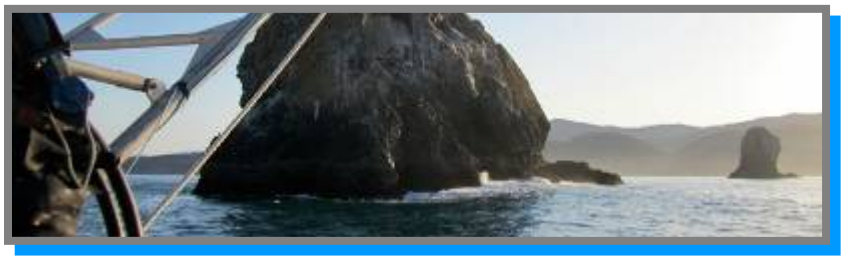
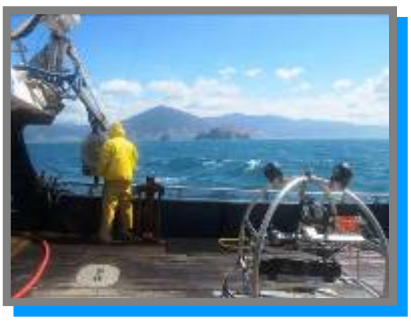
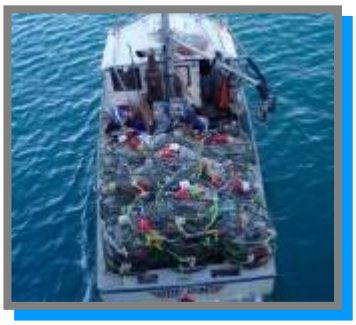
Redfish Rocks Marine Reserve

Site Management Plan







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Marine Resources Program
Newport, Oregon

Acknowledgments:

Many thanks to the Redfish Rocks Community Team including the biological, socioeconomic, outreach and education, and compliance and enforcement working groups. Additional thanks to all the individuals that donated their time and hard work, contributing to the development of the management strategies for the Redfish Rocks Marine Reserve site and this document.

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List of Acronyms & Abbreviations

DSL	Oregon Department of State Lands
MPA	Marine Protected Area
ODFW	Oregon Department of Fish and Wildlife
OPAC	Oregon Ocean Policy Advisory Council
Oregon State Police	Oregon Department of State Police
POORT	Port Orford Ocean Resource Team
Redfish Rocks site	Redfish Rocks Marine Reserve and Marine Protected Area
RFP	Request for Proposals
RRCT	Redfish Rocks Community Team
USFWS	U.S. Fish and Wildlife Service

Introduction

In 2008, the state of Oregon began a process to establish a limited system of marine reserve sites within state waters. In 2009, the state's first two sites were established: Redfish Rocks Marine Reserve and Marine Protected Area located on Oregon's south coast near Port Orford, and Otter Rock Marine Reserve located on Oregon's central coast near Depoe Bay.

The Oregon Department of Fish and Wildlife (ODFW) is the designated lead agency responsible for implementation of Oregon's system of marine reserve sites. To that effect, in 2009 ODFW established a program comprised of staff responsible for developing and implementing site management plans, ecological monitoring, human dimensions (socioeconomic) monitoring, outreach activities, and community engagement as part of marine reserves implementation.

The *Redfish Rocks Marine Reserve Site Management Plan* was developed by ODFW staff with assistance and collaboration from the Redfish Rocks Community Team. This document describes the state's implementation goals, objectives, and strategies for the Redfish Rocks Marine Reserve and Marine Protected Area (Redfish Rocks site).

A. Management Plan Purpose and Contents

The purpose of this site management plan is to: a) describe the state policies that direct and guide the implementation of Oregon's marine reserves, b) document the state and community implementation priorities for the Redfish Rocks site, and c) provide a course of action for state agency implementation efforts. The plan details the state's implementation strategies developed for ecological and human dimensions monitoring, reporting, and evaluation; outreach; compliance and enforcement; and management strategies pertaining to disturbance issues. The plan also provides for how the local community engages and collaborates in state implementation efforts and describes the local community's priorities and implementation efforts for Redfish Rocks that complement that of the state.

We hope that by documenting these priorities and strategies we will spur support for, and engagement in, implementation efforts and attract complementary actions conducted by external entities to further assist with implementation of the Redfish Rocks site. As implementation will evolve over time, the *Redfish Rocks Marine Reserve Site Management Plan* will be reviewed and updated every five years, with assistance and collaboration from the local community.

Policies
Oregon's Marine Reserves

This chapter gives an overview of the state policies that direct and guide the siting, development, and implementation of Oregon's limited system of marine reserve sites. This site management plan sets the state's priorities and directs actions towards implementing these policies for the Redfish Rocks Marine Reserve and Marine Protected Area.

A. Legislation, Rules, and Policy Guidance

A.1 Marine Reserves Legislation

Oregon Revised Statutes, 196.540 through 196.555, establish requirements and provide direction with regards to the siting, development, and implementation of Oregon's limited system of marine reserve sites.

A.2 Oregon Administrative Rules

Marine reserve sites are established and governed by state agency administrative rules. To establish a marine reserve site, three primary state agencies are responsible for adopting administrative rules:

1. **Department of State Lands -** Rules establish site boundaries and regulate submerged and submersible land uses that require state authorization or a removal-fill permit (including harvest of subtidal kelp).
2. **Department of Fish and Wildlife -** Rules regulate fishing, hunting, and take of fish, invertebrate, and wildlife species within a site.
3. **Parks and Recreation Department -** Rules regulate extraction of living (i.e., seaweed) and non-living natural products, and disruptive activities, within rocky intertidal portions of a site.

A.3 Ocean Policy Advisory Council (OPAC)

The Oregon Ocean Policy Advisory Council (OPAC) is a legislatively mandated body that advises the Governor, state agencies, and local governments on marine resource policy issues. Further guidance pertaining to siting, development, and implementation of marine reserve sites is provided in the "Oregon Marine Reserve Policy Recommendations" developed and approved by OPAC in 2008. Key definitions, goals, and objectives provided by OPAC that guide management of Oregon's marine reserve sites and lead development of this site management plan are described in the sections that follow.

B. Definition of Marine Reserve

As established in the OPAC policy recommendations, Oregon defines a marine reserve as:

> . . . an area within Oregon's Territorial Sea or adjacent rocky intertidal area that is protected from all extractive activities, including the removal or disturbance of living and non-living marine resources, except as necessary for monitoring or research to evaluate reserve condition, effectiveness, or impact of stressors. (OPAC 2008)

C. Marine Protected Areas

Marine Protected Areas (MPAs), that allow or prohibit certain specified extractive activities, are also included as part of Oregon's limited system of marine reserve sites. As established in the OPAC policy recommendations, Oregon defines an MPA as:

> 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. (OPAC 2008, adopted from Presidential Executive Order 13158 issued May 26, 2000).

The allowed and prohibited extractive activities of each MPA site are defined in agency administrative rules.

D. Goal and Objectives

The implementation strategies for the Redfish Rocks Marine Reserve site, outlined in this management plan, have been developed to meet the goal and objectives of Oregon's marine reserves, as established by OPAC in 2008.

D.1 Marine Reserve Goal

Oregon's goal for marine reserves is to:

> Protect and sustain a system of fewer than ten marine reserves in Oregon's Territorial Sea to conserve marine habitats and biodiversity; provide a framework for scientific research and effectiveness monitoring; and avoid significant adverse social and economic impacts on ocean users and coastal communities.
>
> A system is a collection of individual sites that are representative of marine habitats and that are ecologically significant when taken as a whole. (OPAC 2008)

D.2 Marine Reserve Objectives

Marine reserve objectives further guide the siting, development, and implementation of Oregon's marine reserves (OPAC 2008):

1. Protect areas within Oregon's Territorial Sea that are important to the natural diversity and abundance of marine organisms, including areas of high biodiversity and special natural features.
2. Protect key types of marine habitat in multiple locations along the coast to enhance resilience of nearshore ecosystems to natural and human-caused effects.
3. Site fewer than ten marine reserves and design the system in ways that are compatible with the needs of ocean users and coastal communities. These marine reserves, individually or collectively, are to be large enough to allow scientific evaluation of ecological effects, but small enough to avoid significant adverse social and economic impacts on ocean users and coastal communities.
4. Use the marine reserves as reference areas for conducting ongoing research and monitoring of reserve condition, effectiveness, and the effects of natural and human-induced stressors. Use the research and monitoring information in support of nearshore resource management and adaptive management of marine reserves.
5. Although marine reserves are intended to provide lasting protection, individual sites may, through adaptive management and public process, later be altered, moved, or removed from the system, based on monitoring and reevaluation at least every five years.

E. Planning Principles and Guidelines

Additional guidance is provided by means of planning principles and guidelines provided in the OPAC policy recommendations (OPAC 2008):

1. The public, including ocean users, coastal communities and other stakeholders, will be involved in the proposal, selection, regulation, monitoring, compliance and enforcement of marine reserves.
2. Outreach and public engagement will be an ongoing part of the marine reserves planning and implementation process. Available scientific and other information will be made available to the public through outreach and websites.
3. Science and local knowledge will be used in the planning process for marine reserves. Such information will also be used to monitor and adaptively manage them into the future.
4. The planning process will encourage coordinated and collaborative marine reserve proposals from communities of place or interest. Communities of place may include coastal counties, cities, and ports; communities of interest may include fishing organizations, fishery/gear groups, governmental and inter-governmental organizations, and non-governmental organizations. Priority consideration will be given to proposals developed by groups comprised of coastal community members, ocean users and other interested parties.
5. The design and siting of marine reserves will take into account the existing regulatory regimes (e.g., fisheries management, ocean shore management, watershed management, land use planning, and water quality regulations) along with existing and emerging uses such as buried cables, ocean outfalls, wave energy, and proximity to ports.
6. Size and spacing guidelines developed by the Science and Technical Advisory Committee (STAC) will be used to help understand potential ecological benefits of

marine reserve site proposals, rather than dictate minimums or maximums needed. The potential for adverse social and economic impacts will also be a key factor on the size and spacing of reserves recommended by OPAC for further evaluation.

F. Implementation Principles and Guidelines

Further guidance is given by means of implementation principles and guidelines provided in the OPAC policy recommendations (OPAC 2008):

1. Marine reserves as a system and each individual marine reserve will have a plan that includes clearly defined objectives, monitoring protocols, compliance and enforcement provisions, effective management measures, and a commitment of long-term funding necessary to achieve its goals.
2. Marine reserves will be adequately enforced.
3. Marine reserves will be adequately monitored and evaluated in support of adaptive management. Cooperative and collaborative research will be encouraged as well as utilization of fishing vessels as research platforms. These activities will be compatible with the goal of conserving marine habitats and biodiversity.
4. Education and economic development opportunities that are compatible with the goal of conserving marine habitats and biodiversity will be encouraged.
5. Marine reserves are not intended to prevent marine transit, safe harbor, and beach access.
6. Significant adverse social and economic impacts of marine reserves on ocean users and coastal communities will be avoided and positive social and economic effects will be sought.
7. Adequate baseline data will be collected at each site prior to excluding extractive activities. The types and adequacy of baseline data, and the timing and methods of data collection will be driven by the research and monitoring objectives and sampling designs employed at each site.

Implementation
Oregon's Marine Reserves

This chapter provides an explanation of how the OPAC goal and objectives, and the planning and implementation principles and guidelines, relate to implementation of Oregon's marine reserve sites. The chapter presents an overview of the major steps in implementation: how marine reserves are used, when and how implementation is reviewed, when and how marine reserves are evaluated, and how sites are adaptively managed.

A. How We Use Marine Reserves

The OPAC marine reserve goal and objectives (Chapter II, section D) direct the state to use marine reserves to conserve marine habitats and biodiversity and to use the reserves as reference areas for conducting ongoing research and monitoring of reserve condition, effectiveness, and the effects of natural and human-induced stressors. Use of marine reserves as reference areas is implemented through the state's monitoring activities. The information gathered from ecological and human dimensions monitoring efforts will be used in support of nearshore resource management in general and in the adaptive management of marine reserves.

Ecological and human dimensions data collected over the first two years, prior to the prohibition of extractive activities taking effect, will be used to establish a baseline and the beginning point of the long term monitoring of a site. Detailed methods, analyses, and results from monitoring of marine reserve sites will be presented in biennial monitoring reports. Ecological and human dimensions baseline monitoring reports, for the Redfish Rocks and Otter Rock sites, will be available in the spring of 2012.

B. Implementation Review

A review of site implementation and updates to the Redfish Rocks Marine Reserve Site Management Plan is to be conducted every five years, with assistance from community members. The OPAC planning and implementation principles and guidelines (Chapter II, sections E and F) will be used as a guide to review implementation efforts. Focus will be on the progress made implementing the strategies outlined in this site management plan for:

1. Ecological and human dimensions monitoring
2. Outreach
3. Compliance and enforcement
4. Public and community engagement

Implementation review may trigger adaptations to strategies and updates to the site management plan in order to better meet the OPAC planning and implementation principles and guidelines. Any adaptations to implementation being considered will include consultation with, and general support from, the Redfish Rocks Community Team (RRCT).

C. Marine Reserves Evaluation

A comprehensive evaluation of the Redfish Rocks site and limited-system of reserves is to be conducted after the system has been in place for a minimum of 10-15 years after the prohibition of extractive activities have taken effect. This period will allow time for adequate ecological, social, and economic data to be collected through monitoring and for the detection of ecological responses to begin. The evaluation will focus on if, where, and to what degree each marine reserve site and the system as a whole are meeting the OPAC marine reserve goal and objectives (Chapter II, section D). The evaluation will provide information so the state can determine if and how marine reserves should continue to be used as a nearshore resource management tool in the future.

To assist the state's evaluation of the Redfish Rocks site and the limited-system as a whole, ODFW's long-term monitoring is designed to address the following aspects of marine reserves evaluation:

1. Determine the effectiveness of marine reserves in conserving certain species, habitats, biodiversity or certain aspects of the ecosystem.
2. Determine if marine reserves serve as ecological reference areas which allow us to deduce natural from human-induced changes to certain species, habitats, or certain aspects of the ecosystem and measure these changes over time.
3. Determine if marine reserves increase our knowledge of Oregon's nearshore environment, resources, and uses. Use this information to support nearshore resource management.
4. Determine if size, configuration, location and prohibitions of marine reserve sites and associated marine protected areas, and the system as a whole, allow scientific evaluation of ecological effects.
5. Determine if size, configuration, location and prohibitions of marine reserve sites and associated marine protected areas, and the system as a whole, avoid significant adverse social and economic impacts to ocean users and coastal communities.

D. Adaptive Management

Based on the marine reserves evaluation, adaptations to management or the site(s) may be considered, but only after adequate time for thorough evaluation of ecological, social, and economic effects. Changes to site boundaries or prohibitions are unlikely to be considered until after 10 to 15 years of study. Any adaptive management considerations of the Redfish Rocks site will include consultation with, and general support from, the RRCT. Consensus will be sought through the community team prior to any alteration of site boundaries or prohibitions/allowances within the site. If consensus cannot be reached, it will be clearly stated to the appropriate board or commission (e.g. Fish and Wildlife Commission, State Land Board, Parks Commission) considering changes and all parties will have the opportunity to voice their positions individually.

Redfish Rocks Marine Reserve and MPA

A. Background

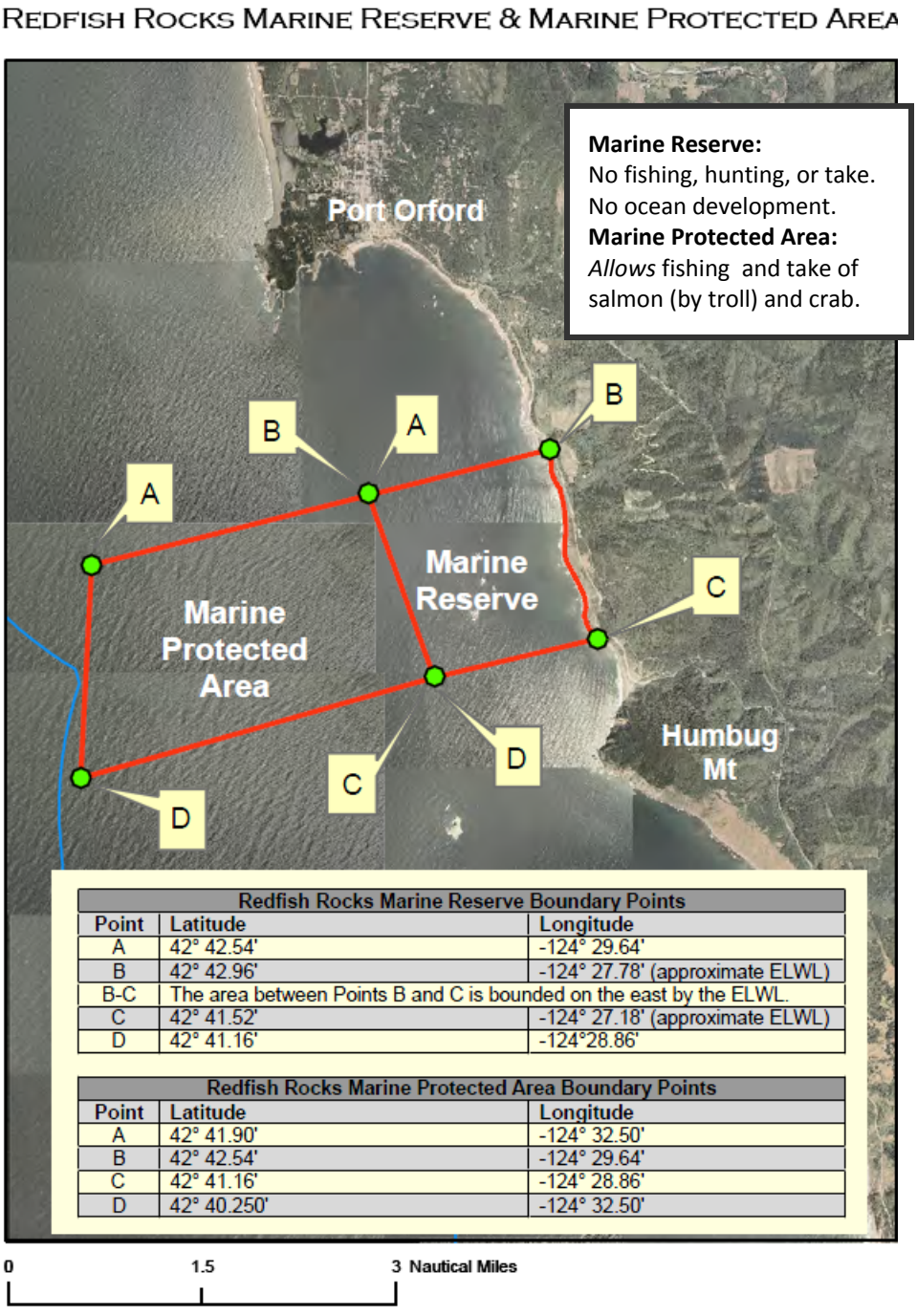
A.1 Site Description

The Redfish Rocks site (Figure 1) is located off the southern coast of Oregon between Rocky Point and Coal Point, just south of the city of Port Orford in Curry County.

The site starts at the Extreme Low Water Line (ELWL), with a marine reserve covering approximately 2.6 square miles. The site also includes an adjacent complementary marine protected area (MPA), extending westward towards the Territorial Sea boundary, covering another approximately 5.8 square miles. The boundary coordinates for the marine reserve and MPA are provided in Figure 1.

A.2 Designation History

The Redfish Rocks site was originally proposed in 2008 by the Port Orford Ocean Resource Team (POORT), for consideration by OPAC as part of a public marine reserve proposal process. POORT is a non-profit organization directed by a board of five Port Orford commercial fishermen. The mission of POORT is: "To ensure the long-term sustainability of Port Orford's ocean resources and our community that depends on them by uniting science, education, local expertise and conservation" (POORT 2011).



Redfish Rocks Marine Reserve Boundary Points		
Point	Latitude	Longitude
A	42° 42.54'	-124° 29.64'
B	42° 42.96'	-124° 27.78' (approximate ELWL)
B-C	The area between Points B and C is bounded on the east by the ELWL.	
C	42° 41.52'	-124° 27.18' (approximate ELWL)
D	42° 41.16'	-124°28.86'

Redfish Rocks Marine Protected Area Boundary Points		
Point	Latitude	Longitude
A	42° 41.90'	-124° 32.50'
B	42° 42.54'	-124° 29.64'
C	42° 41.16'	-124° 28.86'
D	42° 40.250'	-124° 32.50'

Figure 1. Redfish Rocks Marine Reserve Site

In November 2008, OPAC forwarded marine reserve recommendations to Governor Kulongoski including a recommendation that the Redfish Rocks site move forward for implementation. In 2009, the Oregon Legislature adopted marine reserves legislation directing state agencies to adopt rules to establish, study, monitor, evaluate and enforce the Redfish Rocks site. In December 2009 and January 2010, state agencies adopted administrative rules establishing the Redfish Rocks site and implementation was begun starting with the development of monitoring plans, collection of baseline data, and development of a site management plan. The Department of State Lands rules, establishing the site boundaries and regulating submerged and submersible land uses that require state authorization or a removal-fill permit, were effective starting in December 2009. The ODFW rules for fishing, hunting, and take within the site became effective on January 1, 2012, providing for two years ecological and human dimensions baseline data to be collected prior to cessation of extractive activities. For more information on ecological and human dimensions monitoring of the Redfish Rocks site, see Chapter V.

A.2.a. Focus of protections

The Redfish Rocks site was proposed by POORT to meet the state's established marine reserve goal. More specifically, the marine reserve portion of the site was proposed to protect those species whose home range is centered on the Redfish Rocks reef complex. The MPA portion of the site, which stretches out from the western boundary of the marine reserve towards the boundary of the Territorial Sea, was proposed to provide additional protection for those species that have larger home ranges, that seasonally migrate, or migrate to and from deeper waters as a part of their life history cycle.

B. Marine Environment

This section provides an overview of the nearshore marine environment in the vicinity of Port Orford and the Redfish Rocks site specifically. Long-term ecological monitoring at the Redfish Rocks site will provide us with more details about the marine environment in this area over time. More information on ecological monitoring can be found in Chapter V, section A.

B.1 Nearshore Oceanography

The Redfish Rocks site and nearshore waters surrounding the Port Orford area are a unique part of the Northern California Current Ecosystem (NCCE). The NCCE ranges from Cape Mendocino, in northern California to Vancouver Island, British Columbia. The onshore North Pacific Current crosses the Pacific from Japan to Canada and splits into northward and southward flowing currents. The southward flowing current which dominates the NCCE is called the California Current. Strongest in the summer over the continental shelf, this current weakens and is displaced by the northward flowing Davidson current associated with winter storms. Cape Blanco, just to the north of Redfish Rocks, is considered to be a dividing point between a distinct northern region from Cape Blanco to the Columbia River at the Oregon-Washington border and a southern region that extends from Cape Blanco to Cape Mendocino in California. In many respects, the cold water temperatures, ocean conditions, and the biological communities within the Redfish Rocks vicinity are similar to those of northern California (Lamb and Handby 2005). South of Cape Blanco strong persistent winds create upwelling, producing nutrient rich waters that support high productivity in the vicinity of Port Orford.

B.2 Nearshore Geology and Habitat

The Redfish Rocks site and adjacent nearshore areas in the vicinity of Port Orford are part of a complex of temperate water rocky reefs. The area includes emergent rocks and islands, rocky and sandy intertidal areas, kelp beds, flat and rugose hard bottom reef complexes, and areas of unconsolidated soft bottom.

The area around Port Orford can be roughly divided into three segments, each segment bounded or divided by capes and headlands.

The first segment is between Cape Blanco and Tichenor Head. This segment includes subtidal rocky reefs, emergent rocks, and islands associated with Orford Reef and McKenzie Reef . Orford Reef consists of relics of a Pleistocene headland of the Otter Point Formation (Miller 1991).

The second segment is from Tichenor Head to Humbug Mountain. This segment includes other reef complexes including the reef at Redfish Rocks. These reefs are part of the same Pleistocene relics of the Otter Point Formation and Rocky Point Formation from the early Cretaceous period. The latter formation is composed of graded hard sandstone and moderately hard siltstone.

The third segment is from Humbug Mountain south. Humbug Mountain is a large structure different from the Otter Point Formation and is composed of conglomerates and sandstone. Erosion of Humbug Mountain likely contributes to rocks and boulders making up the inshore reef areas at the mountain's base.

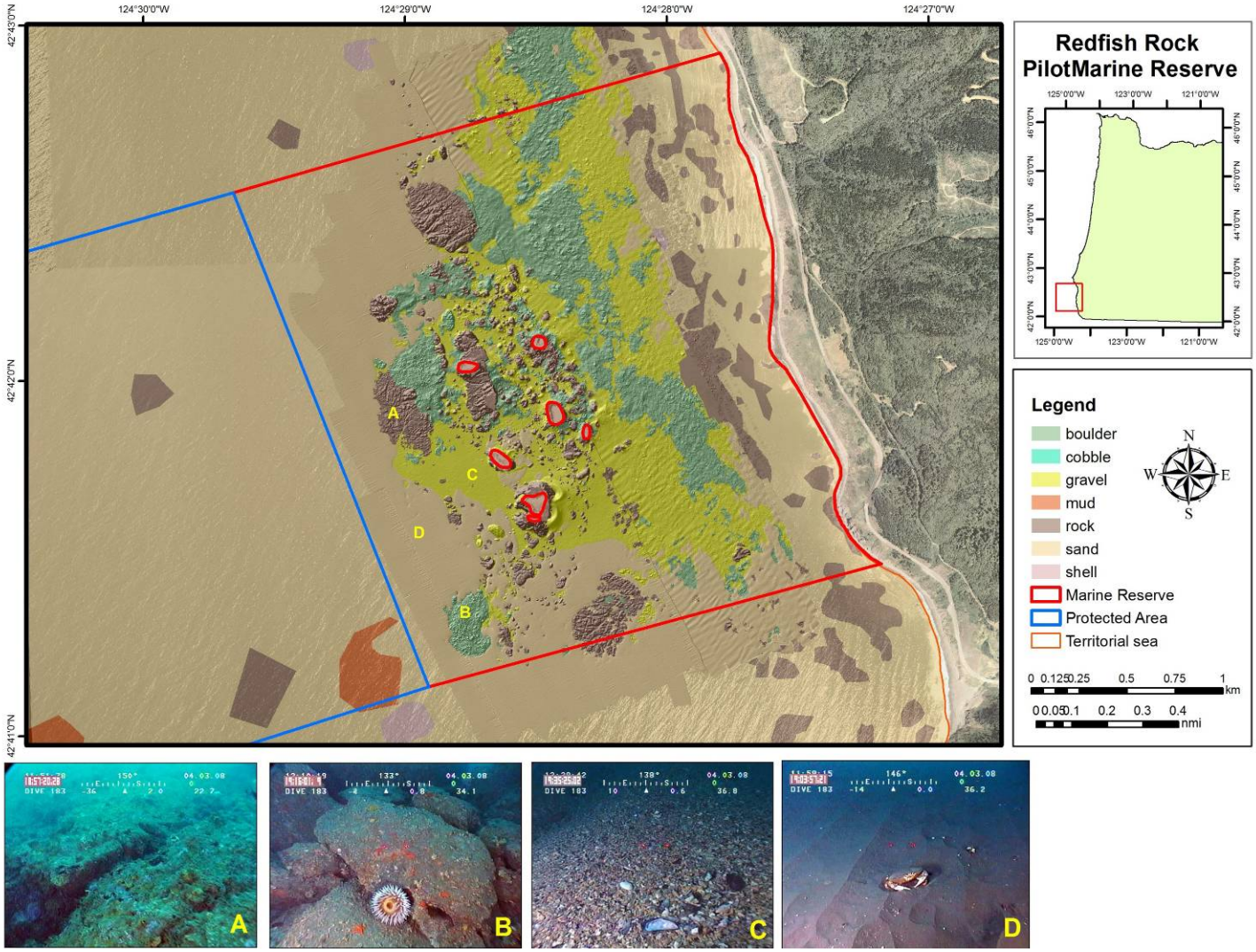


Figure 2. Map and examples of substrate types within the Redfish Rocks marine reserve (Amolo 2010)

Intertidal characteristics of the Port Orford area include extensive rocky intertidal areas interspersed with short sandy beaches. The overall complexity of this area contributes to a high species diversity and abundance of fish, invertebrates, and algae. It is also an important pupping and haulout area for Steller sea lions and feeding area for gray whales. The many rocks, islands, and headlands are home for many species of seabirds.

B.2.a Redfish Rocks site

The Redfish Rocks site is located between Tichenor Head and Humbug Mountain. Depth at the Redfish Rocks site ranges from the extreme low tide line to a depth of 80 meters (approximately 45 fathoms). The marine reserve portion of the site encompasses the Redfish Rocks reef complex, featuring emergent rocks and islands surrounded by high relief rocky reef and bedrock interspersed with cobble beds and boulder fields. The inside subtidal reaches, between the islands and the shoreline, support extensive kelp beds. These shallower rocky subtidal areas are subject to seasonal sand inundation events though they still support kelp beds (Golden, personal observation). Figure 2 provides a map of the different substrate types found in the marine reserve portion of the site. The MPA, west of the reef, is dominated by large stretches of sand broken up by rock structures of varying size.

C. Cultural and Human Uses

The Redfish Rocks site is located south of the town of Port Orford. The Port Orford area was first inhabited by the Native American Qua-to-mah tribe, of the Tututni peoples who inhabited areas throughout the southern Oregon coast and lower Rogue River. Captain William Tichenor brought the first European settlers in 1851, and the town of Port Orford was formally founded in 1856 and incorporated in 1935. Port Orford is the oldest town on the Oregon coast. Fishing and timber were historically important industries, with Port Orford still supporting an active commercial fishing fleet and forest industry. The natural harbor at the north end of Port Orford Bay has a "dolly dock" where boats are lifted in and out of the water by cranes and parked on large trailers on the dock (City of Port Orford 2011). The Port of Port Orford is home to approximately 30 commercial fishing boats. The current population of Port Orford is 1,133 people (2010 Census).

The nearshore waters surrounding Port Orford support many forms of consumptive and non-consumptive activities. Commercial fishing is a well established use. Members of the Port Orford commercial fishing fleet, as well as boats hailing from other ports along the west coast, fish these nearshore waters targeting mainly nearshore groundfish, sea urchin, crab, and salmon. Recreational private boats use this area to target mainly groundfish. Charter boat fishing occurs opportunistically during certain seasons and certain types of weather. Fishing from kayaks, spear fishing, and clamming are also common uses. Non-consumptive uses include agate hunting on beaches; SCUBA diving; wildlife viewing; water sports including surfing, windsurfing, and kayaking; and general beach use.

Long-term human dimensions monitoring will provide us with more detailed descriptions of the communities of interest and place that are associated with the Redfish Rocks site. Monitoring will also provide us with a better understanding of the consumptive and non-consumptive users of the Redfish Rocks site and the general surrounding area including: what the uses are, the level of use, and how this use changes over time. More information on human dimensions monitoring can be found in Chapter V, section B.

Monitoring

Monitoring serves two purposes in the implementation of Oregon's marine reserves. First, to implement specific aspects of the marine reserve goal (i.e. provide a framework for research and monitoring) and objectives (i.e. serve as reference areas). Second, to gather information needed for evaluation of marine reserves; to understand over time if, where, and to what degree marine reserve sites and the system as a whole are meeting the marine reserve goal and objectives established by OPAC. The following sections provide the ecological and human dimensions monitoring strategies for Oregon's limited system of marine reserves developed to meet these two purposes.

A. Ecological

The ecological monitoring research questions, metrics, field sampling activities, and data analyses are designed to derive the necessary ecological information needed for marine reserves evaluation and to support nearshore resource management in general.

The OPAC policy recommendations, described in Chapter II of this management plan, provide three main themes that drive the design and execution of ODFW's ecological monitoring:

- Using marine reserves as a tool to protect species, habitats, and biodiversity.
- Using marine reserves as a reference area to deduce natural from human-induced changes in the environment.
- Evaluating the effectiveness of marine reserves as a management tool to achieve the protection and reference area purposes listed above.

Using marine reserves as reference areas and evaluating reserve effectiveness requires monitoring that:

- Examines species and habitats to determine change or variation over time.
- Compares the marine reserve area with similar areas that are not in protected status to see if changes differ over time between the sites.

ODFW's long-term ecological monitoring is designed to address the following aspects of the marine reserves evaluation:

- Determine the effectiveness of marine reserves in conserving certain species, habitats, biodiversity or certain aspects of the ecosystem.
- Determine if marine reserves serve as ecological reference areas which allow us to deduce natural from human-induced changes to certain species, habitats, or certain aspects of the ecosystem and measure these changes over time.

- Determine if marine reserves increase our knowledge of Oregon's nearshore environment and resources. Use this information to support nearshore resource management.
- Determine if size, configuration, location and prohibitions of marine reserve sites and associated marine protected areas, and the system as a whole, allow scientific evaluation of ecological effects.

A.1 Monitoring Plan

ODFW staff, with assistance and collaboration from external scientists and members of the Redfish Rocks Community Team, drafted the *Oregon Marine Reserves Ecological Monitoring Plan* (Appendix A) designed for the long-term monitoring of Oregon's limited system of marine reserve sites. The monitoring plan documents and describes the research questions, sampling design, metrics, sampling activities, and data analyses that are a part of the ecological monitoring conducted at Redfish Rocks and other sites that comprise Oregon's system of marine reserves.

A.1.a. Research questions

ODFW's ecological monitoring efforts are focused on answering the following research questions:

1. What is the oceanographic condition of each site? How does it change over time?
2. What habitats exist within each site? How do they change over time?
3. What algal, invertebrate, and fish species exist at each site?
    a. How do species biometrics change over time?
    b. How does biodiversity change over time?
4. What are the species-habitat correlations at each site? How do they change over time?
5. Does the prohibition of extractive activities change the community structure of the reserve?
6. Are patterns or changes within the marine reserve consistent throughout the marine reserve system?

A.1.b. Monitoring scheme

Monitoring is designed to sample in space, over time, and both within and outside of the Redfish Rocks site.

Comparison Areas. Two of the core components of marine reserve monitoring are separating natural changes in species and habitats from human-caused changes, and determining if marine reserves are effective in conserving certain species and habitats. To accomplish this, the Redfish Rocks site needs to be compared before and after protective measures are put in place, and with areas that do not have the marine reserve protections. Over the past couple decades this has been the approach of choice for scientifically rigorous and defensible studies for differentiating natural from human-caused changes within an area and has been applied to marine reserve monitoring elsewhere in the world (Michelie et al. 2004). Each marine reserve site is therefore paired to other areas referred to as comparison areas (i.e. scientific controls) to be monitored alongside the marine reserve.

Comparison areas are chosen based on similarities in habitat, depth, species, oceanography, and fishing pressure to that of the marine reserve site. ODFW staff worked with local Port Orford fishermen and researchers familiar with the area to identify comparison areas. Two comparison areas have been identified for Redfish Rocks, one at McKenzie Reef and a second at Humbug Mountain (Figure 3).

Sampling Approach. Sampling at the site and comparison areas is designed to:

1. Characterize the habitat, oceanographic condition, and species that exist at each site.
2. Determine whether or not the marine reserve (prohibition of extractive activities) changes the environment over time.
3. Determine which components of the environment are affected.
4. Estimate the magnitude of the effects.

The approaches to sampling include general site characterization, systematic rapid assessment, and detailed assessment. The general site characterization, systematic rapid assessment, and detailed assessment are conducted during the first two years, before the prohibition of extractive activities take effect, to generate a baseline for the site and comparison areas. The detailed assessment continues to be conducted over the long-term and occurs at the site and comparison areas both before and after the prohibition of extractive activities take effect. For the detailed assessment, sampling is divided between two bottom types: hard bottom and unconsolidated sediment. Each bottom type is stratified by depth and sampling is conducted randomly within each depth strata.

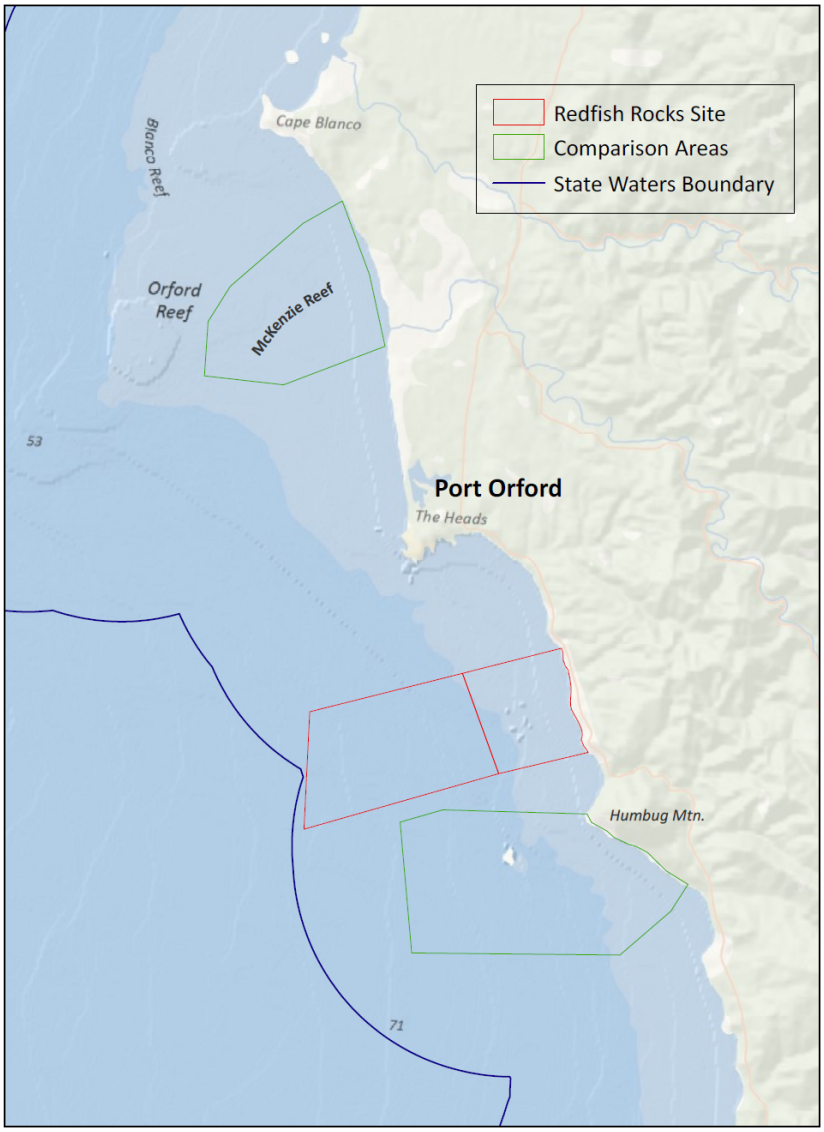


Figure 3. Redfish Rocks Marine Reserve and MPA and comparison areas at McKenzie Reef and Humbug Mountain.

Focal Species. While efforts are made to identify and enumerate all species sampled, sampling gear limitations and limited time, staff, and funds require that reporting and analysis focus on a select group of species for each marine reserve site. These focal species are chosen based on their ecological or economic importance and their potential to show a response, or change, to the marine reserve.

Sampling Tools and Methods. Sampling falls into four major categories: oceanographic assessment, seafloor mapping, visual surveys, and extractive surveys. Sampling tools and methods are chosen based

on their ability to sample within given bottom types and to derive specific metrics. The methods are integrated to collect a baseline/T_0 and long-term data set to generate algal, invertebrate, and fish species biometrics and to characterize the general ecology and oceanography of the site.

A.2 Reporting and Review

Detailed methods, analyses, and results from monitoring of the Redfish Rocks site and any additional sites within the limited-system are to be presented in biennial monitoring reports. The monitoring reports will be provided to the RRCT, OPAC, and posted on the state's marine reserves website for access by the public. Adaptations to monitoring are anticipated over time as more is learned from monitoring activities. An extensive review of monitoring activities and updates to the ecological monitoring plan is expected to be conducted every five years, with assistance from external scientists and community members.

A.3 Field Logistics

The majority of sampling is to be carried out between April and October, when the swell is smaller, for logistical and safety reasons. The degree of exposure to prevailing swell, currents, and winds affects the ability of researchers to access the site and comparison areas to conduct studies. The McKenzie Reef comparison area is less protected and separated by several miles of open ocean from the port of Port Orford. Boats transiting this area can be subject to winds and large swells in the summer. The marine reserve, MPA, and Humbug Mountain comparison area are closer to port and have more protection from the prevailing northwest wind and swell.

A.4 Procedures for Non-ODFW Researchers

Non-ODFW researchers interested in conducting work within the Redfish Rocks site are to review the procedures for scientific research outlined in Chapter VII, section C of this site management plan. In addition, researchers are to review the guidelines and best practices provided in Chapter VIII that have been established by the U.S. Fish and Wildlife Service to avoid or minimize human disturbance to wildlife using National Wildlife Refuge islands and rocks located within the Redfish Rocks site. Researchers are also encouraged to review the Oregon Marine Reserves Ecological Monitoring Plan (Appendix A) and to coordinate or collaborate with ODFW marine reserves staff on research efforts.

A.5 Community Engagement Strategies

Strategies, to be implemented by ODFW, for engaging the local community in ecological monitoring efforts have been developed in collaboration with the RRCT. These strategies are outlined below. Additional strategies are likely to be identified in the future and specific activities implemented with continued collaboration between ODFW and the RRCT. For information about the community of Port Orford's priorities and implementation efforts for biological science at the Redfish Rocks site, please see Chapter IX.

Use of Local Fishing Vessels. When and where feasible, ODFW will look to contract local fishing vessels for use as research platforms to conduct marine reserves research and monitoring work. Vessels are contracted through the state's open competitive bidding process. Request for Proposals (RFP) are posted on-line on the state's Oregon Procurement Information Network (ORPIN) system at: http://orpin.oregon.gov/open.dll/welcome. RRCT staff and members will assist in advertising any posted RFP, encouraging local vessel owners to submit bids and engage in monitoring activities.

Citizen Science. Volunteer opportunities may periodically be provided for volunteers to participate in ODFW led marine reserves research and monitoring activities. Opportunities will be announced to the RRCT. Community team staff and members may be asked to help advertise specific opportunities and

solicit volunteers. Volunteers must fill out an ODFW volunteer form before participating in any research or monitoring activity.

Currently, ODFW staff and funding resources are not available for the agency to lead development and implementation of dedicated citizen science projects. As the ODFW monitoring program matures and/or staff and funding resources evolve, opportunities may be explored to develop specific citizen science projects. For information on the community of Port Orford's interest in citizen science, see Chapter IX.

Monitoring Reporting & Feedback. Twice per year, in the spring and in the fall, ODFW will report on ecological monitoring activities at regularly scheduled RRCT meetings. All RRCT meetings are open to the public and outreach will be conducted to encourage public participation. The meetings will provide an opportunity for ODFW to share updates with the local community on monitoring activities, analyses, and results and provide a forum for discussion of upcoming planned monitoring activities and opportunities for community engagement. In conjunction with the spring reporting, in partnership with the RRCT, ODFW will host a workshop where community team members and the public can receive more detailed information on monitoring activities and provide feedback and input to ODFW staff.

Workshops with the local fishing fleet will be conducted in instances where ODFW is in need of local knowledge and feedback for developing new, or re-tooling existing, monitoring activities. ODFW will work with RRCT staff and members to advertise and solicit participation in any and all workshops.

Non-ODFW Research. External scientists conducting marine reserves related research in the Port Orford area are encouraged to work with the RRCT and to consider use of local vessels, volunteer opportunities, or citizen science projects as part of their work. They are also encouraged to share the results of their work with ODFW, the RRCT, and the Port Orford community. For external scientists looking for more information about any of the aforementioned, please contact ODFW program staff or RRCT staff.

B. Human Dimensions

Another key component of marine reserves implementation is monitoring of the human dimensions. Research questions, metrics, data collection methods, and data analyses are designed to derive the necessary social and economic information needed for marine reserves evaluation and to support nearshore resource management in general.

The OPAC policy recommendations, described in Chapter II of this management plan, provide several themes that drive the design and execution of ODFW's human dimensions monitoring:

- Using marine reserves in ways that are compatible with the needs of ocean users and coastal communities. Avoiding significant adverse social and economic impacts on ocean users and coastal communities.
- Using the marine reserves as reference areas for conducting ongoing research and monitoring. Using the research and monitoring information in support of nearshore resource management and adaptive management of marine reserves.
- Evaluating the effectiveness of marine reserves as a management tool that achieves the compatibility and reference area purposes listed above.

- Using marine reserves as reference areas and evaluating reserve effectiveness requires monitoring that examines direct and indirect social, cultural, and economic effects that are a result of the

marine reserve (i.e. prohibition of extractive activities) on ocean users and identified communities of interest and place.

ODFW's long-term human dimensions monitoring is designed to address the following aspects of the marine reserves evaluation:

- Determine if marine reserves increase our knowledge of Oregon's nearshore environment, resources, and uses. Ascertain if this information is being used to support nearshore resource management.
- Determine if size, configuration, location and prohibitions of marine reserve sites and associated marine protected areas, and the system as a whole, avoid significant adverse social and economic impacts to ocean users and coastal communities.

B.1 Monitoring Plan

ODFW staff, with assistance and collaboration from external scientists and members of the Redfish Rocks Community Team, drafted the *Human Dimensions Monitoring and Research* plan (Appendix B) designed for the long-term monitoring of Oregon's limited system of marine reserve sites. The monitoring plan documents and describes the objectives, sampling approaches, metrics, sampling activities, and data analyses that are a part of the human dimensions monitoring to be conducted at Redfish Rocks and other sites that comprise Oregon's system of marine reserves.

B.1.a. Research questions

Human dimensions monitoring is designed to answer the following research questions:

1. Who are the consumptive users of the site, comparison areas, and general area? What are these uses? What is the level of consumptive use? How does this use change over time?
2. What are the general social, cultural, and economic drivers and characteristics of the communities of place? How are these variables tied to the site? How do these change over time?
3. What are the general attitudes and perceptions held by members of the various communities (place and interest) of implementation of the site? What are the motivating variables behind these attitudes and perceptions? How do these attitudes and perceptions change over time?
4. What are the potential social, cultural and economic effects to users and identified communities of displaced consumptive activities? How do these effects change over time?
5. Who, in general, are the non-consumptive users of the site, comparison areas, and general areas? What are these uses? What is the level of non-consumptive use? How does this use changes over time?
6. What are the non-market variables connected to the site? What are the social, cultural and economic values associated with these variables and how do these values change over time?

B.1.b. Monitoring approach

The above research questions serve as the foundation of the monitoring framework and guide monitoring strategies and activities for each reserve site. Monitoring has been designed to provide for area specific data and information, but also address a broader scope of research to add to Oregon's nearshore management efforts. Data collected during the first two years, before the prohibition of extractive activities take effect, will be used to generate a baseline for each marine reserve site. Monitoring is focused on four main areas.

General Social & Economic Characterization of the Area. Development of a socio-cultural and economic characterization of the shore-side communities that could most directly be affected by the site. This includes information such as historical records, demographics including employment data, social structure, tribal or spiritual connections, cultural and social events, and economic drivers of the local markets. This characterization attempts to set the "back story" and monitoring parameters for these communities.

Direct Use of the Area. Understanding who is using the site. First, quantitatively and spatially analyze available commercial and recreational fisheries data. Sources of data include logbooks, port sampling, on-board observer programs, and interview or survey instruments. The analysis allows identification of physical areas of use, which fisheries are targeted in these areas, and communities of place that may be affected from a displacement or disruption of these activities. Second, gather both existing and new data on non-consumptive use of the ocean and shore area connected to the site. Socio-cultural and economic information is also collected from the direct users of the area through various methods.

Attitude & Perception of Implementation. To manage these protected areas it is imperative to understand the attitudes and perceptions of stakeholders toward the process of implementation, monitoring and research, and management and enforcement. Understanding these aspects will allow managers and communities to address any issues related to education and outreach that may assist the public in understanding the goals of the marine reserve and protected area, what is to be learned, how this information will be applied to policy and management of these areas, and how stakeholders are involved in the process. Collecting this information will allow adaptation of strategies to better serve Oregonians and enlist stakeholder engagement in the success of these areas.

Assessment of the Non-market Aspects of the Area. To completely understand the potential economic and social effects, both positive and negative, of these protected areas it is essential to identify the non-market variables connected to the sites. The first step to address this important research question is to develop a comprehensive list of leisure and recreational users of the areas. This list will allow for development of research strategies to measure the importance of these users to the local communities and the importance of these areas to these users.

In addition to non-consumptive user identification, research will also be conducted to identify and measure the different "values" associated with the natural resources and qualities of the areas, such as the ecosystem services and studies to measure the various "benefits" of the areas.

B.2 Reporting and Review

Detailed methods, analyses, and results from monitoring of the Redfish Rocks site and additional marine reserve sites are to be presented in biennial monitoring reports. The monitoring reports will be provided to the RRCT and posted on the state's marine reserves website for access by the public. Adaptations to monitoring are anticipated over time as more is learned from monitoring activities. An extensive review of monitoring activities and updates to the monitoring plan should be conducted every five years, with assistance from external scientists and community members.

B.3 Community Engagement Strategies

Strategies, to be implemented by ODFW, for engaging the local community in human dimensions monitoring efforts have been developed in collaboration with the RRCT. These strategies are outlined below. Additional strategies may be identified in the future and specific activities implemented with continued collaboration between ODFW and the RRCT. For information about the community of Port Orford's priorities and implementation efforts related to socioeconomics of the Redfish Rocks site, please see Chapter IX.

Monitoring Reporting & Feedback. Twice per year, in the spring and in the fall, ODFW will report on human dimensions monitoring activities at regularly scheduled RRCT meetings. All RRCT meetings are open to the public and outreach will be conducted to encourage public participation. The meetings will provide an opportunity for ODFW to share updates with the local community on monitoring activities, analyses, and results and provide a forum for discussion of upcoming planned monitoring activities and opportunities for community engagement. In conjunction with the spring reporting, in partnership with the RRCT, ODFW will host a workshop where community team members and the public can receive more detailed information on monitoring activities and provide feedback and input to ODFW staff.

Non-ODFW Research. External scientists conducting human dimensions related research in the Port Orford area are encouraged to connect with and solicit feedback from the RRCT. They are also encouraged to share the results of their work with ODFW, the RRCT, and the Port Orford community. External scientists can contact ODFW program staff or RRCT staff for more information.

Outreach and Engagement

ODFW staff, with assistance and collaboration from external experts and community members, will be developing a plan for long-term outreach, and public and community engagement to be used for Oregon's limited system of marine reserve sites. Once completed, this plan will be added as an appendix to this management plan.

A. Goals and Objectives

The goals and objectives for outreach and engagement are developed to meet the following OPAC planning and implementation principles and guidelines (OPAC 2008):

- The public, including ocean users, coastal communities and other stakeholders, will be involved in the proposal, selection, regulation, monitoring, compliance and enforcement of marine reserves.
- Outreach and public engagement will be an ongoing part of the marine reserves planning and implementation process. Available scientific and other information will be made available to the public through outreach and websites.
- Marine reserves will be adequately monitored and evaluated in support of adaptive management. Cooperative and collaborative research will be encouraged as well as utilization of fishing vessels as research platforms. These activities will be compatible with the goal of conserving marine habitats and biodiversity.
- Education and economic development opportunities that are compatible with the goal of conserving marine habitats and biodiversity will be encouraged.

A.1 Goals

- The public understands the marine reserves goal and process and is able to engage in implementation in a meaningful way
- The public has access to research and monitoring information used in and collected from marine reserves implementation
- Marine reserves are an opportunity for the public to engage in cooperative and collaborative research, monitoring, and compliance activities
- The public has the necessary information and tools to comply with marine reserves regulations
- Marine reserves implementation helps build capacity within local communities' for stewardship of ocean resources
- Marine reserve implementation is transparent to the public

A.2 Objectives

- To provide relevant information to the general public regarding marine reserves policy and implementation, thereby increasing the public's awareness and knowledge about marine reserve implementation
- To increase the public's and decision makers' knowledge of the ecological and human dimensions research being conducted, thereby increasing their understanding of marine reserves and ocean resources in general
- To create meaningful opportunities for the general public to provide information and feedback to ODFW marine reserves staff
- To provide a meaningful way for communities associated with marine reserve sites to engage in research, monitoring, and compliance activities
- To encourage communities associated with marine reserve sites to develop site specific goals that are compatible with the goals and objectives of marine reserves

B. Outreach Strategies

The following outreach strategies, to be implemented by ODFW for the Redfish Rocks site, have been developed in collaboration with the Redfish Rocks Community Team (RRCT).

B.1 Signs

Marine reserve interpretive and regulatory signs will be designed by ODFW and the Oregon Parks and Recreation Department, with assistance from members of the RRCT and Oregon State Police. The signs will be posted at strategic locations. Interpretive signs will provide the general public basic information about the goal of Oregon's marine reserves, ecological and human dimensions monitoring occurring at the Redfish Rocks site, and the communities of interest and place associated with the site. The regulatory signs provide ocean users and the public with a map, boundary coordinates, and a summary of the prohibitions and allowances of the Redfish Rocks site.

B.2 Brochures

Marine reserve informational brochures are to be designed by ODFW and the Oregon Parks and Recreation Department, with assistance from members of the RRCT. Brochures are to be distributed and provided at strategic locations. The brochures will provide the general public basic information about the goal of Oregon's marine reserves, ecological and human dimensions monitoring occurring at the Redfish Rocks site, and the communities of interest and place associated with the site.

B.3 Website

ODFW and the Department of Land Conservation and Development will revamp the state's marine reserves website to focus on marine reserves implementation. Site specific information on the Redfish Rocks site will be provided on the website. The state's marine reserves website is located at: www.oregonocean.info/marinereserves.

The RRCT also has a website that provides information about the community team's efforts including community-lead outreach and education activities. For more information, refer to Chapter IX or visit the community team's website at www.redfishrocks.org.

Compliance and Enforcement

Enforcement of marine reserve sites is carried out by the Fish and Wildlife Division of the Oregon Department of State Police (Oregon State Police). Surveillance of sites is conducted by land and on the water by boat. Penalties for the take or attempt to take of fish, invertebrate, or wildlife species within a marine reserve site are dictated by the wildlife code (Chapter 496) and commercial fishing code (Chapter 506) within Oregon Revised Statutes.

Compliance and enforcement strategies, to be implemented by ODFW, have been developed in consultation with Oregon State Police and members of the RRCT. Strategies include outreach, procedures for removing lost fishing gear, procedures for scientific research, and monitoring and review of enforcement. The local Port Orford community has a large influence and will play a significant role in compliance with the Redfish Rocks rules. For information about the community of Port Orford's priorities and community-based implementation efforts pertaining to compliance and enforcement, please see Chapter IX. The following sections outline the state's strategies for compliance and enforcement.

A. Outreach

There are several strategies ODFW will use to reach and provide information to commercial fishermen, sport fishermen, and the general public on the prohibitions and allowances at the Redfish Rocks site.

A.1 Signs

Two types of signs, regulations signs and interpretive signs, will be posted at strategic locations. Signs are to be designed and sign locations determined in consultation with Oregon State Police and members of the RRCT.

A.2 Leaflets

Leaflets that include a map of the Redfish Rocks site, boundary coordinates, and a summary of the regulations will be developed in consultation with Oregon State Police. Leaflets may be distributed as handouts or in mailers.

A.3 Website

Site coordinates, regulations, and a map of the Redfish Rocks site will be available on the state's marine reserves website (www.oregonocean.info/marinereserves) and on the ODFW Marine Resources Program website (www.dfw.state.or.us/MRP/).

A.4 Synopsis of Commercial Fishing Regulations

Site coordinates and a synopsis of the prohibitions and allowances at the Redfish Rocks site will be posted in the annual Synopsis of Oregon Commercial Fishing Regulations produced by ODFW.

A.5 Sport Fishing Regulations Pamphlet

Information on the Redfish Rocks site will be posted in the annual Oregon Sport Fishing Regulations pamphlet, within the Marine Zone section under Special Regulations.

B. Procedures for Retrieval of Lost Fishing Gear

Marine reserve regulations include a provision for the retrieval of fishing gear that has accidentally drifted into the Redfish Rocks site.

B.1 Notify Oregon State Police

The retrieving vessel operator must notify Oregon State Police at 1-800-452-7888 and receive permission before retrieving the gear. No species may be retained from the retrieved gear.

B.2 Additional Provisions for Commercial Crab Pots

- If the pot(s) do not belong to the retrieving vessel, the vessel operator must follow the retrieval requirements set forth in OAR 635-005-0055(9)(b).
- If the pot(s) do belong to the retrieving vessel, the vessel operator may re-set the pot(s) outside of the reserve area.

C. Procedures for Scientific Research

C.1 Scientific Research That May Include Take

A Scientific Taking Permit is required to “take” fish and marine invertebrates for scientific or educational purposes from any waters belonging to the state of Oregon (OAR 635-007-0990). “Take” is defined in Oregon Administrative Rule (OAR 635-012-003(5)) as “to kill or obtain possession or control.” Take includes the use of all fishing gear and methods that affect an animal’s behavior or movement.

Marine reserve regulations include a provision for scientific take in the Redfish Rocks site (OAR 635 Division 012). The take must be deemed necessary and contribute to the evaluation of site condition, effectiveness, or impact of stressors (OPAC 2008). The following procedure is for non-ODFW researchers looking to conduct research that may include scientific take in the Redfish Rocks site or any other marine reserve site.

C.1.a. Scientific Taking Permit Required

Researchers must apply for and obtain an Oregon Scientific Taking Permit in order to conduct scientific research that may include take in any marine reserve site.

In addition to the standard information required in the permit application, the following information must be provided:

- Detailed project description, including identification of marine reserve site(s) where work is to be conducted, and how project will contribute to the monitoring or scientific study of the site(s).

- Rationale for why the take of species is necessary for monitoring or scientific study in order to evaluate reserve condition, effectiveness, or impact of stressors. And why alternative, no-take, methods are not practicable.
- Rationale for species and amount of take requested.
- Under the application section, “measures to minimize negative effects” describe measures that will be taken to minimize impacts to species and habitats located within the site(s).

All Scientific Taking Permit applications are reviewed by the appropriate ODFW District Fish Biologist and/or Marine Resources Program biologist depending on the research location. Applications for marine reserve sites will undergo an additional review by ODFW marine reserves staff. Permits may take up to eight weeks for processing. For more information or to apply for a permit visit the ODFW website at: http://www.dfw.state.or.us/fish/license_permits_apps/scientific_taking_permit.asp#oar.

C.1.b. Notification of Research Activity

The Principle Investigator (PI) named on the Scientific Taking Permit, must notify ODFW marine reserves staff at 1-541-867-7701, x228 and Oregon State Police at 1-800-452-7888, 24 hours prior to conducting research within the Redfish Rocks site or any other marine reserve. The PI is required to provide the date of activity, vessel name, vessel ID number, gear to be deployed, and the species to be collected.

C.2 Research Requiring Authorization from Department of State Lands

An authorization or removal-fill permit from the Oregon Department of State Lands (DSL) is required in order to conduct activities that may include structures in, on, under or over the seafloor or the removal, fill, and/or alteration of material (rock, gravel, sand, silt and other inorganic substances). DSL marine reserve regulations include provisions for research in marine reserve sites that require authorization or removal-fill permits (OAR 141 Division 142). DSL will only grant an authorization or a removal-fill permit if activities are deemed necessary to study, monitor, evaluate, enforce or protect a marine reserve site. In addition, DSL may grant an authorization for harvest or removal of subtidal kelp and other seaweeds (algae) in order to study, monitor, evaluate, enforce or otherwise further the purpose of the marine reserve site.

Authorizations for scientific experiments are issued under special use authorization rules by DSL (OAR 141 Division 125). The different types of authorizations may include:

- **Short term access agreements:** Issued for a term of less than one year. No application fee, no compensation (rent). The authorization has some indemnification language. Appropriate for short term research including the placement of instrumentation for a limited duration.
- **Special use licenses (less than 3 years) and special use leases (up to 30 years):** Both authorizations have an application fee, compensation and insurance requirements. Appropriate for the establishment of research projects that include long term placement of scientific equipment.

C.2.a. Applications for Authorizations and Removal-Fill Permits

Researches must apply for and obtain any necessary authorization or removal-fill permit from DSL prior to conducting the research activity within the marine reserve site. The proposed activities must meet the requirements of OAR 141-142-0020(1) and the marine reserve site management plan(s).

In addition to the standard information required in the application to DSL, the following information must be provided:

- Detailed project description, including identification of marine reserve site(s) where work is to be conducted, and how project will contribute to the monitoring or scientific study of the site(s).
- Rationale for why the activity is necessary for monitoring or scientific study to evaluate reserve condition, effectiveness, or impact of stressors. And why alternative methods are not practicable.
- Description of measures that will be taken to minimize impacts to species and habitats located within the site(s).

C.2.b. Applications for Subtidal Kelp and Seaweed Collection

Researches must apply for and obtain authorization by DSL to harvest or remove subtidal kelp or other seaweeds (algae).

In addition to the standard information required in the application to DSL, the following information must be provided:

- Detailed project description, including identification of marine reserve site(s) where work is to be conducted, and how project will contribute to the monitoring or scientific study of the site(s).
- Rationale for why the harvest/removal of specimens is necessary for monitoring or scientific study to evaluate reserve condition, effectiveness, or impact of stressors. And why alternative methods are not practicable.
- Rationale for which types of kelp or other algae are to be harvested/removed and amount of take requested.
- Description of measures that will be taken to minimize impacts to species and habitats located within the site(s).

C.2.c. Notification of Research Activity

The Principle Investigator (PI) named on the Authorization or Removal-Fill Permit, must notify ODFW marine reserves staff at 1-541-867-7701, x228 and Oregon State Police at 1-800-452-7888, 24 hours prior to conducting research within the Redfish Rocks site or any other marine reserve. The PI is required to provide the date of activity, vessel name, vessel ID number, and activity to be performed.

D. Monitoring and Review

Oregon State Police will conduct monitoring of enforcement efforts at the Redfish Rocks site and use the monitoring information to evaluate compliance and enforcement of the site. ODFW and Oregon State Police staff will meet two times per year to review compliance and enforcement efforts and determine if adjustments are needed. Workshops with the fishing fleet, sport fishermen, or the general public may be used to disseminate information or to discuss and gain feedback on specific compliance or enforcement issues.

Management Strategies for Disturbance Issues

This Chapter provides non-regulatory management strategies used to avoid or minimize wildlife and habitat disturbance issues, consistent with the marine reserves goal, objectives, and planning and implementation principles and guidelines. Issues and strategies are identified and developed by ODFW in collaboration with the RRCT and may involve other state or federal agencies as appropriate.

Through ongoing monitoring efforts, we may learn more about potential disturbances to wildlife and habitat. A review of issues and strategies will be conducted every five years as part of the implementation review (described in Chapter III). The review may trigger adaptations to strategies and updates to this segment of the site management plan.

A. Oregon Islands National Wildlife Refuge: Wildlife Disturbance

The offshore islands, and emergent rocks and reefs located within the Redfish Rocks site are part of the Oregon Islands National Wildlife Refuge and Oregon Islands Wilderness, managed by the U.S. Fish and Wildlife Service (USFWS). Seabirds and pinnipeds spend the majority of their life at sea foraging on marine fishes and invertebrates and return to land for breeding, loafing, and roosting. The islands and emergent rocks and reefs that comprise the Oregon Islands National Wildlife Refuge provide habitat that is important for vulnerable eggs, young, and adults. The refuge is closed to public access at all times to minimize human disturbance to wildlife.

Motorized and non-motorized watercraft approaching too close to the refuge have a high potential for disturbing seabirds and pinnipeds and can result in the reduction or loss of eggs and chicks, and in some cases in colony or rookery abandonment. Low flying aircraft have a high potential for disturbing seabird nesting grounds and pinniped breeding and resting sites (USFWS 2009). USFWS has developed guidelines and best practices for boaters, aviators, and wildlife viewers to avoid or minimize human caused disturbances to wildlife using the refuge islands, rocks, and reefs. USFWS advises all motorized and non-motorized watercraft to remain at least 500 feet away from all islands and emergent rocks and reefs associated with the Oregon Islands National Wildlife Refuge. Watercraft venturing closer than 500 feet may disturb wildlife and place the boat operator in violation of the Migratory Bird Treaty Act. USFWS requests aircraft pilots maintain an altitude of 2,000 feet above ground level or maintain one-half mile lateral distance from all coastal rocks and islands. Overflights lower than 2,000 feet AGL or closer than one-quarter to one-half mile have a high potential for disturbing seabird nesting grounds and pinniped breeding and resting sites.

Figure 4. USFWS sign, posted at the Port of Port Orford, describing boating and recreational guidelines to avoid or minimize human disturbance to wildlife.

A.1 Strategies

ODFW will assist USFWS by promoting and educating boaters, aviators, researchers, wildlife viewers, and the general public about USFWS guidelines and best practices for avoiding or minimizing human disturbance to wildlife.

A.1.a. Boaters, Aviators, Wildlife Viewers, and the General Public

Incorporate guidelines and best practices into outreach materials for the Redfish Rocks site. Provide the public with easy access to USFWS outreach materials and information including brochures at strategic locations in and around Port Orford and links to USFWS materials in this management plan and on the Oregon Marine Reserves website (www.oregonocean.info/marinereserves).

A.1.b. Scientific Researchers

Provide information to researchers about USFWS best practices and contact information for Oregon Islands National Wildlife Refuge staff for questions or consultation.

B.1 Additional USFWS Information Resources

- Oregon Islands National Wildlife Refuge website: www.fws.gov/oregoncoast/oregonislands/
- Map of Oregon Islands National Wildlife Refuge: www.fws.gov/oregoncoast/images/maps/ORG_public_111607.pdf
- Pacific Northwest Seabirds brochure: www.fws.gov/oregoncoast/PDF/seabird%20brochure-final_sm.pdf
- Catalog of Oregon Seabird Colonies: www.fws.gov/oregoncoast/seabird_colony_catalog.htm
- Oregon Islands, Three Arch Rocks, and Cape Meares National Wildlife Refuges: Comprehensive Conservation Plan and Wilderness Stewardship Plan: www.fws.gov/oregoncoast/CCP_ORG_CPM_TAR.htm

Contact information:

Oregon Coast NWR Complex
2127 SE Marine Science Drive
Newport, OR 97365
541-867-4550 office
541-867-4551 fax

Redfish Rocks Community Team
Community Priorities and Implementation

In 2009 POORT, the original proposers of the Redfish Rocks site, made a decision to form a separate official marine reserve community team that could more broadly represent the local community. Applications were solicited from the general public and a selection committee met in November 2009 to review applications. Members were selected in order to represent a diversity of stakeholder interests within the Port Orford community. The first Redfish Rocks Community Team (RRCT) meeting was held on December 7, 2009. During their first year, the RRCT met once every month. Currently, the RRCT meets the first Monday of every other month at the Port Orford City Hall. All meetings are open to the public. Information on the community team and their activities is available on the RRCT website at www.redfishrocks.org.

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A. Purpose and Community Goals

The purpose of the RRCT is to: "collaborate and develop recommendations for Redfish Rocks, considering biological and socioeconomic information and to serve as liaisons to the community on matters regarding Redfish Rocks" (RRCT 2011). The RRCT has played a major role in the development of the Redfish Rocks Marine Reserve Site Management Plan. The team's work is instrumental in providing a local perspective to understanding the needs and opportunities for successful implementation of the Redfish Rocks site, identifying priorities of the Port Orford community, and implementing community-based projects.

The RRCT collaborates with ODFW in the development of the state's implementation strategies for the Redfish Rocks site. Members of the community team assist with or provide consultation on specific state implementation efforts, such as the development and location of interpretive signs. The RRCT will also play a role in the implementation review and marine reserves evaluation of the Redfish Rocks site, as described in Chapter III.

This chapter is focused on the community of Port Orford's goals and objectives, and priorities for community action, for the Redfish Rocks site. These are considered complementary to the state's goals and objectives for marine reserves, but are above and beyond ODFW's available resources or are not within the agency's purview. The hope, by documenting these in the state's site management plan, is to spark interest and attract partners and supporters to assist the Port Orford community in implementation of these community goals, objectives, and priorities for action.

The RRCT has identified the community's goals for the Redfish Rocks site and goals and priorities for community action in the areas of biological science, socioeconomics, outreach and education, and compliance and enforcement.

The Port Orford community's overarching goals for the Redfish Rocks site, adopted by the RRCT, are:

1. Protect the natural habitats, ecological services and biological communities of Redfish Rocks Marine Research Reserve and Marine Protected Area to enhance resilience of nearshore ecosystems to natural and human-caused effects;
2. Enhance public awareness, understanding, and appreciations of the marine environment, the land-sea connection and the natural, historical and cultural resources of Redfish Rocks;
3. Support, promote, and coordinate scientific research on, and long-term monitoring of, Redfish Rocks;
4. Minimize significant and adverse social and economic impacts on ocean users and the Port Orford community;
5. Provide opportunities for economic development around education, research, and non-disturbing activities.

B. Biological Science

The RRCT and working groups are uniquely positioned to help with monitoring, conducting research, implementation review, and evaluation of the Redfish Rocks site. The RRCT is part of the local Port Orford community and has a broad base representing diverse stakeholder interests. As such, the community team provides a forum for keeping the local community and stakeholders informed on research being conducted and information being learned from ecological monitoring activities. The team also provides an opportunity to collect ideas for possible research, from the community's perspective. RRCT activities can assist the state's implementation efforts by filling important research gaps and sharing findings of both state-based and volunteer-based projects. The RRCT can focus efforts on areas that the state may not have the capacity or resources to.

B.1 Community Goals and Priorities

Community goals and objectives for biological science were developed by the community team's Biological Working Group and approved by the RRCT on December 5, 2011. These are complementary to ODFW's ecological monitoring goals and the research and monitoring outlined in the *Oregon Marine Reserves Ecological Monitoring Plan* that will be conducted at the Redfish Rocks site. The desire is to incite interest and attract researchers that will conducted work in-line with community priorities, in and around the Redfish Rocks site, to further assist the marine reserves evaluation and add to the knowledge of local nearshore resources in the Port Orford area.

B.1.a. Community goals

1. Facilitate a strong community connection with the Redfish Rocks marine reserve and MPA through citizen based science, science education and communication through collaborative partnerships with NGO's academia, and state agencies.
2. Lead fund-raising efforts to provide long-term stability for the Community Team.
3. Be the leader in marine reserve management in Oregon by involving the local community in coordination with ODFW.
4. Make science-based learning and outreach a primary tenet of the Redfish Rocks MR/MPA through diverse communication tools within and beyond the local community.

B.1.b. Community objectives

1. Develop a citizen science program by identifying projects in support of biological monitoring goals and objectives and matching appropriate projects with interested citizen volunteers.
2. Identify and develop focused research projects in and around the marine reserve with a particular focus on those projects ODFW may not have the resources to undertake. The biological working group will implement this objective by:
    a. Soliciting community to develop potential projects.
    b. Inviting potential researchers to Port Orford and encouraging them to conduct research in support of the evaluation of the Redfish Rocks Marine Reserve/Marine Protected Area.
    c. Assisting in grant writing in support of focused research projects.
    d. Assisting researchers in communicating research results in collaboration with the Redfish Rocks Community Team outreach and education working group.
3. Establish an annual local knowledge workshop with the purpose of reporting monitoring, research, and evaluation results, and soliciting ideas for research and evaluation.
    a. Collaborate with ODFW and academic communities (graduate students) to provide presentations and poster materials for workshop.
    b. Collaborate with other CT working groups and stakeholders to generate ideas on improving compliance, new research, and obtaining experiential knowledge which can help with monitoring, research and evaluation.
    c. Work with stakeholders to facilitate project idea development, prioritization and synthesis.
    d. Some initial ideas include:
        i. Identify sustainable fisheries
        ii. Investigate climate change effects
        iii. Investigate adaptive management
        iv. Investigate area based management using new tools like MarineMap
4. In collaboration with the other Redfish Rocks working groups, ODFW, and other partners, develop a communication program to share evaluation results with the community of Port Orford, and with other coastal communities involved in the marine reserve evaluation process. The biological working group will implement this objective by:
    a. Presentations to other civic, community and educational groups.
    b. Synthesis of research, monitoring, and evaluation information for web updates, brochures, posters, and newspaper articles.
    c. Workshops.

B.1.c. Community action plan

Community-based projects related to biological science are identified by the RRCT through development of annual socioeconomic action plans. For priority projects the action plan outlines tasks and objectives, and identifies the leader, partners, resources needed, timeframe, and deliverables. The

action plan is to be reviewed and updated at least one time per year by the RRCT. The action plan is available on the RRCT website at www.redfishrocks.org.

C. Socioeconomics

C.1 Community Goals and Priorities

The Port Orford community's goals and objectives for socioeconomics were developed by the community team's Socioeconomic Working Group and approved by the RRCT on July 12, 2010. The Port Orford community's priorities for action are predominately focused on economic development opportunities in association with the Redfish Rocks site.

C.1.a. Community goals

Mitigate adverse social and economic impacts of marine reserves on ocean users and the community of Port Orford. Positive social and economic effects will be sought using the marine reserves and MPA to encourage and promote social economic benefits for the Port Orford community at large.

C.1.b. Community objectives

1. Collect baseline information on the current economic, social and cultural condition of the marine economy and marine reserves and its effect on the Port Orford Community at large.
2. Use baseline data and long term monitoring data to evaluate and measure economic and social impacts to Port Orford stemming from the implementation of the marine reserve and marine protected area.
3. Collaborate with scientific experts, community team members, agency staff, local community members, the Port, local businesses and local fishermen to assist with the development of a long term socioeconomic monitoring plan for this site.

C.1.c. Community priorities for action

1. Identify and establish new business, eco-tourism opportunities, income opportunities for local fishermen, and new non-consumptive economic opportunities for Port Orford and North Curry County, in relation to the marine reserve and MPA, focused on research, education, recreation, business, and tourism.
2. Support the establishment of a field research station in Port Orford for implementation and ongoing research and monitoring.
3. Support the establishment of a Marine Reserve Interpretive Center at the visitor center in Port Orford.
4. Support the upgrade of infrastructure at the Port of Port Orford to support existing and emerging businesses brought about by marine reserves and marine protected areas.

C.1.d. Community action plan

Community-based social and economic projects are identified by the RRCT through development of annual socioeconomic action plans. For priority projects the action plan outlines tasks and objectives, and identifies the leader, partners, resources needed, timeframe, and deliverables. The action plan is to

be reviewed and updated at least one time per year by the RRCT. The action plan is available on the RRCT website at www.redfishrocks.org.

D. Outreach and Education

D.1 Community Goals and Priorities

Community goals and objectives for outreach and education were developed by the community team's Outreach and Education Working Group and approved by the RRCT on April 5, 2010.

D.1.a. Community goals

1. Promote an understanding of and support for marine reserves and marine protected areas
2. Promote an understanding of the unique natural and historical resources of Redfish Rocks
3. Build understanding of and compliance for the regulations in Redfish Rocks
4. Promote ocean literacy
5. Build partnerships and collaborate with formal and informal educators, community groups, organizations and government agencies
6. Communicate scientific activities and results related to Redfish Rocks

D.1.b. Community objectives

1. Develop programs for formal and informal educators that promote an understanding of and support for marine reserves, marine protected areas and ocean literacy.
2. Host a series of speakers that will enhance the understanding and awareness of marine reserves and marine protected areas.
3. Conduct outreach on developments related to Redfish Rocks through various media outlets.
4. Develop and distribute interpretive and educational materials.
5. Host and participate in a variety of events that increase the understanding and awareness of marine reserves and marine protected areas.
6. Create volunteer opportunities that allow community members to become stewards of Redfish Rocks.
7. Seek relationships with community members, school districts, agencies, organizations and other parties.
8. Seek funding opportunities to generate funds for outreach and education programs.

D.1.c. Community action plan

Community-based outreach and education projects are identified by the RRCT through development of annual outreach and education action plans. For priority projects the action plan outlines tasks and objectives, and identifies the leader, partners, resources needed, timeframe, and deliverables. The outreach and education action plan is to be reviewed and updated at least one time per year by the RRCT. The action plan is available on the RRCT website at www.redfishrocks.org.

E. Compliance and Enforcement

E.1 Community Goals and Priorities

Community goals and objectives for compliance and enforcement were developed by the community team's Compliance and Enforcement Working Group and approved by the Redfish Rocks Community Team on April 5, 2010. One of the highest community priorities that has been identified to aid with compliance is the purchase, installation, and maintenance of two buoys to mark the northwest and southwest corners of the marine reserve portion of the Redfish Rocks site. The RRCT is currently seeking a means of funding the community's marker buoy project.

E.1.a. Community goals

1. Educate recreational, consumptive, and non-consumptive users of the ocean about the Redfish Rocks Marine Reserve (MR) and Marine Protected Area (MPA).
2. Education shall include the location and boundaries of the MR and MPA, and the regulations and rules within the MR and MPA.
3. Provide educational information and MR/MPA visual representation at Highway 101, the beach, and the sea.
4. Build local and community knowledge of compliance for the regulations in Redfish Rocks.

E.1.b. Community action plan

Community-based projects are identified by the RRCT through development of annual compliance and enforcement action plans. For priority projects the action plan outlines tasks and objectives, and identifies the leader, partners, resources needed, and timeframe. The compliance and enforcement action plan is to be reviewed and updated at least one time per year by the RRCT. The action plan is available on the RRCT website at www.redfishrocks.org.

Appendices

A. Oregon Marine Reserves: Ecological Monitoring Plan (available at: www.oregonocean.info/marinereserves)

B. Oregon Marine Reserves: Human Dimensions Monitoring and Research Plan (available at: www.oregonocean.info/marinereserves)

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