, sustainable management of marine resources, or, the restoration of marine or freshwater habitats and water quality throughout Puget Sound and the Washington Coast. Nor should MPAs be used to disguise the allocation of marine resources.

The first step in defining which management measures are necessary to conserve a specific marine resource is to define the problem that needs to be addressed. The next step is to determine the scientific methods for resolution. Then, alternative management actions, including MPAs, need to be evaluated with regard to their effectiveness at addressing the problem identified. Proposals need to list problems, potential solutions, and the long-term vision for the specific marine resource(s). In evaluating any management alternative to address a defined problem, ancillary benefits that may be derived from application of the measure should be considered.

We will work with the appropriate state and federal agencies to maintain a leadership role in the evaluation and application of MPAs as management tools. To the extent these actions are necessary to address a resource problem, the Tribes must be involved in the decision and will be responsible for regulating activities by tribal members. In the end, these management actions must acknowledge treaty rights and accommodate the traditional relationship that the Tribes have had with marine resources.

General assessment framework

Any proposed MPA, whether for habitat or harvest protection, must be evaluated for consistency with the goals and objectives of the existing management plans for the specific marine resource (population, species, species assemblage, or marine community). These proposed regulations must be evaluated by the affected and applicable co-managers in context with all the other management tools available to achieve resource objectives and must demonstrate unequivocally to the tribes that the MPA is a necessary conservation measure. Because any proposed action that restricts harvest or access would be a diminishment of the tribes' treaty rights, a proposed MPA must be evaluated in the context of all other regulatory alternatives that might achieve the same conservation principle without diminishing any Tribe's treaty rights.

Any MPA proposal should address at least the following elements:

What is the threat, problem, or situation that is triggering the proposal for a MPA? (The scope of any proposed action must be appropriate to the defined problem.) Describe the affected resource/species.

What is the current status of the resource and what is the desired future status (goals and objectives) that will result from the proposed management action? Over what period of time is the resource expected to move from the current status to the desired future status?

What are the specific goals and objectives identified for the proposed affected area (including the anticipated time periods over which the goals and objectives will be achieved)?

Is the scientific information sufficient to determine need and an appropriate response? If not, what research is needed to complete the picture before a decision is made regarding the resource? And as corollaries: what funding is necessary to perform this research? Who should undertake it? Who are the appropriate partners?

Which marine resource(s) is targeted by the research or recovery proposal? As corollaries: What are the identified factors for decline? How does the proposal address the identified factors for decline? Will it lead to means for recovery? Will it be on-the-ground gathering of empirical evidence or will it be use of models?

How does this proposal fit in with harvest management plans and habitat management plans (for upland, nearshore, and deepwater areas) related to the targeted resource?

What other alternatives, voluntary or regulatory, will achieve the same goals and objectives (identified in response to question no. 2 above) with less impact on Tribe's exercising their treaty rights?

How will progress be monitored and "success" be measured? Who will conduct these monitoring and evaluation activities?

How will adaptive management be utilized to modify the goals and objectives of The MPA?

Who are the parties that make the decisions? On what basis?

APPENDIX 3: SUMMARY OF MANAGEMENT PRACTICES

Each MPA manager representing an agency presented a brief outline of current management practices at Washington State MPAs to the MPA Work Group in order to develop a common understanding of practices, challenges, and opportunities for improvement. Speakers were asked to describe the primary management objective, obstacles to achieving that objective, the area-based protection authority, establishment process, adjacent land protection if any, the permanence of protection, and enforcement presence at the site(s).

National Park Service, Olympic National Park

Management objective - *What is the primary management objective for the site? (a) provide recreational opportunities, (b) conservation of one or more species, (c) protection of habitat, (d) education or research, (e) other*

Dual objective, namely to preserve unimpaired for the enjoyment of future generations. Thus, objectives A, B and C above are all the co-primary objectives of the park. The park is mandated to preserve all habitats and the species inhabiting them.

On a scale of 1 to 5 with 1 representing little to no management success and 5 representing measurable outcomes with positive results, what is the level of management success at each site?

With relatively few current impacts to the Olympic outer coast, we would rate the current management success as a 5, with no measureable impairment of resources.

How can management be improved at the site? What are the obstacles to achieving the primary objectives listed above?

Park coastal management can be improved through the implementation of marine reserves as called for in our most recent General Management Plan (2009). These marine reserves would prohibit harvest in selected sensitive and/or important habitats within the park's intertidal zone.

Authority - *What authorities and tools are used to protect this area? (e.g., harvest restrictions, public access, ownership or control of use rights)*

Olympic National Park is a zone of exclusive federal jurisdiction. Laws and mandates used to manage the park include the NPS Organic Act (16 USC§1), the NPS General Authorities Act (16 US C§1a-1), the park enabling legislation (Act of June 29, 1938, 35 Stat. 2247), and the act that added the park's coastal strip (PL 99-635). Promulgation of fish and shellfish regulations, in addition to access controls (e.g. camping quotas) are used to protect the coastal zone. Additionally, approximately 75% of the coastal strip is in congressionally designated wilderness, which is afforded additional protections under the Wilderness Act.

Establishment *- How was the area established? Briefly describe the process.*

Olympic National Park was created by an act of Congress (Act of June 29, 1938, 35 Stat. 2247). The coastal strip, including the intertidal zone down to extreme low water was added in 1986 (PL 99-635).

Land protection *- Is there adjacent terrestrial protection? If there is adjacent terrestrial protection, are there marine-specific management goals?*

A terrestrial strip of park land approximately 1-3 miles wide borders the intertidal zone. One marine-specific management goal of this terrestrial coastal strip is to provide a buffer for the marine shoreline from coastal development or extractive land management practices.

Partners *- What partners are involved and for what purpose/actions?*

The Olympic Coast National Marine Sanctuary (OCNMS) is a partner in the management of the park's marine resources. The OCNMS and the park have an overlapping boundary in the intertidal zone.

Enforcement *- Is there an enforcement or management presence on-site?*

Olympic National Park has coastal rangers that patrol the park coastline and enforce National Park Service regulations. The park coastline is a long, remote area that creates challenges for a continuous enforcement presence throughout. However, permanent enforcement personnel are present on-site year-round, augmented by seasonal enforcement personnel for part of the year.

On a scale of 1 to 5 with 1 representing little to no enforcement, and 5 representing enforcement on site, what is the level of enforcement at each site?

We would rate the enforcement presence at 4.

Permanence *- What is the explicit or implicit duration of protection? Does protection require updating or periodic performance evaluation?*

The protection duration of Olympic National Park is for perpetuity. There is no expiration; however management plans are updated on a 10-15 year cycle.

On a scale of 1 to 5 with 1 representing little to no protection of resources, and 5 representing a prohibition of extraction of all resources, what is the level of protection at each site?

We would rate the level of protection of resources as 4. Few extractive activities are allowed, with the exception of fish and shellfish harvest. This harvest is more limited than comparable harvest on state beaches. Harvest season duration is similar, although fewer species are allowed to be harvested.

National Oceanic and Atmospheric Administration, Olympic Coast National Marine Sanctuary

Management objective *- What is the primary management objective for the site? (a) provide recreational opportunities, (b) conservation of one or more species, (c) protection of habitat, (d) education or research, (e) other*

Natural and cultural resource protection, however, the Sanctuary is a multiple use area where other uses are allowed to the extent that these other uses are sustainable and compatible with resource protection. Management goals include maintenance of biodiversity and ecosystem functions,

protection of marine habitats, collaborative management, improved understanding of sanctuary resources, and promotion of ocean literacy.

On a scale of 1 to 5 with 1 representing little to no management success and 5 representing measurable outcomes with positive results, what is the level of management success at each site?

This is difficult to quantify because we do not have established metrics. A subjective answer is: 3

How can management be improved at the site? What are the obstacles to achieving the primary objectives listed above?

Management can be improved by periodic evaluation of our programs and revision of our management plan to renew the strategies and actions we will undertake associated with defined management issues. OCNMS is currently revising its management plan. Increased regulatory authority is not recommended as a solution to improved effectiveness. Improvement will likely come through cooperative and collaborative efforts in research to better understand the ecosystem elements and functions, assessment to identify threats and impacts, public outreach programs, and working with other regulatory authorities to define appropriate management actions. Some threats to natural and cultural resources in the Sanctuary are external and global in nature, e.g., climate change and associated marine issues such as ocean acidification and changes to large-scale ocean circulatory patters that influence productivity, hypoxia, and other ecosystem-level controlling factors. Another factor in Sanctuary management is multiple jurisdictions and authorities with differing objectives. For example, fishing not restricted by OCNMS but is managed by other federal and state authorities with goals of sustainable fisheries targeted at maximum sustainable yield. Also, most military activities are exempted from OCNMS regulations, except bombing exercises which are prohibited in the Sanctuary.

Authority *- What authorities and tools are used to protect this area? (e.g., harvest restrictions, public access, ownership or control of use rights)*

OCNMS has regulations that prohibit 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; 3) moving, removing or injuring, or attempting to move, remove or injure, a Sanctuary historical resource; 4) drilling into, dredging or otherwise altering the seabed of the Sanctuary; 5) taking any marine mammal, sea turtle or seabird in or above the Sanctuary; 6) flying motorized aircraft at less than 2,000 feet both above the Sanctuary within one NM of the Flattery Rocks, Quillayute Needles, or Copalis National Wildlife Refuge, or within one NM seaward from the coastal boundary of the Sanctuary; 7) possessing within the Sanctuary (regardless of where taken, moved or removed from) any historical resource, or any marine mammal, sea turtle, or seabird taken in violation of the MMPA, ESA or MBTA; 8) 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; and 9) the Department of Defense is prohibited from conducting bombing activities within the Sanctuary. OCNMS has a permit application and review process for anyone pursuing an activity that might intersect with these prohibitions. OCNMS also relies on collaborative management to protect marine resources. OCNMS does not have authority for fisheries/harvest management, nor does it

restrict public access. Such restrictions exist in various places throughout the sanctuary, under other authorities (i.e., NOAA Fisheries, USFWS, ONP).

Establishment *- How was the area established? Briefly describe the process.*

Sanctuaries are established under National Marine Sanctuaries Act, through the Department of Commerce/National Oceanic and Atmospheric Administration. Candidate sites undergo a formal process for site evaluation, with selection based on natural and cultural features, ecosystem productivity, and condition relative to pre-industrial development. OCNMS was designated in 1994.

Land protection *- Is there adjacent terrestrial protection? If there is adjacent terrestrial protection, are there marine-specific management goals?*

OCNMS has no terrestrial protections except jurisdiction of intertidal areas on federal lands (i.e., Olympic National Park). OCNMS jurisdiction does not cover intertidal areas of Native American reservations or the Washington Seashore Conservation Area. Washington Islands National Wildlife Refuge Complex offers protection to uplands on about 600 islands and rocks where access and resource use is prohibited. Olympic National Park jurisdiction covers intertidal areas on refuge islands and the coastal strip of the park. The Washington Seashore Conservation Area covers the shoreline and intertidal areas south of Quinault Reservation. Sanctuary jurisdictions in marine waters extends south of the Quinault Reservation to the Copalis River.

Partners *- What partners are involved and for what purpose/actions?*

With relatively limited budget and staff, OCNMS is focused on collaboration and partnerships. Significant partners include Olympic National Park, USFWS, Washington state, and Native American tribes on outreach/education, research, management initiatives.

Enforcement *- Is there an enforcement or management presence on-site?*

OCNMS relies on the NOAA Office of Law Enforcement for enforcement. They also have an agreement with the USCG and Washington Department of Fish and Wildlife for enforcement support. OCNMS staff presence on the coast and in the Sanctuary is occasional.

On a scale of 1 to 5 with 1 representing little to no enforcement, and 5 representing enforcement on site, what is the level of enforcement at each site?

No answer provided

Permanence *- What is the explicit or implicit duration of protection? Does protection require updating or periodic performance evaluation?*

Permanent and periodically reviewed/modified through management plan review.

On a scale of 1 to 5 with 1 representing little to no protection of resources, and 5 representing a prohibition of extraction of all resources, what is the level of protection at each site?

4 – the primary extractive activity in the Sanctuary is fishing.

U.S. Fish and Wildlife Service, Washington Maritime National Wildlife Refuge Complex

Management objective *- What is the primary management objective for the site? (a) provide recreational opportunities, (b) conservation of one or more species, (c) protection of habitat, (d) education or research, (e) other*

Flattery Rocks National Wildlife Refuge (NWR), Quillayute Needles NWR and Copalis NWR (Washington Islands National Wildlife Refuges), make up the Coastal refuges. The primary management objective of the coastal refuges is to provide undisturbed breeding and resting habitat for migratory birds (seabirds) and marine mammals. Dungeness NWR discussion is focused on the tidelands of the second class (MPA). Primary management objective is protection of wildlife species and eel grass. Public use is restricted with the area being open to boating and shell fishing from May 15 to September 30 each year. Establishment of Protection Island NWR was authorized by the Protection Island National Wildlife Refuge Act, Public Law 97 – 333, Oct 15, 1982 (96 Stat. 1623). "The purposes of the refuge are to provide habitat for a broad diversity of bird species, with particular emphasis on protecting the nesting habitat of the bald eagle, tufted puffin, rhinoceros auklet, pigeon guillemot, and pelagic cormorant; to protect the hauling-out area of harbor seals; and to provide for scientific research and wildlife-oriented public education and interpretation (96 Stat. 1623)." San Juan Islands NWR primary goal is "...as a preserve and breeding ground and winter sanctuary for native birds."Matia Island was added in 1937 "...as a refuge and breeding ground for migratory birds and other wildlife." Also in 1976 all the islands within the refuge except for Smith, Minor Turn and part of Matia Island were designated Wilderness.

On a scale of 1 to 5 with 1 representing little to no management success and 5 representing measurable outcomes with positive results, what is the level of management success at each site?

Level of management success for coastal refuges and Dungeness refuge is rated at #5. For San Juan refuges, success is 3

How can management be improved at the site? What are the obstacles to achieving the primary objectives listed above?

For the San Juan refuges, management is hampered by lack of management authority for the inter and sub-tidal areas around the islands. We request that the boating public remain 200 yards off the islands where possible to prevent disturbance but this is voluntary.

Authority *- What authorities and tools are used to protect this area? (e.g., harvest restrictions, public access, ownership or control of use rights)*

Authorities to manage the coastal refuges including the above mentioned EO and Public laws include; National Wildlife Refuge System Improvement Act of 1997, Refuge Recreation Act of 1962, Endangered Species Act of 1973 as amended, The Bald and Golden Eagle Protection Act of 1940, Migratory Bird Treaty Act of 1918, as amended, and Marine Mammal Protection Act of 1972 as amended. For Dungeness, Code of Federal Regulations Title 50 and all of the authorities mentioned for the coastal refuges except for the Wilderness Act are used to protect this area. For Protection Island, the Service also has a 20-year, aquatic lands lease for the second class tidelands around Protection Island (No 20-013245) from Washington Department of Natural Resources (WDNR). This lease is authorized by the Fish and Wildlife Act of 1956, ". . . for the development, advancement, management, conservation, and protection of fish and wildlife resources . . ." (16 U.S.C.742f(a)(4)). The 340-acre tideland lease is due to expire on December 31, 2013. The tideland lease is overlaid on a WDNR reservation and withdrawal "from conflicting uses for an indefinite term from November 22, 1988" of " . . . .the bedlands of navigable water owned by the state of Washington, surrounding Protection Island extending waterward 600 feet from the line of extreme low water (WDNR 1988, Withdrawal Order 88 017)". This withdrawal order further states that public access may be permitted under conditions mutually agreed upon by the DNR and USDI. This is the authority for the refuge to manage the tidelands of Protection Island. We request boaters to stay 200 yards off the island to prevent disturbance. For the San Juan refuges, all the islands except for Turn and Matia are closed to the public. We request that the boating public remain 200 yards off the islands where possible to prevent disturbance but this is voluntary. Other Authorities to manage the area are the same as mentioned previously.

Establishment *- How was the area established? Briefly describe the process.*

Flattery Rocks National Wildlife Refuge (NWR), Quillayute Needles NWR and Copalis NWR (Washington Islands National Wildlife Refuges). These three refuges were established by Executive Order on October 23, 1907 "...are hereby reserved and set aside for the use of the Department of Agriculture, as a preserve and breeding ground for native birds and animals." In addition all the islands except for Destruction Island were designated as wilderness by Public Law 91-504 on October 23, 1970 to be managed in accordance with the provisions of the Wilderness Act of 1964 (PL 88-577). Dungeness NWR was established by Executive Order 2123 on January 20, 1915 for the purpose of"...a refuge, preserve, and breeding ground for native birds..." On May 29, 1943, the State of Washington granted a Use Deed (Deed No. 18251) to the Fish and Wildlife Service for all of the second class tidelands associated with Dungeness NWR to be managed as part of Dungeness NWR, additional upland areas were added to the refuge in 1971, 1972, 1996 and 1999. The following discussion will deal with the tidelands of the second class (MPA). San Juan Islands NWR establishment began with Executive Order 1959, June 6, 1914 establishing Smith Island and Minor Island NWR "...as a preserve and breeding ground and winter sanctuary for native birds."Matia Island was added in 1937 "...as a refuge and breeding ground for migratory birds and other wildlife." Additional islands were added 1960, 1961, 1967, 1970, and 1976. Also in 1976 all the islands within the refuge except for Smith, Minor Turn and part of Matia Island were designated Wilderness.

Land protection *- Is there adjacent terrestrial protection? If there is adjacent terrestrial protection, are there marine-specific management goals?*

Terrestrial protection is part of all of the uplands within these three coastal refuges. For Dungeness, there is adjacent upland protected as National Wildlife Refuge with marine specific goals of protecting eel grass and water quality. For Protection Island, adjacent uplands protected as National Wildlife Refuge and WDFW's Zella M. Shultz Seabird Sanctuary with marine specific management goals of providing disturbance free feeding and resting areas for seabirds and marine mammals.

Partners *- What partners are involved and for what purpose/actions?*

Partners for coastal refuges include: Washington Dept. of Fish and Wildlife; the Makah, Quileute, Hoh, and Quinault Tribes; National Park Service (Olympic Nat'l Park); NOAA (Olympic Coast Nat'l Marine Sanctuary); and Washington Dept. of Natural Resources. For Dungeness, partners include WDFW, Jamestown S'Klallam Tribe, WDNR. For Protection Island, Partners include WDFW, WDNR, and Point No Point Treaty Tribes. For the San Juan refuges, Partners include WDFW, NPS, BLM, San Juan County MRC, Sound Watch and WDNR. We are currently working with WDNR on potential tideland leases.

Enforcement *- Is there an enforcement or management presence on-site?*

There is little enforcement or management presence on coastal refuge sites. Enforcement is covered by Code of Federal Regulations Title 50. We request boaters to stay 200 yards off the islands to prevent disturbance but this is voluntary. For Dungeness, enforcement is on site most of the time either from the Refuge Law Enforcement Officer or resident volunteer caretaker. For the San Juan refuges, we do not have an enforcement presence on site.

On a scale of 1 to 5 with 1 representing little to no enforcement, and 5 representing enforcement on site, what is the level of enforcement at each site?

Coastal refuge enforcement ranks at #1. Protection of the upland is of perpetual duration and would be level #5. For Dungeness, enforcement rates 5.

Permanence *- What is the explicit or implicit duration of protection? Does protection require updating or periodic performance evaluation?*

Forever for all

On a scale of 1 to 5 with 1 representing little to no protection of resources, and 5 representing a prohibition of extraction of all resources, what is the level of protection at each site?

No answer provided

University of Washington, Friday Harbor Labs, San Juan County/Cypress Island Marine Biological Preserve

Management objective *- What is the primary management objective for the site? (a) provide recreational opportunities, (b) conservation of one or more species, (c) protection of habitat, (d) education or research, (e) other*

Primary objectives are research and education, conservation of species (bottomfish, invertebrates, marine plants), and habitat protection (all intertidal and subtidal habitats)

On a scale of 1 to 5 with 1 representing little to no management success and 5 representing measurable outcomes with positive results, what is the level of management success at each site?

The MBP would rate a 4.

How can management be improved at the site? What are the obstacles to achieving the primary objectives listed above?

Management is successful in that requests for collecting are adequately addressed, and we are not aware of any large amount of collecting outside these permissions (or those of WDFW). However, there is no enforcement of events or quotas, and thus "measurable outcomes" are difficult. FHL now keeps records of all collecting reported to the director. Management could be improved by additional public dissemination of the need for collectors of any type (schools, aquariums, individuals) to obtain permission and to report amounts collected once permission is granted. Additional patrol and enforcement personnel for WDFW would also improve management of the MBP.

Authority *- What authorities and tools are used to protect this area? (e.g., harvest restrictions, public access, ownership or control of use rights)*

Harvest restrictions are set by FHL, on a case-by-case basis, with attention paid to the known abundance or rarity of local species.

Establishment *- How was the area established? Briefly describe the process.*

The waters of San Juan County and Cypress Island were designated a Marine Biological Preserve (MBP) in 1923 (Chap. 74, House Bill 68, R.C.W.28.77.230, 1969 Revision R.C.W.28B.20.320), specifically for "marine biological materials useful for scientific purposes, except when gathered for human food, and except, also, the plant Nereocystis…." , with permission for collecting to be "… first granted by the director of the Friday Harbor Laboratories of the University of Washington." This Marine Biological Preserve designation is still in effect and scientific collecting of non-food species has been approved annually by the director of FHL since 1923. In 2006, the San Juan Board of County Commissioners (now County Council) designated the waters of the entire County a Marine Stewardship Area (MSA) with the stated objective: "to facilitate the protection and preservation of our natural marine environment for the tribes and other historic users, current and future residents, and visitors". The SJC MSA is thus similar in extent to the original MBP of 1923, minus Cypress Island.

Land protection *- Is there adjacent terrestrial protection? If there is adjacent terrestrial protection, are there marine-specific management goals?*

There is adjacent terrestrial protection for several of the WDFW/UW Marine Preserves, including over 470 acres of terrestrial biological preserve (UW land) between Friday Harbor and Pt. Caution on SJI, and another several acres on Shaw Island adjacent to the Marine Preserve at Pt. George (UW land). There are 23 acres of terrestrial preserve inland of False Bay, SJI (UW land), and another 1.6 acres next to Argyle Lagoon on SJI. The Yellow and Low Is. Preserves have adjacent terrestrial preserves owned by the Nature Conservancy, and there are many other examples of state, federal and private lands bordering the entire MBP of San Juan County and Cypress Island.

Partners *- What partners are involved and for what purpose/actions?*

Within the MBP, there are also designated Marine Preserves (MPAs) (est. 1990) managed jointly by WDFW and the University of Washington Friday Harbor Laboratories, in which bottom fishing and harvesting of benthos is not allowed (Pt. Caution, SJI, Pt. George, Shaw Is., False Bay, Argyle Lagoon; only trolling for salmon is allowed) or where no type of fishing is allowed (Yellow and Low Islands). The Nature Conservancy is a partner in the Yellow and Low Island Preserve. The San Juan County MRC also established a network of eight voluntary Bottomfish Recovery Areas (no-take zones) in 1996; these areas are of very limited extent compared to the mandatory WDFW preserves. The Seadoc Society is a partner in studying the effectiveness of the preserves. Cypress Island was also designated an Aquatic Reserve, managed by DNR and Skagit County, in 2008 and is also within the MBP.

Enforcement *- Is there an enforcement or management presence on-site?*

There is a full-time caretaker, and resident director, on the property at the (Friday Harbor Pt. Caution/FHL) preserve on San Juan Island, and very regular FHL boat traffic along this shore. FHL personnel frequently inform boaters of the preserve restrictions and boundaries. There is also a full-time caretaker on the Shaw Island property who performs similar functions and the Nature Conservancy has a full-time resident caretaker on Yellow Island. There is not regular patrolling of the Argyle and False Bay properties. There is signage on all of the marine and terrestrial preserves managed by UW.

On a scale of 1 to 5 with 1 representing little to no enforcement, and 5 representing enforcement on site, what is the level of enforcement at each site?

No answer provided

Permanence *- What is the explicit or implicit duration of protection? Does protection require updating or periodic performance evaluation?*

The duration of protection is intended to be long-term, without a set or implied date of termination, for the MBP and the Marine Preserves. Monitoring of fish populations at two sites has been in place since the 1970s, and monitoring of benthic communities since 2006 at two sites. Monitoring of two intertidal sites within the MBP has been conducted by UW since 1984.

On a scale of 1 to 5 with 1 representing little to no protection of resources, and 5 representing a prohibition of extraction of all resources, what is the level of protection at each site?

The level of protection in the Marine Preserves (with WDFW) is 4.5. The greatest problem is incidental taking of bottomfish by salmon fishers, and some taking of bottomfish and crabs by fishers unaware or ignoring the preserve boundaries. The level of protection in the MBP (and MSA) is also 4.5 for non-food species, and is 3-4 for species regulated solely by WDFW, primarily because of the low level of patrolling and enforcement in the county.

Washington Department of Fish and Wildlife

Management objective *- What is the primary management objective for the site? (a) provide recreational opportunities, (b) conservation of one or more species, (c) protection of habitat, (d) education or research, (e) other*

DFW sites are created for research opportunities, recreation, conservation of rockfish and other reef oriented sedentary species, and to provide an area undisturbed by fishing. We also seek to use MPAs as a means to bolster fish populations (and fishing success) in areas adjacent to, but not included in an MPA.

On a scale of 1 to 5 with 1 representing little to no management success and 5 representing measurable outcomes with positive results, what is the level of management success at each site?

5 for recreation and research sites, 3 for stock rebuilding sites.

How can management be improved at the site? What are the obstacles to achieving the primary objectives listed above?

Better design and placement of MPAs.

Authority - *What authorities and tools are used to protect this area? (e.g., harvest restrictions, public access, ownership or control of use rights)*

Harvest restrictions

Establishment *- How was the area established? Briefly describe the process.*

Sites are established through establishment of rules authorized by statute. Most existing sites started with a suggestion from the public or another agency. The UW, various local governments (Seattle, Edmonds) recreational divers have been instrumental in suggesting sites. Some adjacent landowners (Sund Rock) have been instrumental in establishing new MPAs. The harvesting public, mainly recreational fishing groups, provide much information the final shaping of each MPA. Each shaping includes determination of size and boundaries and determination of which harvest activities will be allowed to continue within each MPA.

Land protection *- Is there adjacent terrestrial protection? If there is adjacent terrestrial protection, are there marine-specific management goals?*

Terrestrial protection may or may not be included. For most instances, the terrestrial protection is provided by one of our partner agencies such as the City of Seattle.

Partners *- What partners are involved and for what purpose/actions?*

University of Washington- establishing research sites
Seattle, Edmonds- to provide harvest protection which extends beyond the cities authority
Recreational Divers- establishing underwater parks for viewing aquatic life
Conservation organizations- to further protection of Puget Sound

Enforcement - *Is there an enforcement or management presence on-site?*

MPA rules are enforced with the same enforcement of other rules regarding commercial and recreational fishing in Puget Sound. However, there is great public support for MPA and peer pressure discourages illegal fishing and additionally increases the reporting of observed illegal fishing.

On a scale of 1 to 5 with 1 representing little to no enforcement, and 5 representing enforcement on site, what is the level of enforcement at each site?

Enforcement would rate 3.

Permanence - *What is the explicit or implicit duration of protection? Does protection require updating or periodic performance evaluation?*

We have no sunset clause on any of our MPAs.

On a scale of 1 to 5 with 1 representing little to no protection of resources, and 5 representing a prohibition of extraction of all resources, what is the level of protection at each site?

3 to 4.

Washington Department of Natural Resources

Management objective *- What is the primary management objective for the site? (a) provide recreational opportunities, (b) conservation of one or more species, (c) protection of habitat, (d) education or research, (e) other*

The primary management objectives for each reserve are different, but generally they are for the conservation of species and the protection of habitat, and education and research.

On a scale of 1 to 5 with 1 representing little to no management success and 5 representing measurable outcomes with positive results, what is the level of management success at each site?

I am not sure I can answer this question at this point. We have just begun implementing the management plans and don't really have any solid data yet. I guess you could say somewhere around 2.5 – we have management plans in place that identify conservation and implementation strategies, many of which are currently being implemented, we don't have the data to indicate how successful those implementation strategies are.

How can management be improved at the site? What are the obstacles to achieving the primary objectives listed above?

Management can be improved through increased funding, and management partnerships that will allow for more comprehensive conservation strategies to be implemented, and for more monitoring taking place.

***Authority** - What authorities and tools are used to protect this area? (e.g., harvest restrictions, public access, ownership or control of use rights)*

Control of use rights through proprietary management of state-owned aquatic lands. Outreach and Education, monitoring, restoration.

***Establishment** - How was the area established? Briefly describe the process.*

Existing Aquatic Reserves were originally established in a top down manner through the issuance of a commissioners withdraw order. After initial establishment extensive outreach was conducted for each reserve, and a scientific review by an outside technical committee was conducted. Finally management plans were developed and adopted.

***Land protection** - Is there adjacent terrestrial protection? If there is adjacent terrestrial protection, are there marine-specific management goals?*

There are different levels and amounts of adjacent terrestrial protection at the different reserve sites. 90% of the adjacent uplands at Cypress Island are managed by DNR for conservation through the Natural Heritage Program. There are several local parks and land trust owned lands adjacent to the Maury Island Aquatic and Cherry Point Aquatic Reserves. There are no adjacent protected uplands at the Fidalgo Bay Aquatic Reserve.

***Partners** - What partners are involved and for what purpose/actions?*

We have developed numerous partnerships for the different reserve. Our most active partnerships currently include:
1. The Skagit River Systems Cooperative – Fidalgo Bay – Shoreline Restoration
2. The Samish Tribe – Fidalgo Bay – Monitoring
3. Skagit County Beach Watchers – Cypress Island – Monitoring
4. The Wild Fish Conservancy – Cypress Island – Monitoring

Enforcement - *Is there an enforcement or management presence on-site?*

No explicit on-site enforcement or management.

On a scale of 1 to 5 with 1 representing little to no enforcement, and 5 representing enforcement on site, what is the level of enforcement at each site?

Enforcement would rate 1.

Permanence *- What is the explicit or implicit duration of protection? Does protection require updating or periodic performance evaluation?*

Reserves are established for 90 years, with management plans requiring updates at least every 10 years.

On a scale of 1 to 5 with 1 representing little to no protection of resources, and 5 representing a prohibition of extraction of all resources, what is the level of protection at each site?

No answer provided

Washington Parks and Recreation Commission

Management objective *- What is the primary management objective for the site? (a) provide recreational opportunities, (b) conservation of one or more species, (c) protection of habitat, (d) education or research, (e) other*

State parks provide recreational access and interpretation of marine areas in a manner that preserves the resources of those areas for the present and future generations. What is protected? – Natural, cultural and recreational resources are protected. As these lands relate to MPAs, non-classified invertebrates harvest is prohibited and algae harvest is controlled. State Parks works with WDFW to manage classified species. What are specific management goals? – State Parks staff manages marine areas to protect marine habitats and avoid the decimation of non-regulated species. What activities take place in the area? – To protect the resources, on-site managers perform routine patrols and contact individuals violating the laws.

On a scale of 1 to 5 with 1 representing little to no management success and 5 representing measurable outcomes with positive results, what is the level of management success at each site?

No answer provided

How can management be improved at the site? What are the obstacles to achieving the primary objectives listed above?

No answer provided

Authority - *What authorities and tools are used to protect this area? (e.g., harvest restrictions, public access, ownership or control of use rights)*

In many of our parks, park rangers live on-site. Where rangers are not present 24 hours/day, State Parks uses volunteer camp hosts/island stewards to maintain a presence. Interpretive staff at Deception Pass State Park requires groups to: check in before accessing intertidal areas, train group guides in marine stewardship; and, stay on established trails. Beach Watchers volunteer during extreme low tide events to assist the park in managing visitors. State Parks rangers are enforcement officers with regulatory authority vested in RCW 79A and WAC 352. State Parks employs harvest restrictions, public access control, ownership or control of use rights to manage marine areas. Also, State Parks is working with DNR to withdraw adjacent lands and/or manage through a programmatic lease agreement.

Establishment *- How was the area established? Briefly describe the process.*

State Parks are established through consideration and approval by the Washington State Parks and Recreation Commission. More recently, State Parks has requested formal designation of Saltwater State Park as an MPA through the WDFW Commission.

Land protection - Is there adjacent terrestrial protection? If there is adjacent terrestrial protection, are there marine-specific management goals?

Mostly yes.
If there is adjacent terrestrial protection, are there marine-specific management goals? - State Parks implements a land use planning process termed "Classification and Management Planning" (CAMP). Through the CAMP process management issues are identified and goals are established. If marine issues are identified through CAMP then marine-specific management goals are developed.

Partners - *What partners are involved and for what purpose/actions?*

What partners are involved and for what purpose/actions? – State Parks works with numerous partners to maintain its lands and provide educational outreach to park visitors. Partners include federal, state, local, and tribal governments; academic partners, businesses, Non-Governmental Organizations, interest groups and volunteers. State Parks works with DNR in the San Juan Islands for shared operation and management of the San Juan marine areas.

Enforcement - *Is there an enforcement or management presence on-site?*

Yes. All locations experience routine patrols. Most locations have an on-site presence

On a scale of 1 to 5 with 1 representing little to no enforcement, and 5 representing enforcement on site, what is the level of enforcement at each site?

No answer provided

Permanence - *What is the explicit or implicit duration of protection? Does protection require updating or periodic performance evaluation?*

State Parks are protected in perpetuity.
Does protection require updating or periodic performance evaluation? - State Parks does not have a

monitoring or performance evaluation program. However, if issues arise with specific management techniques, parks independently change those techniques to improve protection.

On a scale of 1 to 5 with 1 representing little to no protection of resources, and 5 representing a prohibition of extraction of all resources, what is the level of protection at each site?

No answer provided

Washington Department of Ecology, Padilla Bay National Estuarine Research Reserve

Management objective *- What is the primary management objective for the site? (a) provide recreational opportunities, (b) conservation of one or more species, (c) protection of habitat, (d) education or research, (e) other*

Research, monitoring, education, and professiolnal training directed at enhancement and improvement of the health of Puget Sound. Also, habitat protection to insure the long-term integrity of our field research.

On a scale of 1 to 5 with 1 representing little to no management success and 5 representing measurable outcomes with positive results, what is the level of management success at each site?

A comprehensive response: 4

How can management be improved at the site? What are the obstacles to achieving the primary objectives listed above?

Obstacles, other than funding, are primarily surface water flow, development and growth from outside our boundary but within our watershed. Improvements would include an expanded role for several other state & local agencies in addressing stormwater and all water quality issues.

Authority *- What authorities and tools are used to protect this area? (e.g., harvest restrictions, public access, ownership or control of use rights)*

We enjoy direct ownership of our 12,000 acre reserve, with some small private inholdings. Authorities include the Federal Coastal Zone Management Act (Sections 315, 312); Federal Estuarine Reserve Regulations (CFR Title 15, Chapter IX, Part 921), State Shoreline Management Act, Skagit County Shoreline Master Program, Padilla Bay NERR Management Plan, State Hydraulics Code, ACOE and EPA regulatory guidelines, WDF&W harvest restrictions, co-management agreements (WDNR).

Establishment *- How was the area established? Briefly describe the process.*

National Estuarine Reserves (all 27) are state-federal partnerships and the establishment process is codified in the Federal Estuarine Reserve Regulations (CFR Title 15, Part 921). The state must nominate a specific site consistent with these rules, engage in a public review process, insure long-term protection

and funding, and carry out mandatory programs in research, monitoring, education and resource stewardship subject to federal evaluation and performance measures.

Land protection *- Is there adjacent terrestrial protection? If there is adjacent terrestrial protection, are there marine-specific management goals?*

Estuarine reserves have specific boundaries which include both core and buffer lands and tidelands. We own some surrounding upland "buffer" areas, and cooperate with several other agencies and landowners. A comprehensive watedshed management plan has been prepared and adopted under state and county jurisdiction, containing both marine-specific objectives and implementation strategies.

Partners *- What partners are involved and for what purpose/actions?*

The reserve (Ecology) works with many offices within its own agency, NOAA, universities, the NW Straits Initiative, WDNR, WDFW, PSP, Sea Grant, Skagit County, the Smithsonian, Conservation Districts, tribes, other reserves (coastal U.S.), EPA, ACOE, private labs, NGOs, industry and agriculture in research, monitoring, and natural resource management programs and projects. Education and training programs work with 50+ schools districts, ESDs, SPI, universities, other agencies, local government staff, citizen volunteers, NGOs, NOAA, and the PSP.

Enforcement *- Is there an enforcement or management presence on-site?*

Yes, all facilities and staff are on-site and boats in the water on at least a weekly basis.

On a scale of 1 to 5 with 1 representing little to no enforcement, and 5 representing enforcement on site, what is the level of enforcement at each site?

Estimate: 4

Permanence *- What is the explicit or implicit duration of protection? Does protection require updating or periodic performance evaluation?*

Protected in perpetuity under the state/federal agreement. Comprehensive performance evaluations are required by federal regulations at least once every 3 years.

On a scale of 1 to 5 with 1 representing little to no protection of resources, and 5 representing a prohibition of extraction of all resources, what is the level of protection at each site?

4. No extraction is allowed except hunting and fishing managed by WDF&W regulations and tribal treaty.

APPENDIX 4: SUMMARY OF MONITORING PRACTICES

Each MPA manager representing an agency presented a brief outline of current monitoring practices to the MPA Work Group in order to develop a common understanding of the current monitoring techniques and approaches in use at Washington State MPAs. Speakers were asked to describe current monitoring activities (purpose, frequency and duration, analysis and use of data), explain whether or not there is an existing monitoring plan for the MPA(s), describe impediments or challenges to effective monitoring, and provide any recommendations to improve monitoring or use of results in management decisions.

National Oceanic and Atmospheric Administration, Olympic Coast National Marine Sanctuary

Responder: Liam Antrim

Olympic Coast National Marine Sanctuary (OCNMS) covers approximately 300,000 acres (3,300 sq. n.mi.) off the outer coast of the Olympic Peninsula. OCNMS was designated for conservation and protection of all natural and cultural resources in the area. OCNMS supports sustainable use of natural resources and allows most uses that are conducted in a sustainable manner if they do not significantly degrade habitats. The large area and broad interests of OCNMS do not provide narrow focus to its monitoring programs, which are founded on collaboration with other agencies and organizations to improve our understanding of the condition (or "health") and trends in key populations and habitats.

The following summary of current monitoring activities includes work for which the sanctuary is a partner, major or minor, through active participation, sharing of resources, or funding.

<u>Kelp</u>

Purpose: mapping nearshore kelp beds distinguishing *Nereocystis* and *Macrocystis*

Frequency and duration: annual survey; one day per year

Analysis and use of data: digital maps of annual kelp distribution; potential analysis of trends in distribution/areas covered, species distributions, and analysis for local impacts (if any are identified).

Existing monitoring plan: Standardized monitoring methods are used

Partners: WDNR, others?

<u>Sea Otters</u>

Purpose: population estimate

Frequency and duration: annual survey; one or two days per year

Analysis and use of data: population estimate, distribution, and trends analysis

Existing monitoring plan: Standardized monitoring methods are used

Partners: USFWS and WDFW

Other: A sea otter "health" study published in 2009 provided baseline data for chemical contaminants, pathogen exposure and general health status of Washington's sea otters.

Seabirds

Purpose: nesting population estimates; on-water abundance and distribution

Frequency and duration: periodic nesting population surveys; ideally once per year but not always accomplished. In addition, on-water nearshore abundance/distribution surveys are conducted monthly during summer by OCNMS.

Analysis and use of data: population trends; linkage of population trends with ocean productivity cycles; on-water species presence, abundance, and distribution

Existing monitoring plan: Standardized monitoring methods are used

Partners: USFWS, WDFW, Audubon, others

Marine Mammals

Purpose: visual sightings of offshore distribution and abundance

Frequency and duration: ideally annual (funding and ship time dependent); once per year during 7-14 day research cruises

Analysis and use of data: pending

Existing monitoring plan: Standardized monitoring methods are used

Marine Mammals

Purpose: acoustic monitoring for killer whales and other cetacean vocalization

Frequency and duration: year round, recent years

Analysis and use of data: pending

Existing monitoring plan: Yes

Partners: Scripps, NMFS

Water Quality

Purpose: understand nearshore physical and chemical oceanography

Frequency and duration: annual buoy deployment during summer months (April/May through September/October) since 2000

Analysis and use of data: identification of upwelling events, low oxygen conditions, nearshore currents, trends in standard water quality parameters (not chemical contaminants), linkage to harmful algal bloom events; data is shared via the web.

Existing monitoring plan: Yes

Partners: PISCO, UW, others

Intertidal Invertebrate and Macroalgae

Purpose: baseline data and trends

Frequency and duration: annual during summer months; once per year (per site)

Analysis and use of data: baseline data set that complements comparable monitoring by Olympic National Park (ONP) and West Coast-wide MARINe (Multi-Agency Rocky Intertidal Network)

Existing monitoring plan: Standard protocols are used.

Partners: ONP, MARINe, Makah Tribe, Quinault Nation

Fish

Purpose: baseline data on abundance, distribution, habitat use and trends

Frequency and duration: miscellaneous

Analysis and use of data: NMFS data used for stock assessments; REEF data used for localized population trends

Existing monitoring plan: Standard protocols are used.

Partners: NMFS, REEF, others

Impediments or challenges to effective monitoring?

- Large size/area and broad interest of OCNMS
- Expense and sparse funding limits ship and aircraft time
- Funding limits data management and analysis efforts
- Avoidance of wildlife disturbance during surveys

Recommendations to improve monitoring or use of results in management decisions

- Continue to leverage funding through partnerships

- Improve use of centralized databases to facilitate data availability
- Promote data analysis by Sanctuary staff (if additional funding sources are identified) or by partnership with academic programs
- Incorporate monitoring results/findings into outreach activities
- Target monitoring towards identified management issues (e.g., through ongoing OCNMS management plan review)
- Integrate monitoring goals and interests from multiple agencies and governments

National Park Service, Olympic National Park

Current monitoring activities

Olympia National Park's (ONP) monitoring activities include monitoring at Lewis and Clark National Historic Park and San Juan Island National Historic Park. This summary will focus on ONP activities. ONP monitoring activities have three main components: rocky, sand beach intertidal monitoring, and intertidal temperature. Temperature monitoring takes place at nine sites along the 70 mile park shoreline with data loggers taking readings every half hour year round. The data loggers are located in the mid-intertidal zone. Temperature data loggers are also used at two sites in San Juan Islands: English and American Camps.

Sand beach monitoring for infauna, and grain/sediment size, and beach profile takes place at seven sites in ONP, one in each of four oceanographic cells in ONP (although the northern cell has only one sand beach). There is no sand beach monitoring in the San Juan Islands. Sand beach monitoring takes place in the Summer monthly only and results are used to examine inter-annual trends (not seasonal trends).

Rocky intertidal monitoring focuses on invertebrate and macro algal community structure using marine protocols developed by the multi agency rocky intertidal monitoring network or MARINe, a consortium of agencies and universities who have developed standardized protocol for looking at target species and community structure. Four rocky intertidal sites are monitored at ONP and two on San Juan Island at English and American Camps. ONP also has sites that monitor the broader community structure called "community plots". These larger plots are used to examine at elevational differences within communities to detect elevational shifts due to storms or climate change.

In addition to these long term monitoring efforts, ONP also conducts some species specific targeted monitoring for harvested species in partnership with WDFW and tribes (e.g. razor clams in Kalaloch).

Monitoring results are analyzed on an annual basis and presented in an annual report. Every five years ONP produces a trend analysis used to inform park management.

Existing monitoring plan?

ONP has an official plan, called a "protocol", that applies to several national parks in the North Coast Cascade National Park Network.

Impediments or challenges to effective monitoring?

Challenges include scarce resources such as monitoring funds and staff. The National Park Service has a Congressionally-mandated monitoring program, called "NPS's Natural Resource Challenge", that is very helpful, but still doesn't meet monitoring needs. This program is funded separately from NPS's base budget.

Recommendations to improve monitoring or use of results in management decisions

ONP's monitoring program is relatively new (5-8 years old) and efforts are just beginning to deliver results that will support management decisions, but it's too early to assess how well the program works. ONP leadership is supportive of monitoring activities and interested in incorporating results into park decisions. Interagency coordination through formal links would leverage existing monitoring efforts.

U.S. Fish and Wildlife Service, Washington Maritime National Wildlife Refuge Complex

Current monitoring activities

On the outer Washington coast the Service flies seabird nesting surveys of Flattery Rocks National Wildlife Refuge (NWR), Quilayute Needles NWR, and Copalis NWR concentrating on Common Murre, and Brandt's, Double-crested and Pelagic Cormorants. In the past these surveys have been conducted annually but have not been accomplished the last few years due to budget constraints. On inland waters (Puget Sound) surveys are conducted annually using Service water craft in the San Juans Islands NWR and by foot and boat at Dungeness and Protection Island NWRs. Emphasis has been on breeding birds and marine mammals using Refuge lands but also includes wintering species at Dungeness NWR with emphasis on black brant. The Service is also monitoring for the presence of invasive species on its lands and for European green crab in tidal areas of Dungeness NWR.

Existing monitoring plan?

The Service has a monitoring plan for the surveys identified. The Service is developing a Seabird Inventory Monitoring Manual for the California Current System to standardize efforts on the west coast.

Impediments or challenges to effective monitoring?

The single greatest challenge is sufficient funding to conduct monitoring, particularly aerial surveys with declining budgets. Staffing limitations have also affected our ability to adequately monitor.

Recommendations to improve monitoring or use of results in management decisions

Monitoring results are used by the Service both in planning and everyday operations decisions. Interagency coordination and pooling of staff resources would enhance monitoring efforts and results.

University of Washington, Friday Harbor Laboratories, San Juan County/Cypress Island Marine Biological Preserve

The San Juan County Marine Stewardship Area Monitoring Plan covers most of the ***Marine Biological Preserve managed by the University of Washington Friday Harbor Laboratories*** (except Cypress Is.). This plan was developed by the San Juan County Marine Resources Committee on October 31 2008 provides an overview of monitoring activities. UW FHL is actively involved in many of the monitoring efforts described below.

The San Juan County Marine Resources Committee (MRC) and the Marine Stewardship Area (MSA). The Marine Resources Committee (MRC) is a citizen advisory committee appointed by the San Juan County Council. The MRC developed and implemented the Marine Stewardship Area Plan (MSA Plan), approved by the County Council in 2007.

The San Juan Board of County Commissioners (now County Council) designated the waters of the entire County a ***Marine Stewardship Area*** with the stated objective: "to facilitate the protection and preservation of our natural marine environment for the tribes and other historic users, current and future residents, and visitors". With this resolution, the Marine Resources Committee (MRC) was charged with providing a formal study with detailed recommendations for achieving this goal. The MRC thus began collecting and mapping available marine resources data to get a better picture of San Juan County's marine life, habitats, as well as potential measures that would help protect them.

Need for a Monitoring Plan. Despite the best efforts of the MRC to document the county's marine resources, data do not exist to accurately assess the status or trends of all marine resources within the MSA. A particular shortcoming is that, frequently, data are only sufficient to describe the status of a particular species at one point in time and/or at one or very few sites. This attribute of existing data handicaps efforts to determine the current status of knowledge regarding species, habitats and communities and prevents an analysis of trends related to the threats from human activity and development. Moreover, the influence of environmental change resulting from the predicted shift in hemispheric and regional climate (e.g. warmer temperatures, wetter winters) on the range and distribution of native species and the spread of invasive species and disease may not be detected.

The first attempt to synthesize information and standardize a monitoring program occurred with the creation of CAO Best Available Science document (BAS 2008), produced by the CAO BAS Committee, with input from the MRC and other groups. This document and the MSA Monitoring Plan outline the need for additional descriptive information for marine species and the habitats in which they thrive, and advocate a systematic monitoring program of selected parameters designed to yield status and trend information for benthic and pelagic habitats. Without this program, valuable ecosystem services may not be protected, thereby jeopardizing the sustainability of the MSA.

We understand funding is limited and that a systematic and sustained monitoring program cannot rest solely on the volunteer labor or over-committed county staff. Fortunately, a number of monitoring programs already exist throughout the Puget Sound Region, detailed in the Puget Sound Ambient

Monitoring Program (PSAMP Update, 2007) and other recent compilations. In some cases, these programs are adequate to evaluate impact to the MSA (e.g. spawning biomass of Pacific herring, adult salmon populations, pinto abalone abundance, and resident orca populations), and in other cases, while there is a reasonably adequate regional monitoring program, data collection within San Juan County is not sufficient to evaluate impact within the county. In the latter case, it may not be sufficient to rely on federal or state programs to adequately monitor benthic and pelagic systems within the MSA. Rather, federal and state monitoring programs, augmented by a county sponsored program, will be needed. There are also situations where a resource is monitored within the MSA, but at only one or a few sites; locally funded programs can enhance ongoing population monitoring. Finally, there will be many cases where species or groups of species, found to be locally important fall outside existing monitoring programs, and our task will require designing a program to adequately protect ecosystem health and biodiversity within the MSA.

Successful monitoring programs are designed to alert resource managers that protected resources are in jeopardy and to evaluate the effectiveness of protective measures. Within the MSA this design must take into account multiple natural and modified habitat types in benthic and pelagic regions. While the location of monitoring sites will depend on specific objectives (e.g. water quality assessment, population abundance and distribution, community structure, etc.) effort must be made to consider the MSA as a functioning sub-unit within larger regional jurisdictions with sampling occurring at a suitable frequency to compute status and trend estimates. Because this objective is broad in scope, partnering with federal, state and tribal resource management agencies, NGOs, and others is essential.

Targets of the MSA Plan are defined as those groups of species, and entire biotic communities, that are critical to conserve and protect ecosystem services and biodiversity within the MSA. and which must be monitored to determine their current status and direction of change. Some targets are chosen because the distribution and density of these species or communities are poorly known but population stability is threatened by particular activities that are on the rise (e.g. by-catch associated with fish harvest, stormwater discharge over intertidal communities). Others are targets because the link between human activity and species decline has been established (e.g., recreational harvest of groundfish, impact of over-water structures on nearshore benthic plant survival and juvenile fish migration). The MSA Plan identifies the following targets:

- Rocky intertidal communities
- Rocky subtidal communities
- Nearshore sand, mud and gravel communities
- Rockfish, lingcod and greenling
- Seabirds
- Marine mammals
- Pacific Salmon, forage fish

For each of these targets, the MSA Plan also identifies key ecological attributes (KEAs), or ***indicators*** which are either species, groups of organisms, or chemical/physical processes which allow an assessment of ecosystem stability and biodiversity. The MSA Plan also sets out three ***socio-cultural targets*** involving human use of the marine environment and various species. They are: Enjoyment of the marine environment, Support for marine-based livelihoods, Maintenance of Cultural traditions including ceremonial, subsistence, and spiritual uses and aspects.

Threats Affecting Marine Biodiversity. In addition to targets noted above, the MSA plan also identified and defined sixteen ***threats*** affecting marine biodiversity targets within the MSA (Table 2, MSA 2007). These threats must also be monitored to determine their persistence and importance, to document the trajectory of influence and evaluate the effectiveness of regulations designed to protect ecosystem services and biodiversity.

Ecosystems and Biological Resources. As part of this process, we sought input from members of the Marine Resources Committee Science Subcommittee. Each member was tasked with compiling a list of elements they deemed integral to a monitoring program in their area of expertise. To augment and enrich this effort, we also interviewed a select group of regional scientists and resource managers using a structured interview format. Many of the species, habitats and ecosystem components discussed here have also been covered in the San Juan County MSA Plan (2007) and the San Juan County Best Available Science for Critical Areas document (2007). For the broader Puget Sound Region, the 2007 Puget Sound Update (PSAT 2007) is extremely informative. These three documents contain excellent maps of biological resources, habitats, protected areas and other data relevant to this monitoring program. This document will not undertake to duplicate all the information provided in the BAS document, but will be limited to discussion of existing monitoring programs, and recommendations for future monitoring. Background information, existing status, and information from other regions will be brought in as needed, but is not meant to be comprehensive.

Species and Groups of Concern. The MSA includes species considered endangered or threatened, as well as species whose populations have declined significantly over the past century or over recent decades. While we are concerned with the biodiversity of the MSA overall, we will also pay particular attention to species whose populations are in danger within the MSA or within the broader region. Examples would be orcas, abalone, native oysters, eelgrass, rockfish, and Chinook salmon. Species and groups of concern are also set out as targets in Table 1 of the MSA Plan (2007). For the larger region, PSAMP (2007, Table 2-1) lists 63 species of concern in Puget Sound (Gaydos 2004), defining them as those species that "require special initiatives to ensure protection and survival of their populations". Of these, three were invertebrates, 27 were fishes, 23 were birds, nine were mammals and one was a reptile. Fourteen of these species are defined as threatened or endangered by the federal government or by the state. Most, if not all, of these are species of concern for the SJC MSA as well.

Database of Monitoring Efforts in the MSA. An important part of this exercise was the identification and listing of all monitoring programs, regardless of status, that have occurred or are occurring in San Juan County. In Appendix I, we list, in a database format, all existing programs being conducted by federal, tribal, state and county governments and NGOs such as Friends of the San Juans and The Nature Conservancy (certain programs that have been terminated are also listed. We strongly suggest that the

future monitoring of the MSA targets must include the continuation of ongoing programs as well as the selective resumption of programs that have been terminated.

Current Monitoring. In the course of various investigations, researchers at FHL have created time-series of selected physical and biological metrics, and recently initiated (2006) a series of permanent stations throughout the SJA, beginning with the Marine Reserves maintained by UW FHL and WDFW on San Juan Island (3), on Shaw Island (1) and on Yellow and Low Islands, and the Bottomfish Recovery Zones established by San Juan County. Each site includes data collection on the physical conditions (temperature, wind, salinity, water flow, irradiance) and on the biological communities (benthic transect counts, photo transects, fixed photo quadrats, diver and ROV surveys) over a broad depth range (intertidal to 30 m or greater). Permanent stainless steel pins were cemented into rock crevices at 50 locations on the SJI Preserve just south of Pt. Caution. Similar markers were placed at Yellow Is., and long-term lead line transects were placed off Pt. George, Shaw Island, in 2003 for fish population studies. FHL is providing funds to monitor these areas, and others yet to be established, on a permanent basis. Yellow Island surveys (by M. Dethier et al.) have been funded by the Nature Conservancy. UW researchers (UW SAFS B. Miller, D. Gunderson, E. Eisenhardt, with WDFW: W. Palsson) have conducted shallow and deep water ROV video surveys at many sites along San Juan Channel during 2004 and 2005. These data are archived at UW SAFS and at FHL, and are currently being quantified for invertebrate and algal abundance (fish counts have already been completed). We have sited some of these permanent stations where there has been previous research, including intertidal transects repeatedly sampled for over two decades (since 1987. M. Dethier, T. Klinger), subtidal sites used for long term rockfish surveys and video survey sites (2004, 2005) along San Juan Channel. We are also building a permanent database, via a thorough literature search including the many unpublished reports in the FHL library, to determine any and all sites where population or community surveys have been carried out in the past. If we can site our ongoing studies in some of the same locations as these historical studies, our findings will be easier to compare.

Specific Recommendations of the MRC for Implementation of the Monitoring Program:

1. Certain species will be monitored by federal or state agencies, and the county (MSA) will rely on those data sources to determine the health and viability of those populations: these include orcas (killer whales), abalone, adult salmon, forage fish in offshore habitats, floating kelp beds, many marine and coastal birds, groundfish in Marine Preserves and certain non-preserve areas.

2. Certain threats will be monitored by federal or state agencies, and the county (MSA) will rely on those data sources to determine levels of threat within the MSA.

3. Certain species being monitored by state agencies must also be monitored locally to derive sufficient spatial and temporal information for determinations of population health and viability. These include: groundfish in voluntary no-take (and comparison) areas established by the county (MRC), eelgrass in embayments and near/under over-water structures within the MSA, forage fish in nearshore habitats, juvenile salmon in nearshore habitats, salmonids in streams, and marine mammals in local habitats (including interactions with humans).

4. Certain conditions and threats being monitored by state agencies must also be monitored locally to derive sufficient spatial and temporal information for determinations of environmental change and level of threats. These include: water column physical, chemical and biological characteristics being monitored nearby (JEMS), but not at any, or enough, sites within the MSA.

5. Certain species and biological communities are not being monitored by federal or state agencies and must be monitored locally if we are to have any idea of their current status and detect changes over time. These include: rocky intertidal and subtidal communities and their component species (e.g. sea urchins, sea cucumbers, kelp), and soft sediment intertidal and subtidal communities and their component species (e.g. clams, worms, sand lance). This includes presence of nonindigenous (invasive, exotic) species, overall biodiversity, changes in trophic structure (food webs), and response to environmental change (e.g. warming, acidification).

6. ***Certain physical and chemical conditions are not being monitored by federal or state agencies and must be monitored locally*** if we are to have any idea of their current status and detect changes over time and level of threat. These include specific toxic chemicals and nutrients in coastal water, streams, and stormwater and wastewater outflow areas, discharges from desalinization plants, contaminants present in intertidal and subtidal sediments (baseline for oil spills), physical modification of shorelines, increased sediment loading from construction.

7. Sociocultural targets must be monitored locally to determine how MSA protection is affecting local stakeholders. These include: enjoyment of the marine environment, support for marine-based livelihoods and maintenance of cultural traditions including ceremonial, subsistence, and spiritual uses and aspects.

Washington Department of Fish and Wildlife

Respondent: Wayne Palsson

Since 1990, the Washington Department of Fish and Wildlife has established marine reserves in Puget Sound to conserve fish and wildlife resources and provide watchable wildlife opportunities (Figure 1). Presently, WDFW has twenty-six intertidal or subtidal reserves in its system. Some are complete no-take zones while others protect specific resources from harvest. Sixteen of these reserves contain rocky habitat likely to protect rockfishes, lingcod, and other species that are associated with rocky habitat.

Beginning in the early 1990's, the Marine Fish Science Unit of WDFW began monitoring the response of some marine fish species to the no-harvest protections provided by the no-harvest reserves. The goal of the monitoring program is to determine how the groundfish communities are structured in the absence of fishing. Specific objectives are to test whether species composition, fish densities, sizes, and reproductive effort differ before and after reserve creation and whether these variables differ from comparable areas that are open to fishing. Monitoring is primarily accomplished with visual surveys using scuba but also has included using remotely operated video cameras. These monitoring activities include:

- Central Sound Response Studies: Since 1993, Marine Fish Science staff has conducted scuba transects at fixed positions at the long-term reserve at Brackett's Landing (Edmonds Underwater Park), Keystone, and Orchard Rocks Conservation Areas to determine changes in species composition, density, and sizes of fishes. Brackett's Landing essentially became a no-take area by local ordinance in 1970, and Orchard Rocks became a reserve in 1998, after it had been monitored since 1993. The Keystone Conservation Area was established in 2002 and was also monitored prior to reserve establishment. At the same time three comparable sites open to fishing are monitored in central Puget Sound in order to compare the same variables between fished and un-fished treatments. The visual survey method was adapted from Matthews (1990) who conducted a series of strip transects in the 1980s at some of the very same sites. A team of divers visits each site six times per year during the spring and fall months. Two scuba divers conduct visual strip transects at these sites, and they identify, count, and measure all the fishes larger than 5 cm along a 90 m transect with a width of three meters.

- Friday Harbor Marine Preserve Study: Since 1992, WDFW staff has conducted similar scuba strip transects as the Central Sound study at the Friday Harbor Marine Preserve. Two permanent transects are located within the reserve at Shady Cove and two transects are located at Turn Island, a popular fishing area in San Juan Channel.

- Reserve Censuses: Prior to and after the creation of the Colvos Passage and Zee's Reef Marine Reserves, the areas of the isolated rocky habitats were measured and mapped. Divers have conducted complete censuses of each rocky footprint six times per year to determine species composition, fish abundance, and size. Similar studies have been conducted at the three Hood Canal Conservation Areas at Sund Rocks, Octopus Hole, and Waketickeh Creek, but the survey pattern was modified at these sites to track fish abundance by depth zones. This modification allowed WDFW staff to examine the response of rockfish, lingcod, and other marine fishes to hypoxia (Palsson et al. 2008).

- San Juan Lingcod: Beginning in 1992 and developing later, sites at Friday Harbor Preserve and fished sites at Turn Island have been surveyed specifically for lingcod abundance, size, and nesting frequency during the winter. The scuba survey methods target nesting lingcod during the winter and are adapted from LaRiviere (1981). Surveys are conducted during the peak of the nest guarding period in February and early March. Some data points are comparable to those of LaRiviere in 1979-1980. A line-transect survey covering a lineal distance of 250 m along rocky habitat is swum by a lead diver and a second diver who guides the lead diver from two baselines. The lead diver first swims a zig-zag course along a -15 m mean lower, low water depth baseline out to a depth of -20 m. Each offshore and inshore transect starts and finishes along successive 10 m points along the 100 m baseline. After swimming the deep leg, the divers ascend to a shallow baseline located at a depth of -5 m. They swim and survey100 m back to the starting point. The effective transect width is one half of the measured, black-body visibility at depth. Lingcod nests, fish, and fish size are recorded on a map of each transect and site.

- Toliva Shoal Artificial Habitat and Closure: Beginning in 2003, WDFW began monitoring eight

permanent transects at Toliva Shoal in southern Puget Sound on and near an existing artificial habitat created in the late 1970s and 1980s to attract adult rockfish and lingcod. As mitigation for building the Second Narrows Bridge, a research project was created to examine the efficacy of enhancing the performance of the adult reef with smaller rock aimed at attracting juvenile rockfishes. Divers swam strip transects six times per year between 2003 and 2007 before and after the creation of juvenile rockfish habitat. A partial-take marine reserve was created in 2005 to protect bottomfish except lingcod during the spring recreational fishery. Monitoring will be conducted every two years for several more years.

- Other subtidal reserves: Other subtidal reserves are occasionally surveyed by scuba and other techniques as opportunities become available. The reserves at Admiralty Head, False Bay, Shaw Island, Yellow and Low Islands, and Titlow Beach are visited by the WDFW dive team who conducts haphazard transects to monitor species composition, size, and density where practical.
- Quantitative Video Surveys of Rocky Habitats: WDFW staff has used drop and remote-operated vehicles as video platforms to quantitatively survey fish densities. Some of these surveys have been conducted in subtidal reserves and at fished sites. The ROV, in particular, is a versatile tool to survey fishes in shallow and deep water(Pacunski et al. 2008). At present, ROVs are not regularly used in WDFW reserve monitoring.

Figure 1. WDFW Marine Reserves.

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Washington Department of Natural Resources, Aquatic Reserves Program

The Aquatic Reserves Program currently has two extensive monitoring efforts underway or recently completed.

1. Cypress Island Nearshore Fish Usage Assessment.

    a. Purpose – Baseline assessment of the utilization of nearshore habitat surrounding Cypress Island by juvenile salmonids and other marine fishes. There is currently a general lack of information with regard to nearshore-intertidal and subtidal species assemblages and fish utilization of the marine waters surrounding Cypress Island.

    b. Frequency and Duration – The project began in late February and will go through October to capture the entire juvenile salmon outmigration. Sampling occurs twice per month, every other week.

    c. Data will be analyzed at the end of the sampling season and look at the timing, extent and species composition of the nearshore and estuarine habitats throughout the Cypress Island Aquatic Reserve. Cypress Island is essentially an undeveloped, completely intact nearshore and upland ecosystem. This data can be used to provide an understanding of the fish usage of such intact ecosystems.

2. Fidalgo Bay and Maury Islands Aquatic Reserve Eelgrass Survey

a. Purpose – Determine abundance and depth distribution of eelgrass at two Aquatic Reserves.

b. Frequency and Duration – Sites were sampled once during the 2008 field season.

c. Analysis and use of data – This data will be used as a baseline against which to compare future monitoring data. We will also use this information to help inform future management and restoration efforts at the two Reserves.

In June 2009 DNR released a report entitled *Eelgrass Abundance and Depth Distribution at Two Environmental Aquatic Reserves: Maury Island and Fidalgo Bay*. Please see this report for more information.

Existing monitoring plan? We don't have specific monitoring plans for each reserve; however we do identify monitoring needs and data gaps in the site specific management plans for each reserve. The program would like to develop monitoring plans for each reserve but we are limited by lack of funding and staff.

Impediments or challenges to effective monitoring? Limited funding and staff, both of which limit the amount of monitoring we can do, as well as limit our ability to pursue partnerships for effective monitoring.

Recommendations to improve monitoring or use of results in management decisions. I would recommend that the MPA Work Group try to foster partnerships and coordination between various entities to fill gaps in monitoring needs. Various partners are conducting extensive monitoring efforts and it might be as simple as recommending the development of a monitoring data base that includes all existing data for the MPA's in the inventory. There is probably a fair amount of overlap in monitoring efforts, due in part to the lack of comprehensive knowledge of monitoring activities occurring at MPA's. Some of the MPA's managed by different agencies are vast and the managing entities may not be aware of all of the monitoring activities taking place.

Washington Parks and Recreation Commission

Describe current monitoring activities

Purpose – State Parks develops monitoring plans for its parks for three purposes: 1) Site Specific Management Needs; 2) As part of a regulatory requirement associated with constructing a marine facility; and, 3) Through Partnerships.

1) State Parks classifies its lands through a public process. During that public process issues are identified that require management actions. State Parks develops management plans based upon the issues identified in the planning process. If a management plan requires monitoring, or if monitoring becomes a management issue, Parks would develop a Site Specific Plan. State Parks has taken this action at Sucia Island – boats anchoring in eelgrass; Deception Pass –

Rosario Head tidepool interpretive walk; Limekiln Point State Park, impacts associated with visitor use.

2) When the agency develops marine facilities regulatory agencies sometimes require monitoring to better understand impacts associated with facility development. Dosewallips – salmon surveys to understand impacts of seal fence; Saltwater – nearshore juvenile salmonid predation by rockfish and other lie-in-wait predators.

3) A number of partners have petitioned the agency to improve their understanding of marine resources. Some of these partners work through scientific research permits. Some work with the park through on-going park programs. State Parks has worked with Beach Watchers, Friends of PS, Local Marine Resources Committees, Other agency research programs, tribes, Cascadia Marine Research.

   Frequency and duration – depends on type and partner, and is generally controlled by external needs and/or management issue.

   Analysis and use of data - depends on type and partner, and is generally controlled by external needs and/or management issue.

Existing monitoring plan?

There is no existing general monitoring plan governing the management of State Parks marine areas. Site specific plans are developed based upon issue identification.

Impediments or challenges to effective monitoring? The purpose of State Parks and limited budget are impediments to effective monitoring. State Parks staff are not hired to monitor marine resources, they are law enforcement officers hired to provide appropriate access and interpretation of the natural, historical, and recreational resources of the state. Park rangers look to others for resources to help them understand issues they should be concerned about, and to provide the appropriate level of stewardship for the park and its resources. To provide more effective monitoring we would need to identify the resources (not necessarily within the agency), the purpose, and the duration required, followed by recommended actions required by the findings.

Recommendations to improve monitoring or use of results in management decisions. Unfortunately, State Parks is in a reactionary position. In order to improve monitoring, risks and threats to park stewardship must be identified, consequences of inaction made clear, and resources must be provided to support monitoring and follow-up actions called for by the results of monitoring.

Washington Department of Ecology, Padilla Bay National Estuarine Research Reserve

Respondent: Doug Bulthuis, Research Coordinator, Padilla Bay National Estuarine Research Reserve

The mission of the Padilla Bay National Estuarine Research Reserve is:

To promote improved management and stewardship of estuarine ecosystems in the Columbian/Puget Sound Biogeographical region through research, monitoring, education, training and interpretation.

Goal of Research and Monitoring at Padilla Bay NERR:

To promote, conduct, and coordinate research and monitoring in Padilla Bay and adjacent waters and watershed to advance scientific knowledge for the conservation, management, restoration and greater understanding of the nation's estuaries, in particular, greater Puget Sound and other estuaries in the Pacific Northwest

Padilla Bay NERR as an MPA (regulatory framework for PBNERR)

Padilla Bay NERR as a Federal/State Cooperative: Padilla Bay NERR is managed by Washington State Department of Ecology and the NERR System is coordinated by the Estuarine Reserves Division in NOAA/NOS/OCRM.

Monitoring in Padilla Bay National Estuarine Research Reserve:

Overall goal of the Padilla Bay NERR monitoring program is:

"To measure short-term variability and long-term changes in important biological communities and water quality parameters in the Padilla Bay estuary"

Monitoring of important biological resources
- Eelgrasses:
  - Annual aerial photos (when possible)
  - Mapping of eelgrasses, macroalgae, and salt marsh vegetation (when funded): 1989, 2000, 2004, 2008.

NERRS-System-wide Monitoring Program (SWMP) at Padilla Bay
- Basic water quality at four sites in Padilla Bay (since 1995) (Figure 2)
  - frequency: every 15 minutes
  - parameters:
    - temperature
    - salinity
    - dissolved oxygen
    - pH
    - turbidity
    - water depth
- Nutrients and chlorophyll (since 2002)
  - frequency: two times a month
  - locations: four sites in Padilla Bay
  - parameters:
    - dissolved inorganic nitrogen: nitrate, nitrite, ammonium
    - orthophosphate
    - total nitrogen and total phosphorus
    - total dissolved nitrogen and phosphorus
    - silicate

total and volatile suspended solids
chlorophyll a and phaeophytin
frequency: hourly for 26 hours, once a month
locations: one site in Padilla Bay
parameters:
dissolved inorganic nitrogen: nitrate, nitrite, ammonium
orthophosphate
silicate
chlorophyll a and phaeophytin
Weather (since 2001)
frequency: every 15 minutes
location: Padilla Demonstration Farm on shore of Padilla Bay
parameters:
temperature
humidity
wind direction and speed
barometric pressure
precipitation
photosynthetically active light
Near real time data (since 2007)
weather data
basic water quality at one site (will be adding a second)
Other parameters:
Zooplankton (internal funding, started 18 months ago))
frequency: monthly
locations: three water quality sties
identified to broad taxonomic categories
Barnacle settlement (internal funding, AmeriCorps staff)
frequency: every 2-3 weeks
locations: three water quality sites
number for all species per unit area per unit time
Marine birds
opportunistic, relying on other agencies
recent summary for Padilla Bay by Eric Anderson, Padilla Bay Graduate Research Fellow
Harbor seals
opportunistic, relying on other agencies and universities, some funding by Padilla Bay NERR
incorporated into M.S. theses or as reports to Padilla Bay NERR
Fecal coliform in sloughs flowing to Padilla Bay
opportunistic, relying on adult volunteers and partnership with Skagit Conservation District
Analysis and use of data:
Researchers in Padilla Bay
Syntheses and comparisons among all NERRS
Analyses and reports by Padilla Bay staff
NERRS System-Wide Monitoring Program data available on the internet:
Web sites:
Padilla Bay research: http://padillabay.gov/researchoverview.asp

Padilla Bay monitoring: http://padillabay.gov/researchmonitoring.asp

Padilla Bay NERRS SWMP data 1995-present: http://cdmo.baruch.sc.edu/QueryPages/stationmap.cfm?Site_ID=PDB

Padilla Bay near real time water quality at Joe Leary Slough: http://www.nanoos-shellfish.org/Washington/16.aspx, and http://amazon.nws.noaa.gov/nexhads2/jsp/dipper/prepareDCPChart2.jsp?nesdis_id=3B005706&nwsli=PBFW1&pe_code=TA

Padilla Bay near real time weather at HADS site: http://amazon.nws.noaa.gov/nexhads2/jsp/dipper/prepareDCPChart2.jsp?nesdis_id=3B004470&nwsli=PBLW1&pe_code=WS

Padilla Bay near real time weather at National Weather Service site: http://www.wrh.noaa.gov/mesowest/getobext.php?wfo=sew&sid=PBFW1&num=168&raw=0&dbn=m

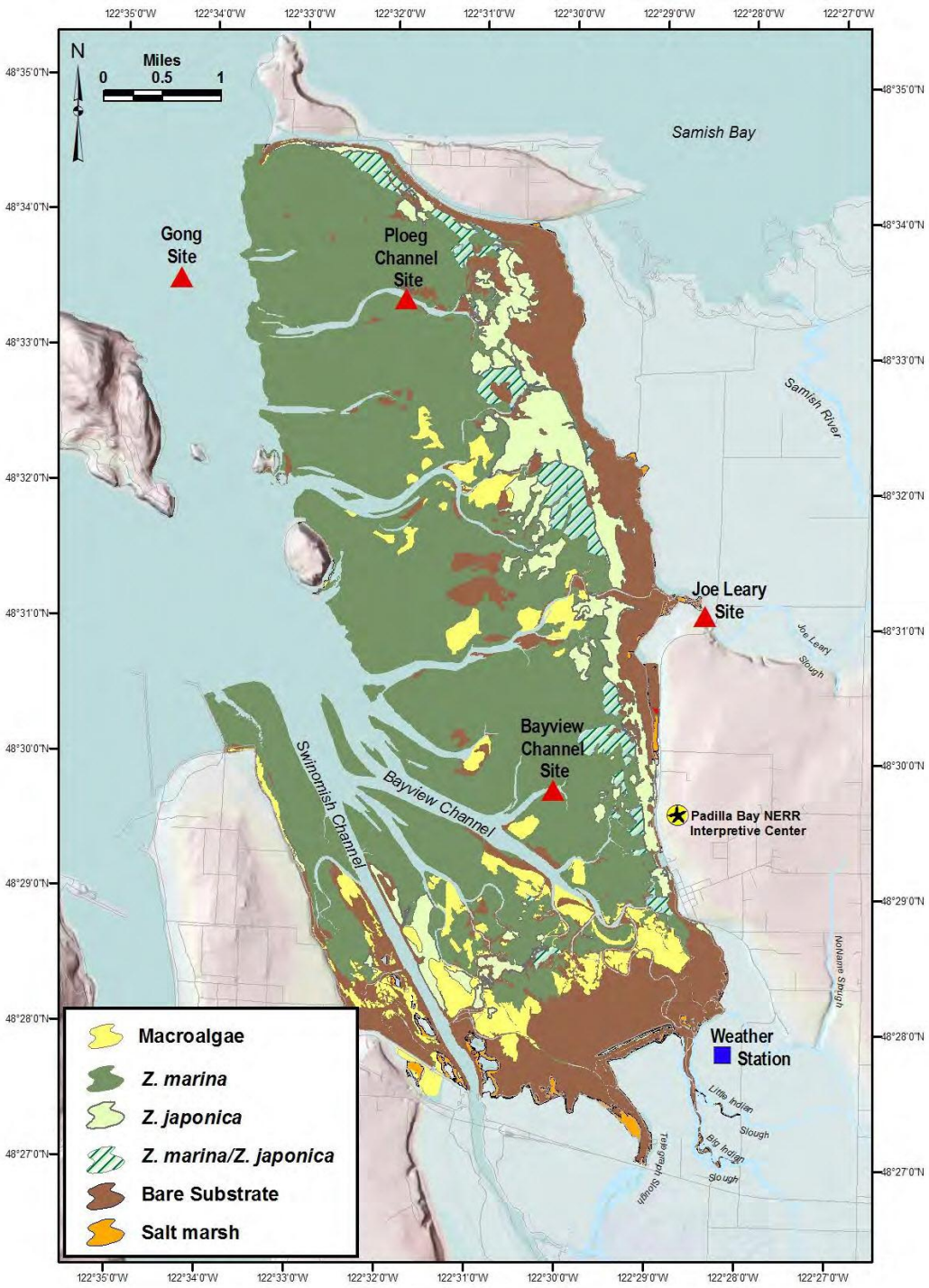

Figure 2. Water quality monitoring sites and weather station in Padilla Bay (from the Padilla Bay Management Plan).

APPENDIX 5: BRIEF HISTORY OF MPAS IN WASHINGTON

In the early 1990s MPAs gained significant attention as a promising management strategy in Washington. In response to growing cross-border environmental concerns, Washington Governor Mike Lowry and British Columbia Premier Mike Harcourt created the Environmental Coordinating Council in 1992. The next year, the Washington and British Columbia governments formed an International Task Force (the Task Force) to address primarily water quality issues in the Georgia Basin and Puget Sound. A group of scientists from both sides of the BC/WA border called the Marine Science Panel released a report in 1994 including a series of prioritized recommendation on marine resource issues in a report to the Task Force. The Marine Science Panel's second highest priority out of seven was to establish marine protected areas.

In order to carry out this recommendation, a multi-agency group, called the MPA Work Group, formed in 1995. In 1998, the MPA Work Group produced a draft strategy to establish MPAs using an interagency effort to design and implement a network of MPAs in Washington through the Puget Sound Ambient Monitoring Program. The strategy included a MPA policy for Washington, MPA site evaluation by policy and technical committees, tribal, public and local government involvement, use of the precautionary approach, and effectiveness outcome and adaptive management. Although the strategy was never finalized, in 1998 the Washington Fish and Wildlife Commission approved a policy confirming "MPAs as one of the agency's working tools for resource protection and management."[11]

In 2000, President Clinton's Executive Order 13158 defined the term *marine protected area*, called for establishment of a national system of MPAs, and created the National MPA Center within the National Oceanic and Atmospheric Administration to, in partnership with the Department of Interior, facilitate the effective use of science, technology, training, and information in the planning, management, and evaluation of the national system. A MPA Federal Advisory Committee was created in 2003 with Washington representation.

In their 2000 Puget Sound Water Quality Monitoring Plan, the Puget Sound Action Team (PSAT) included a plan to coordinate agencies and tribal governments in identifying candidate sites using a science-based process, identifying considerations for MPA siting, development of a comprehensive management strategy to support a network of MPA, inclusion of educational elements and site-specific goals and objectives, and the acknowledgement of tribal treaty rights. In their 2001-2003 Water Quality Work Plan, the PSAT highlighted a commitment to work with agencies, tribes, and NGOs, to develop criteria and standards for MPAs, coordinate research efforts, identify gaps in marine protection, and designate MPAs. In 2002, the Department of Natural Resources (DNR) established the Aquatic Reserves Program to promote preservation, restoration, and enhancement of state-owned aquatic lands. See Appendix 1 for more detail on MPA programs and authorities. In their 2003-2005 Puget Sound Water Quality Work Plan, the PSAT prioritized WDNR and WDFW's collaboration on MPA monitoring evaluation as well as the development of criteria and standards for MPAs, coordination of MPA research efforts, marine protection gap analysis, and designation of new MPAs.

[11] Fish and Wildlife Commission Policy Decision on Marine Protected Areas, POL-C3013, effective June 13, 1998.

On behalf of the Northwest treaty tribes, in 2003, the Northwest Indian Fisheries Commission issued a policy statement outlining tribal views, concerns, and guiding principles regarding MPA establishment (Appendix 2). In the same year, a draft inventory and habitat analysis of existing MPAs was created by the PSAT and a MPA science group was formed and coordinated by the SeaDoc Society and PSAT. The science group was disbanded after a year.

In 2003 and 2004, respectively, the Pew Ocean Commission and the U.S. Commission on Ocean Policy released their reports both including recommendations on MPA design and implementation (Pew Ocean Commission 2003 and U.S. Commission on Ocean Policy 2004). In 2004, the Seattle Aquarium hosted a two-day workshop on MPAs with the National MPA Center. The Northwest Straits Commission also convened the first of several MPA managers' workshops in the San Juan Islands for the purpose of coordinating MPAs and their managers for improved protection, monitoring and research, and management approaches. The next year, the Northwest Straits Commission finalized an MPA inventory, and conducted an "effectiveness analysis" on existing MPAs in north Puget Sound. Recommendations from the study include evaluation of protection efficacy of existing MPAs before establishment of new sites, improving the efficacy of existing sites, and the importance of coordinating sites in a network (Broadhurst 2005).

In 2007, the National MPA Center completed an inventory of MPAs including sites in Washington. The National MPA Center is currently developing a national system of MPAs in order to enhance protection and stewardship of marine resources, build partnerships and encourage coordination, and identify conservation gaps in current MPAs. In 2009, following the National MPA Center's request for nominations, 18 Washington MPAs were included in the National System of MPAs.

Like the Puget Sound Action Team before them, the Puget Sound Partnership recognizes MPAs to be a potentially useful ecosystem recovery and management tool. In 2008 the Puget Sound Partnership published their Puget Sound Action Agenda identifying "*protect intact ecosystem processes, structures, and functions"* as a priority action. A specific task identified under this priority is to *"implement a strategic network of Marine Managed Areas and Aquatic Reserves that contributes to conserving the biological diversity and ecosystem health in the marine areas of Puget Sound".* An associated near-term action is to:

Work with the Marine Managed Areas Work Group chaired by Washington State Department of Fish and Wildlife (DFW) to develop recommendations to improve the effectiveness of Marine Protected Areas (MPAs) by December 2009. Incorporate recommendations for MPAs in Puget Sound into the Action Agenda and take a lead role in implementation. In consultation with the tribes and other stakeholders, complete the management plans for the Cherry Point Aquatic Reserve and develop management plans for the following nominated reserves: Nisqually Estuary, Protection Island, and Smith Island in the Strait of Juan de Fuca. Implement recommendations. Coordinate the Cherry Point Management Plan with Whatcom County Cherry Point Management Area policies. Implement existing MPA plans in coordination with the Action Agenda. (Puget Sound Partnership 2008, p. 32-35)

In coordination with the MPA Work Group, the Puget Sound Partnership is currently developing a strategy to address ecosystem threats and achieve ecosystem targets which might include MPAs.

APPENDIX 6: MPA WORK GROUP RECOMMENDATIONS

No.	*Recommendation*	*Legislative Action? (Y/N)*	*Implementation Lead*
I. Coordination and Consistency			
1.	Promote coordination between tribes, state and federal agencies, and local jurisdictions in Puget Sound and on the coast relative to existing MPAs and future MPA planning efforts with dedicated support for coordination.	Y	PSP, DNR, WDFW, ECY*
A. Goals			
2.	MPAs should address a documented conservation concern through clear goals and objectives and performance evaluation	N	Managing agencies
B. Establishment Criteria			
3.	Agencies should link their respective processes for consideration of new MPAs and should use one or more existing MPA authorities to address conservation needs.	N	WDFW, DNR
4.	Coordinated by the MPA Work Group, MPA managing agencies should develop common criteria and a process for evaluating MPAs.	N	MPAWG
C. Management Practices			
5.	Provide adequate funding for MPA designation, management, and monitoring.	Y	Legislature
D. Terminology			
6.	Promote consistent use of MPA-related terms among state MPAs and between state and federal MPAs where possible. Where necessary, change state laws and regulations to reflect a consistent set of terms across multiple agencies.	Y	Legislature
E. Monitoring Practices			
7.	Inventory and evaluate current monitoring activities and identify overlaps and critical gaps in monitoring activities. Key monitoring activities should address a range of necessary management targets, including socioeconomic targets, where appropriate.	N	Managing agencies
8.	Promote consistent management and sharing of monitoring data and maximize benefits of monitoring efforts by leveraging funding through formal agency partnerships.	N	Managing agencies
9.	Target monitoring towards identified management goals, objectives, and threats in an ecosystem context and, where possible, coordinate monitoring of common threats across MPAs.	N	Managing agencies
II. Improved Integration			
A. Science			
10.	Conduct a Puget Sound and coast-wide marine conservation needs assessment and gap analysis of existing MPAs and provide recommendations for action	Y	MPAWG
11.	Use other ecosystem-based management tools to inform MPA management and establishment	N	Managing agencies
B. Local Governments and NGOs			
12.	Consider using Marine Stewardship Areas to engage local	N	Managing

	governments and NGOs in developing MPA proposals		agencies
III. Improving Effectiveness			
13.	Use the tribal MPA policy developed by the tribes of the Northwest Indian Fisheries Commission in 2003 as a starting point from which to evaluate the effectiveness of MPAs.	N	PSP
A. MPA Networks in Puget Sound			
14.	Implement a comprehensive process to evaluate the effectiveness of existing MPAs using the tribal MPA policy statement to determine what would be required to create networks of MPAs	N	PSP
B. Performance Evaluation			
15.	Use adaptive management to optimize efficiency and effectiveness of individual MPAs and MPA networks.	N	Managing agencies
16.	Identify and monitor reference sites in order to evaluate MPA effectiveness	Y	Managing agencies
17.	Promote consistent area-based marine conservation through alternatives to MPAs	N	Managing agencies

*PSP (Puget Sound Partnership), WDFW (Washington Department of Fish and Wildlife), DNR (Washington Department of Natural Resources), ECY (Washington Department of Ecology), MPAWG (MPA Work Group)

Marine Protected Areas in Washington:

Recommendations of the Marine Protected Areas Work Group to the Washington State Legislature

F. Brie Van Cleve
Greg Bargmann
Michele Culver
The MPA Work Group

Washington Department of Fish and Wildlife
600 Capitol Way North
Olympia, Washington
98501

Cape Disappointment State Park