CASCADE HEAD MARINE RESERVE SITE MANAGEMENT PLAN

2017

OREGON
Fish & Wildlife

Marine
Resources

ACKNOWLEDGMENTS

Many thanks to all the individuals that donated their time and hard work, contributing to the development of the management strategies for the Cascade Head Marine Reserve site and this document.

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ACRONYMS & ABBREVIATIONS

Cascade Head Site	Cascade Head Marine Reserve and Marine Protected Areas
DSL	Oregon Department of State Lands
MPA	Marine Protected Area
ODFW	Oregon Department of Fish and Wildlife
OPAC	Ocean Policy Advisory Council
OPRD	Oregon Parks and Recreation Department
OSP	Oregon State Police
RFP	Request for Proposals
STAC	Scientific and Technical Advisory Committee
USFWS	U.S. Fish and Wildlife Service

ICON LEGEND

Icons to help you navigate through the management plan.

FREQUENTLY ASKED QUESTION
Answers to some of our most frequently asked questions

MANDATE
A requirement, or guiding principle, that is to be carried out in the planning or implementation of marine reserves. Mandates come from state statutes, agency administrative rules, or policy recommendations from OPAC.

PROCEDURE
A procedure to be followed in order to stay in compliance with marine reserve administrative rules

FIND OUT MORE
Where you can find more information

KEY STRATEGIES
Management strategies that ODFW and our state agency management partners are committed to carrying out for the marine reserve sites

SITE SPECIFIC STRATEGY
A management strategy that has been developed specially for the Cascade Head site

CHAPTER 1. INTRODUCTION
OREGON'S MARINE RESERVES & HOW TO USE THIS PLAN

A. OREGON'S MARINE RESERVES AND THE ODFW MARINE RESERVES PROGRAM

Marine reserves are areas in Oregon's coastal waters dedicated to conservation and scientific research. In 2012, Oregon completed designation of five marine reserve sites. The Cape Falcon, Cascade Head, Otter Rock, Cape Perpetua, and Redfish Rocks and are each named after local natural landmarks. These sites are managed as a system by the State of Oregon, with the Oregon Department of Fish and Wildlife (ODFW) as the lead management agency.

ODFW's Marine Reserves Program is responsible for overseeing the management and scientific monitoring of the reserve sites. The team includes six full-time staff located in Newport, Oregon. The program's responsibilities include scientific monitoring, developing and implementing site management plans, providing information to the public, engaging communities, and supporting compliance and enforcement. Four additional state agencies share management responsibilities with ODFW.

In the year 2023, the Oregon Legislature has called for an evaluation of the Oregon Marine Reserves Program. This evaluation will reflect upon all aspects of the program including the management, scientific monitoring, outreach, community engagement, compliance, and enforcement of the five reserve sites. It also marks a point where Oregon will consider if and how marine reserves will continue to be used as a management tool moving into the future.

Regulate shoreline activities, including removal of natural products and other activities requiring an ocean shore permit. Provide interpretative and educational opportunities to enhance recreational experiences.

Regulate submerged and submersible land uses that require state authorization or a removal-fill permit, including harvest of subtidal kelp and the siting of ocean renewable energy projects and submarine cables.

WHAT IS A MARINE RESERVE?
Marine reserves are areas in our coastal waters dedicated to conservation and scientific research. All removal of marine life is prohibited, as is ocean development.

AND A MARINE PROTECTED AREA?
Marine Protected Areas (MPAs) are adjacent to the reserves. Ocean development is still prohibited, but some fishing activities are allowed. Rules are specific to each protected area.

HOW WERE THE LOCATIONS CHOSEN?
Local communities worked with state officials to site Oregon's reserves in areas that would provide ecological benefits while also avoiding significant negative impacts to ocean users and coastal communities (following Governor's Executive Order 08-07). The sites are located within Oregon's state waters, all within 3 nautical miles from land

B. OUR PROGRAM'S PRINCIPLES

The ODFW Marine Reserves Program is entrusted with leading the management and scientific monitoring of Oregon's marine reserve system. Our staff have developed the following program principles that serve as a daily guide to our work, help our program evolve as we learn and adapt, and ensure that we focus and stay true to the tasks that Oregonians have entrusted to us.

The ODFW Marine Reserves Program's principles hold that we are committed to:

- **MEETING OREGON'S MARINE RESERVES MANDATES** Our work is devoted to implementing the marine reserves mandates provided by the Oregon Legislature and the Ocean Policy Advisory Council.

- **PRODUCING ROBUST SCIENTIFIC INFORMATION** We do rigorous scientific monitoring and research that provides information to support marine reserves and nearshore ocean management.

- **PROVIDING DIVERSE WAYS FOR PEOPLE TO ENGAGE** We foster and support a diversity of ways for people with different interests, spanning different age groups and generations, to engage in marine reserves implementation.

Provide enforcement of the regulations associated with each site. Provide information and education in support of voluntary compliance.

Administer the Oregon Territorial Sea Plan, which provides the legal and regulatory framework for management of the Territorial Sea. Provides staff support for the Ocean Policy Advisory Council (OPAC).

- **PROVIDING TRANSPARENCY AND SHARING AS WE GO** We document and clearly communicate our work and how it ties to our mandates. We are transparent in our Program's activities and operations.

C. HOW TO USE THIS DOCUMENT

The *Cascade Head Marine Reserve Site Management Plan* outlines the state's marine reserve mandates and describes the management strategies that have been developed for the site. The Cascade Head site includes a marine reserve and three Marine Protected Areas (MPAs). This plan has been developed by ODFW staff with assistance and collaboration from state and federal agencies, local community members, and other interested stakeholders. This site management plan can be used in the following ways:

- To understand the state's mandates guiding the implementation of Oregon's marine reserve sites and the ODFW Marine Reserves Program.
- To see the state's and the communities' priorities for the management of the Cascade Head site.
- To see the management strategies that ODFW and our state agency management partners are committed to carrying out for the Cascade Head site. These management strategies have been developed to support scientific monitoring, provide information to the public, engage communities, and to support compliance and enforcement.
- To understand the local communities' interests for activities above and beyond what is being carried out by ODFW or our state agency management partners. By highlighting the communities' interests we hope to attract additional research and resources, and to foster community led projects.

By documenting priorities and management strategies here in the management plan we hope to spur additional support and engagement, and attract complementary actions by others, to further assist with implementation of the Cascade Head site. As implementation of the site evolves over time, the *Cascade Head Marine Reserve Site Management Plan* will be reviewed and updated every five years with input and assistance from local communities and other interested stakeholders.

D. WHERE TO FIND MORE INFORMATION

Looking for additional information on Oregon's marine reserves or the ODFW Marine Reserves Program? Check out these resources.

	VISIT THE STATE'S OFFICIAL OREGON MARINE RESERVES WEBSITE AT OREGONMARINERESERVES.COM
	STAY UP TO DATE WITH OUR ELECTRONIC NEWSLETTER, SIGN-UP AT OREGONMARINERESERVES.COM/NEWSLETTER
	FIND FISHING RULES, MAPS, AND BOUNDARY COORDINATES AT OREGONMARINERESERVES.COM/RULES
	FIND PHOTOS AND UNDERWATER VIDEOS AT OREGONMARINERESERVES.COM/MEDIA
	VISIT OUR LIBRARY TO FIND RESEARCH REPORTS, OUTREACH MATERIALS, CONTRACT APPLICATIONS AND MORE AT OREGONMARINERESERVES.COM/LIBRARY

CHAPTER 2. MARINE RESERVE MANDATES
REQUIREMENTS & GUIDING PRINCIPLES

In this chapter we provide an overview of the state's mandates for Oregon's marine reserves. Mandates are the requirements, as well as guiding principles, for the planning and implementation of the reserves as necessitated by state statute, administrative rule, or policy guidance. In subsequent chapters we outline the priorities and specific management strategies that ODFW and our state agency management partners will be implementing for the Cascade Head site in order to best meet these mandates.

A. WHERE ARE THE MANDATES FROM?

A.1 STATUTES (ORS)

The Oregon Legislature has passed two marine reserves bills, one in 2009 and one in 2012. Oregon Revised Statutes (ORS) 196.540 through 196.555 provide instructions to state agencies and set siting, planning, and implementation requirements for the Cape Falcon, Cascade Head, Otter Rock, Cape Perpetua, and Redfish Rocks sites. They also call for a comprehensive evaluation of the Oregon Marine Reserves Program and a report to the Oregon Legislature in the year 2023.

A.2 ADMINISTRATIVE RULES (OARS)

Site boundaries, as well as the prohibited and allowed activities for the marine reserves and MPAs are set in state agency administrative rules (OARs) by three state agencies. In 2009 and 2012, OARs were adopted for the Cape Falcon, Cascade Head, Otter Rock, Cape Perpetua, and Redfish Rocks sites by the State Land Board, the Fish and Wildlife Commission, and the Parks and Recreation Commission: OAR 141-142 (DSL), OAR 635-012 (ODFW), and OAR 736-029 (OPRD).

WHERE TO FIND THE STATUTES AND RULES

OREGONMARINERESERVES.COM/LIBRARY/#POLICY

WHAT DO YOU MEAN BY MANDATE?

Mandates are the requirements, as well as guiding principles, to be carried out for the planning and implementation of Oregon's marine reserves.

WHERE DO THE MARINE RESERVE MADATES COME FROM?

- **STATUTES** - Passed by the Oregon Legislature
- **AGENCY ADMINISTRATIVE RULES** - Adopted by state agency Commissions and Boards
- **POLICY RECOMMENDATIONS** – Developed by the Ocean Policy Advisory Council

DEPARTMENT OF STATE LANDS (DSL)

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 and the siting of ocean renewable energy projects and submarine cables.

DEPARTMENT OF FISH AND WILDLIFE (ODFW)

Rules regulate fishing, hunting and take of fish, invertebrate, and wildlife species.

PARKS AND RECREATION DEPARTMENT (OPRD)

Rules regulate shoreline activities including extraction of living (i.e., seaweed) and non-living natural products, and disruptive activities.

A.3 POLICY RECOMMENDATIONS - OCEAN POLICY ADVISORY COUNCIL (OPAC)

The Oregon Ocean Policy Advisory Council (OPAC) -- a legislatively mandated body that advises the Governor, state agencies, and local governments on marine resource policy issues -- developed and approved the *Oregon Marine Reserve Policy Recommendations* document in 2008. These recommendations provide guidance to state agencies on the siting, development, and implementation of Oregon's marine reserve sites.

B. THE MANDATES THAT SHAPE OUR MANAGEMENT

Here we outline the key marine reserve mandates -- provided by OPAC and the Oregon Legislature -- that guide us in our development of management strategies for the Oregon marine reserve system and the Cascade Head site.

B.1 WHAT IS A 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)

B.2 ... AND A MARINE PROTECTED AREA?

Marine Protected Areas (MPAs), which allow or prohibit specific extractive activities, are also included Oregon's marine reserves system. 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 specific allowed and prohibited extractive activities of each MPA are defined in agency administrative rules.

B.3 WHY? MARINE RESERVE GOALS AND OBJECTIVES

The strategies outlined in this management plan for the Cascade Head site have been developed to meet the OPAC goals and objectives for Oregon's marine reserves.

OREGON'S MARINE RESERVE GOALS

CONSERVATION

Conserve marine habitats and biodiversity.

GOALS

Oregon's marine reserve goals are 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)

OBJECTIVES

Marine reserve objectives help 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.

RESEARCH

Serve as scientific reference sites, to learn about marine reserve protections and Oregon's nearshore ocean, to inform management.

COMMUNITIES

Avoid significant adverse impacts to ocean users and coastal communities.

B.4 PLANNING AND IMPLEMENTATION PRINCIPLES AND GUIDELINES

Additional guidance is provided in marine reserve planning and implementation principles and guidelines set by OPAC (2008).

PLANNING PRINCIPLES AND GUIDELINES:

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.

IMPLEMENTATION PRINCIPLES AND GUIDELINES:

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

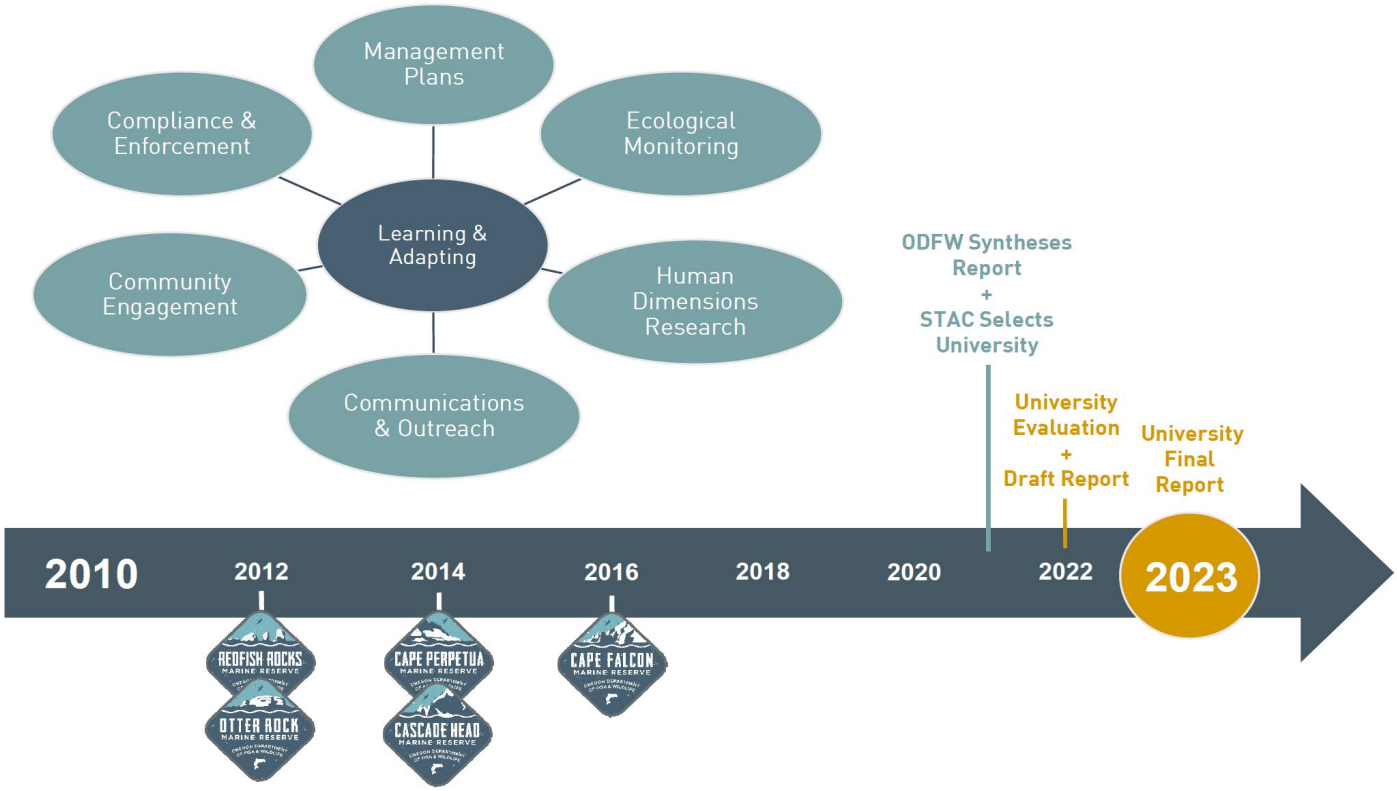
conserving marine habitats and biodiversity will be encouraged.

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.

C. PROGRAM EVALUATION AND REPORT IN 2023: A CHECK-IN

The Oregon Legislature calls for a check-in and report on the Oregon Marine Reserves Program due to the Legislature by March 1, 2023 (ORS 196.540 through 196.555). The check-in will include evaluating the various aspects of the Program including management, scientific monitoring and research, outreach, community engagement, compliance, and enforcement of the reserves. It also marks the first point at which the state may consider adaptive management of the marine reserve system, including the role of reserves as a nearshore resource management tool moving into the future.

The Scientific and Technical Advisory Committee (STAC) is to select an Oregon public university to research and prepare the report due to the Legislature. ODFW staff will be preparing a synthesis report on the Program in the year 2021, to aid the university's evaluation. The university evaluation will be conducted in 2022, with a draft report provided to the Oregon Legislative Assembly's interim committees on environment and natural resources by October 1, 2022 and a final report to the Legislative Assembly no later than March 1, 2023.



CHAPTER 3. HOW WE IMPLEMENT THE RESERVES

In this chapter we provide an overview of how Oregon's marine reserves are used, how we will review and adapt management strategies for the Cascade Head site over time, and the evaluation of the Oregon Marine Reserves Program in the year 2023.

A. HOW MARINE RESERVES ARE USED

A.1 CONSERVATION AND SCIENTIFIC RESEARCH

The goals and objectives, provided by OPAC (see Chapter 2, B.3), specify that Oregon's marine reserves are to be used in two ways:

1. **TO CONSERVE MARINE HABITATS AND BIODIVERSITY** In order to protect the marine habitats and biodiversity within a given site, all extractive activities are prohibited within a marine reserve.

2. **TO SERVE AS SCIENTIFIC REFERENCE AREAS** As reference areas, the marine reserves allow us to learn about the effects that protections -- no fishing and no ocean development -- have on marine species and habitats, to differentiate the effects of natural vs. human-induced stressors, and to learn about Oregon's nearshore ocean ecosystem.

   This is a long-term research and monitoring program. What we're learning from this work is being used to support the management of marine reserves and sustainable nearshore ocean resources and coastal communities here in Oregon.

A.2 FIVE CASE STUDIES

Each of Oregon's marine reserve sites is unique. They are different shapes and sizes. They have distinct habitats and biological characteristics. They experienced different types and levels of fishing pressure before closure. The coastal towns and communities most closely tied to each site have differing demographics.

These unique characteristics mean we will likely see different conservation outcomes, and different effects on people and communities, at each site. This gives us an opportunity to use Oregon's marine reserves as five case studies to learn from. By examining these case studies over time we will learn how these different marine reserve site designs and placement matter, and understand the strengths and weaknesses of different management strategies.

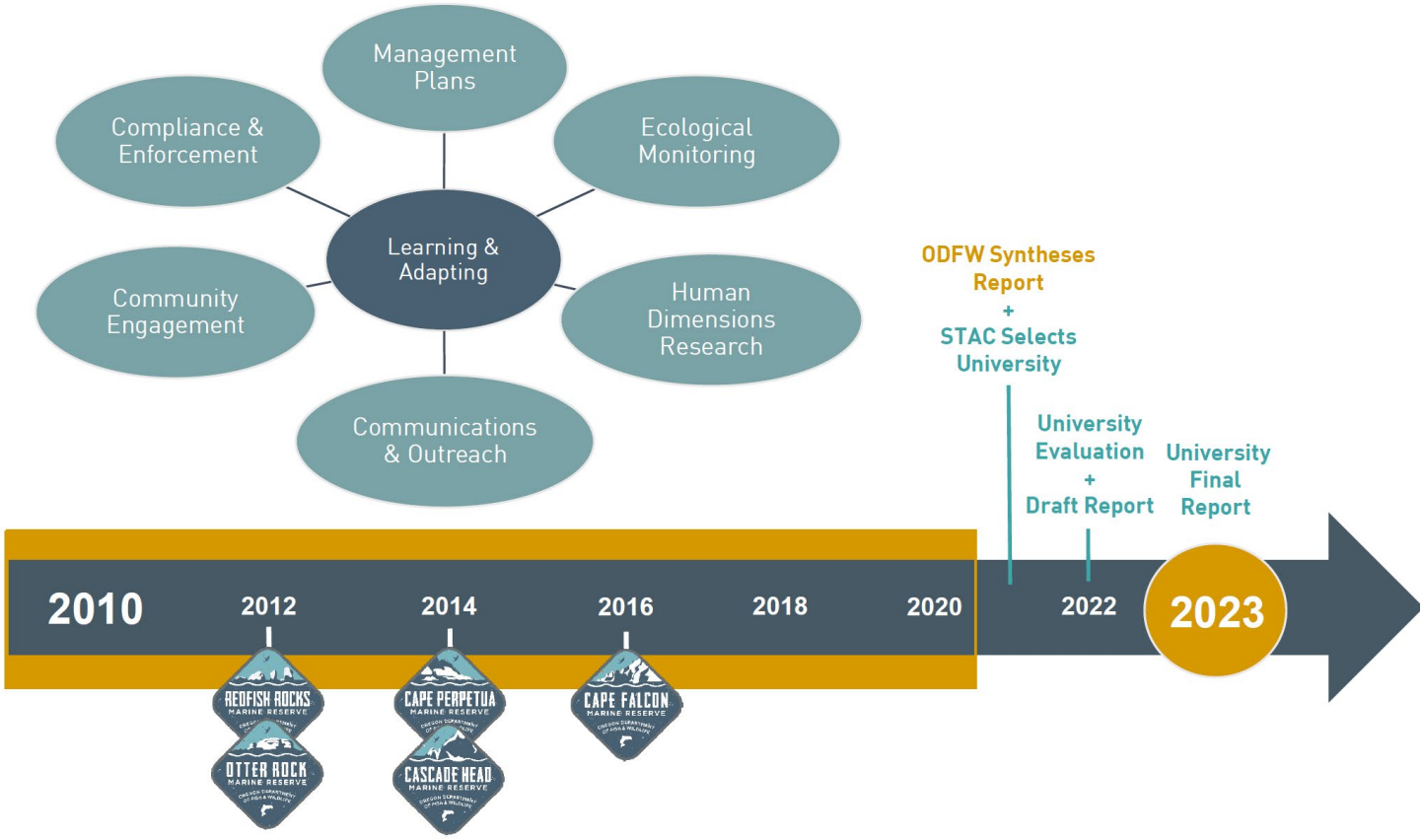
B. LEARNING AND ADAPTING

This plan outlines the state's priorities and management strategies that ODFW and our other state agency management partners are committed to carrying out for supporting scientific monitoring, providing information to the public, engaging communities, supporting compliance and enforcement, and for addressing site specific management issues for the Cascade Head site. We anticipate these management strategies will evolve and be adapted over time as we continue to learn from our implementation efforts.

A review of these management strategies will be conducted every five years with input from community members. The review will be guided by OPAC's principles and guidelines (Chapter 2, section B.4) and will focus on the progress made to date on implementing the management strategies and strategy effectiveness. The review may trigger adaptations to strategies, and updates to this site management plan, in order to better meet the OPAC planning and implementation principles and guidelines. Any adaptations to management strategies being considered will include consultation with local communities.

C. PROGRAM EVALUATION AND REPORT IN 2023: A CHECK-IN

The Oregon Legislature calls for a check-in and report on the Oregon Marine Reserves Program due to the Legislature by March 1, 2023 (ORS 196.540 through 196.555). The check-in will include evaluating the various aspects of the Program including management, scientific monitoring and research, outreach, community engagement, compliance, and enforcement of the reserves. It also marks the first point at which the state may consider adaptive management of the marine reserve system, including the role of reserves as a nearshore resource management tool moving into the future.



There is general agreement from the scientific community that this evaluation timeframe is too brief for substantive ecological changes to occur due to marine reserve protections. With Oregon's temperate marine ecosystem – where many species grow slowly, mature late, and are long-lived – scientists project a minimum of 10-15 years after extractive activities (e.g., fishing) have ceased before we might

begin to scientifically detect any ecological changes. However, this timeframe does provide for the establishment and evaluation of: (a) a rigorous long-term monitoring program, (b) the generation of robust datasets from which we can track and understand future ocean changes, (c) information that furthers our knowledge about design and placement of marine reserves in Oregon, and (d) contributions of data and information used to support other nearshore ocean management and policy efforts as well as support understanding of emerging ocean issues.

CHAPTER 4. CASCADE HEAD MARINE RESERVE
SITE CHARACTERISTICS & DESIGNATION HISTORY

The Cascade Head Marine Reserve is located off the central Oregon coast, stretching between the Cascade Head headland and Lincoln City (Figure 1). The site includes a marine reserve that covers 25.1 km^2 of ocean and three Marine Protected Areas (MPAs) that encompass an additional 59.7 km^2. The site also includes stretches of rocky shoreline that are protected both in the marine reserve and in the North MPA.

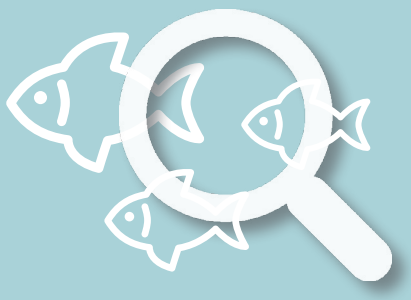
The marine reserve prohibits all extractive activities - including fishing and ocean development - with an exception provided for scientific monitoring or research if it is deemed necessary for evaluating the condition of the reserve, reserve effectiveness, or the impact of stressors (OPAC 2008; see Chapter 2, B.1).

The MPAs prohibit ocean development but allow for some fishing activities. Fishing prohibitions and allowances are specific to each MPA and are summarized here:

NORTH MPA	WEST MPA	SOUTH MPA
No take except: • Crab is allowed • Salmon, by troll, is allowed • Groundfish, when recreationally angling from a private non-chartered boat, is allowed	No take except: • Crab is allowed • Salmon, by troll, is allowed	No use of net fishing gear. All other legal gear and take is allowed.

In this chapter we provide an overview of the geology and marine environments in the local region, look at what makes the marine reserve at Cascade Head unique, and provide a brief history of how the Cascade Head site came to be designated.

SCIENTIFIC MONITORING AND HARVEST RESTRICTIONS



BEGAN 2012

BEGAN 2014

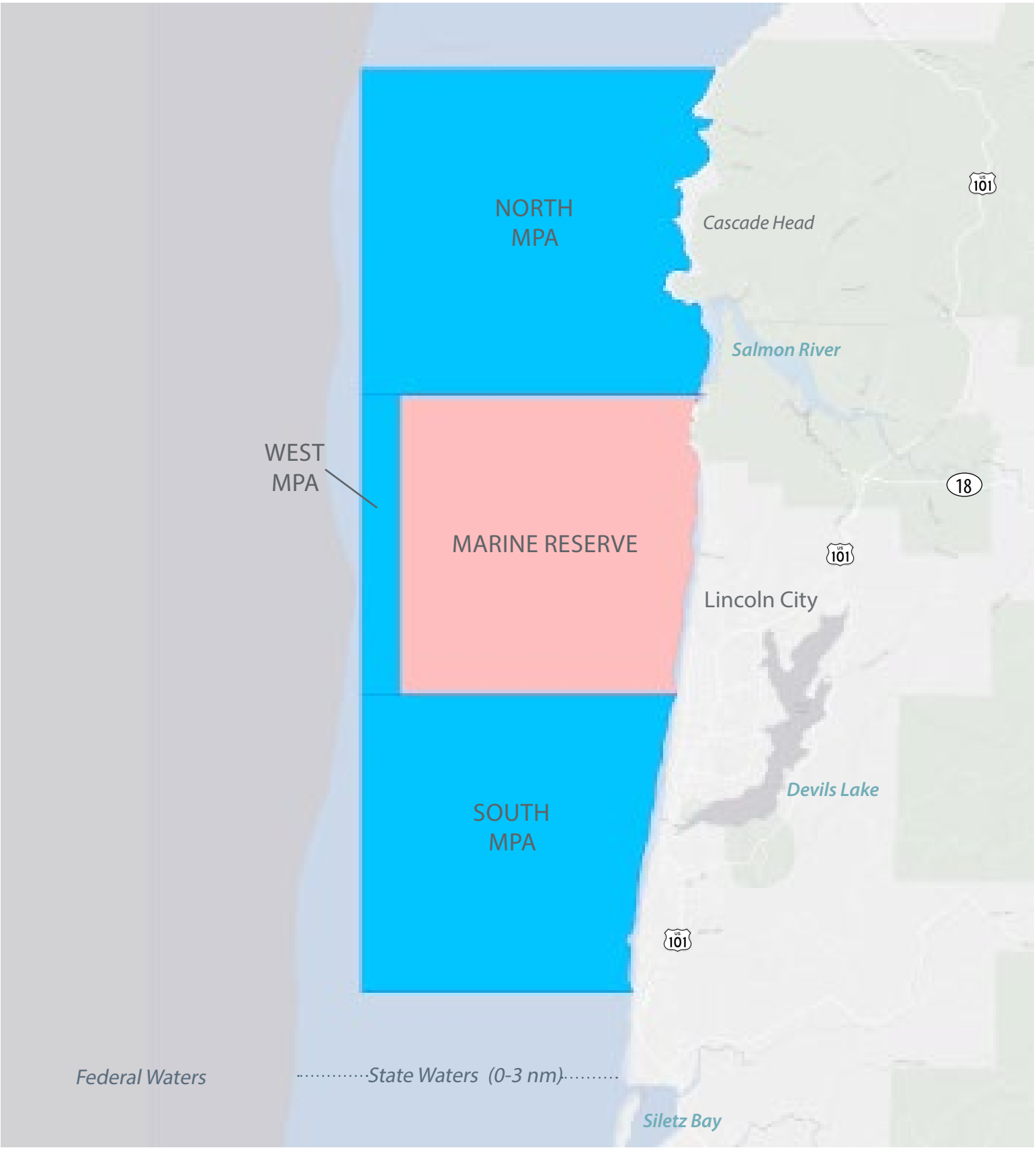


Figure 1. Map of the Cascade Head Marine Reserve site. The site includes a marine reserve that covers 25.1 km^2 (9.7 mi^2) of ocean, surrounded by three Marine Protected Areas (MPAs) that encompass an additional 59.7 km^2 (23.1 mi^2).

A. THE LOCAL GEOLOGY AND MARINE ENVIRONMENT

Here we provide an overview of the geology and nearshore marine environment in the region in and around the Cascade Head site, from the major headland at Cascade Head south to Government Point. Long-term ecological monitoring will provide us with more details about the marine environment in this area over time. More information on the ecological monitoring being conducted at the Cascade Head site can be found in Chapter 5.

A.1 CASCADE HEAD TO ROADS END HEADLAND

Located between the towns of Neskowin and Lincoln City, Cascade Head is the major headland for which the marine reserve site is named. Shoreline features of the headland include basalt cliffs, in some instances rising more than 500 feet above the sea, as well as many small coves and offshore rocks. On the south side of the headland is a narrow shelf that juts out and slopes down to a sandy beach. Boulders of various sizes are scattered and embedded in the sand. Mussel beds cover much of the narrow shelf (ODFW 1994).

Offshore, extending from the Cascade Head headland out to the extent of Oregon's state waters (3 nautical miles from land), sand is the dominate substrate along the seafloor and depths range up to 64 meters. Closer to shore, in depths shallower than 20 meters, running parallel to the headland we find small patches of rock and mixed substrate including 34 emergent rocks that rise from the seafloor and stick above the surface of the water.

Just south of the headland is the Salmon River, which is a source of freshwater input into the marine environment in this area. Moving south, beyond the mouth of the Salmon River, is a strip of sandy beach that ends at the Roads End headland. This is a small headland with multiple small coves. Sea stacks offshore are remnants of a once larger Cascade Head (Lund 1974a). The intertidal area on the south end of the Roads End headland consists of high relief bedrock. This area has many tidepools and channels amongst the rocks. Invertebrates found in the intertidal area here include large patches of aggregating anemones, as well as beds of mussels and barnacles. Invertebrate and algal species resistant to sand scour and burial are found in the areas that transition between rock and sand (ODFW 1994).

This area around Cascade Head is a major upwelling center, generating productive waters that influence areas farther south.

A.2 ROADS END HEADLAND TO SILETZ BAY

Between the Roads End headland and Siletz Bay is a long stretch of sandy beach that extends alongside Lincoln City. This sandy beach is interrupted periodically by scattered sea stacks, large rocks, sections of exposed bedrock platforms, or low-lying bedrock intertidal areas. The upland area lies on a marine terrace and sand dune formation, with cliffs varying in height from 10 to 150 feet above the sandy beach. About mid-way between the Roads End headland and Siletz Bay is D River, which flows a mere 120 feet, from Devils Lake into the ocean (ODFW 1994).

A.3 SILETZ BAY TO GOVERNMENT POINT

The Siletz Bay, on the south end of Lincoln City, is another significant source of freshwater input into the marine environment in this area. South of the mouth of Siletz Bay is another long stretch of sandy beach until you reach the south end of the unincorporated community of

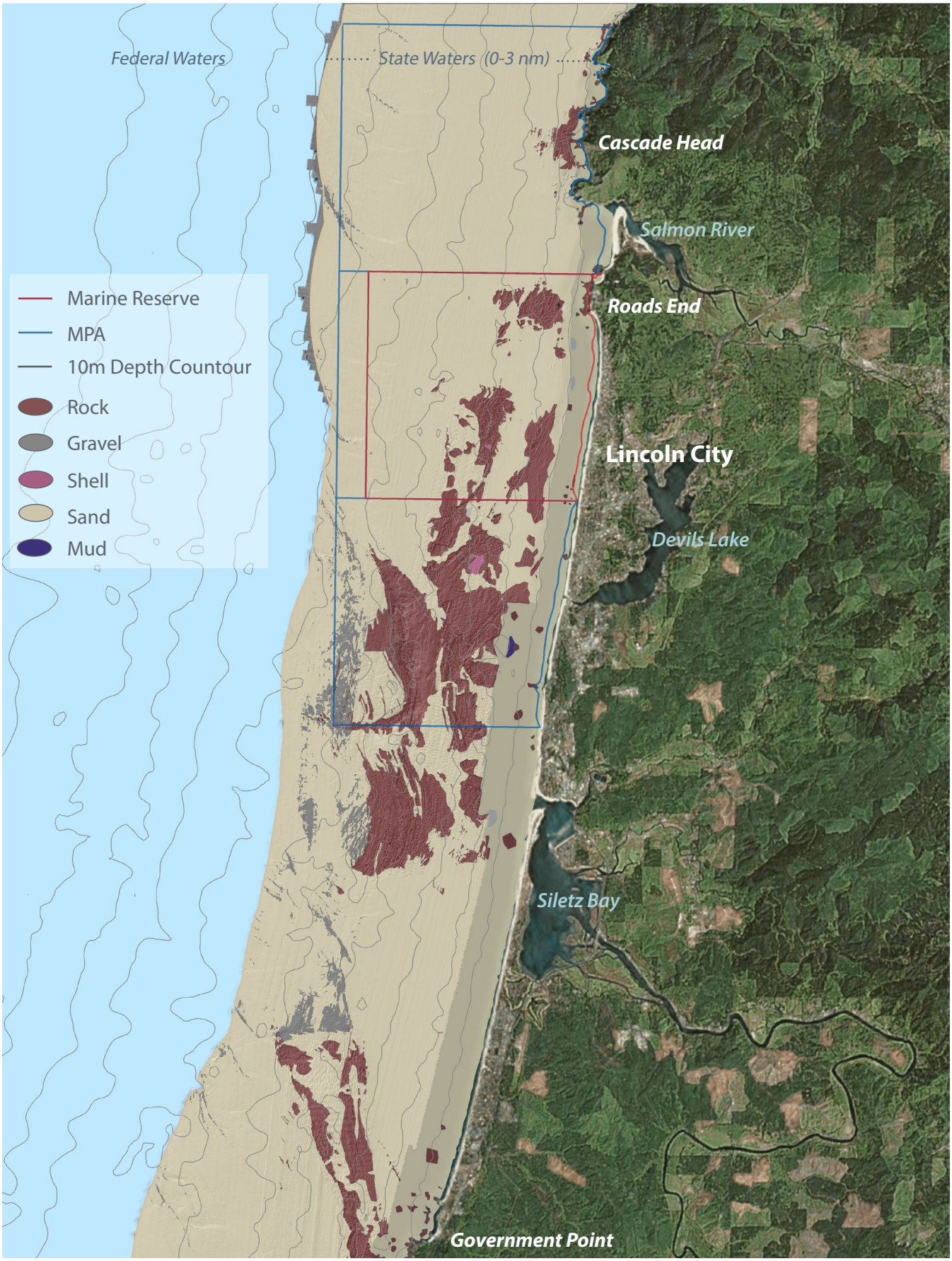


Figure 2. Seafloor habitat map of the nearshore marine waters in and around the Cascade Head Marine Reserve site.

Lincoln Beach. The rocky shoreline between Lincoln Beach and Government Point consists of low basalt cliffs and headlands. Just north of Government Point, at Fogarty Creek and Boiler Bay, the basalt walls have been eroded away to expose softer sandstone substrate where coves have formed. The shoreline around Fogarty Creek and Boiler Bay consist of a mix of boulder fields, bedrock platforms with surge channels, and some sandy beaches. Boiler Bay has a diverse community of intertidal plants and animals due to the variety of substrate types and wave exposure regimes.

A.4 SILETZ REEF

Offshore, from the Roads End headland down to Government Point, is the Siletz Reef complex. This is a nearshore rocky reef that spans approximately 71 km2, extending offshore two to three miles and to depths up to 50 meters. The reef has two primary regions of bedrock outcrops, separated primarily by sediment. The larger northern portion covers approximately 25 km2, while the smaller southern area covers approximately 7 km2. The northern reef outcrop is dominated by massive bedrock formations ranging in size from .0075 to 2 km2, with distinct areas of complex, high relief, and sloping column like structures. Smooth and gently-sloping low relief bedrock benches are present to a lesser degree. Bedrock ridges are intermixed with deep channels oriented in a southwest to northeast direction. Boulder and cobble fields are a minor component on the reef, found among the bedrock areas and in the form of debris fields around the perimeter. The southern reef outcrop has less relief and is characterized by a greater proportion of low relief bedrock. The area quickly transitions from rocky outcrops to sand at the reef margins (Merems and Romsos 2004).

B. WHAT MAKES THE CASCADE HEAD RESERVE UNIQUE

Each of Oregon's marine reserves is unique. They are different shapes and sizes. They have distinct habitats and biological characteristics. They experienced different types and levels of fishing before closure. And the coastal towns and communities most closely tied to each site differ. These unique features mean we will likely see different conservation outcomes, and different effects on people and communities, at each site. Here we focus on some of the characteristics that make the marine reserve at Cascade Head unique.

HARVEST RESTRICTIONS BEGAN	January 1, 2014
MONITORING BEGAN	2012
SIZE	Reserve: 25.1 km^2 (9.7 mi^2) MPAs: 59.7 km^2 (23.1 mi^2)
DEPTH RANGE	0-50 m (0-164 ft)
HABITATS	Emergent rocks, large boulders, and flat bedrock extending out into deeper waters. Soft bottom habitats in shallower areas. Rocky intertidal habitats.
HABITAT CONNECTIVITY	Rocky reef habitats extend beyond the reserve.
PRIOR FISHING PRESSURE	Relatively high due to active local fishery.

B.1 RELATIVE COMPARISONS BETWEEN RESERVES

When we make a relative comparison of the characteristics between Oregon's five marine reserves, the reserve at Cascade Head:

- Is considered large in size.
- Includes a broad range of depths.
- Has a diversity of habitats, including rocky intertidal habitats and large areas of subtidal rock habitat. Rocky reef habitats extends beyond the reserve.
- Experienced high fishing pressure prior to closure, particularly for groundfish species associated with rock habitat.

B.2 UNIQUE MARINE FEATURES

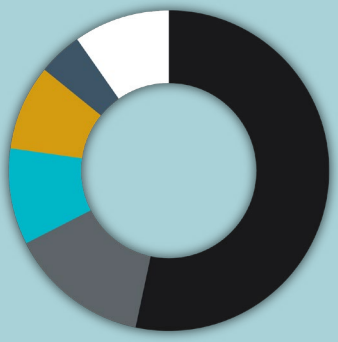
Some of the distinctive features found within the marine reserve at the Cascade Head site are described here.

HABITATS

Intertidal - The north end of the marine reserve includes rocky intertidal habitats. These habitats are located in the intertidal zone, a narrow band of shoreline that is covered by water during high tides and then exposed at low tides. Here you'll find invertebrates such as mussels, sea stars, and snails as well as a variety of seaweeds.

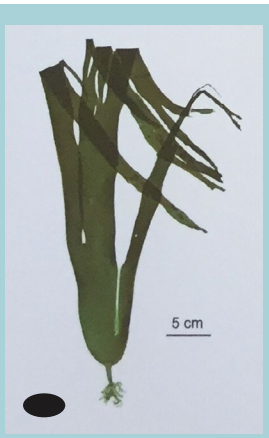
Subtidal - Underwater, the reserve includes a variety of habitats including the north segment of the Siletz Reef (Figure 2). This extensive rocky reef is home to many species of groundfish such as black rockfish, canary rockfish, lingcod, and kelp greenling. The reef also hosts many species of invertebrates, such as giant plumose anemones, and seaweeds. This rocky reef habitat extends beyond the reserve into the North MPA, as well as the South MPA and beyond.

COMMON ALGAE SPECIES



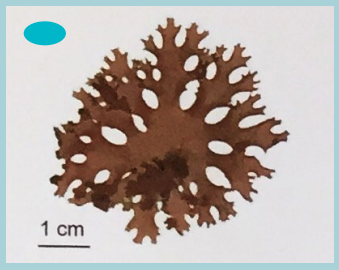
Proportion of species observed during ODFW's benthic extraction surveys conducted during baseline data collection in the marine reserve

Other

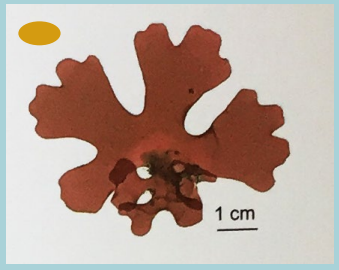


Laminaria longipes

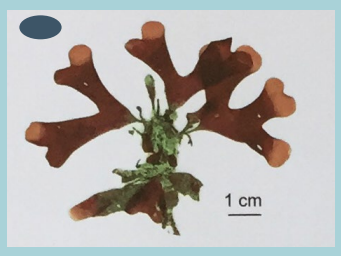
Pleurophycus gardneri



Callophyllis flabellulata



Rhodymenia californica & pacifica



Fryeella gardneri

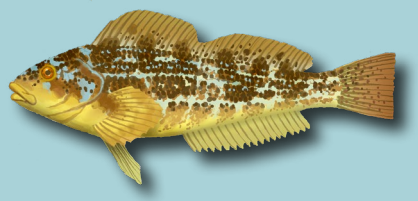
Photos by Dr. Gayle Hansen

OCEANOGRAPHIC FEATURES

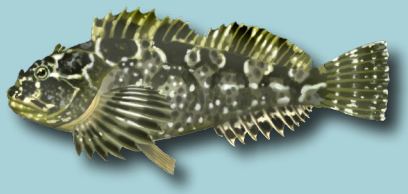
Just north of the reserve, the Salmon River flows out into the ocean providing a freshwater input into the marine environment. The area around Cascade Head is also a major upwelling center that creates productive waters that influence areas to the south.

COMMON FISH SPECIES

Black Rockfish



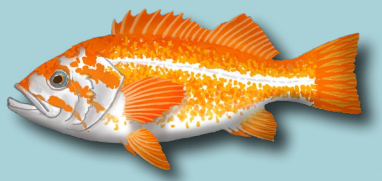
Kelp Greenling



Cabezon

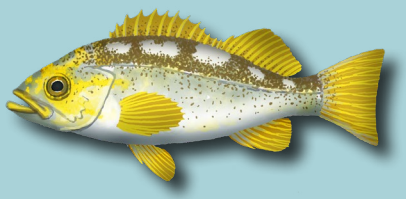
Other

Lingcod

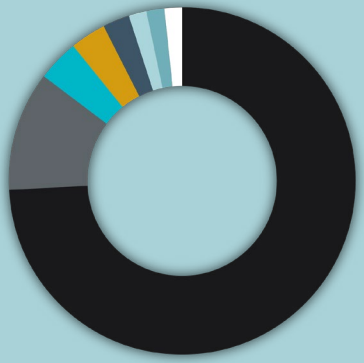


Canary Rockfish

Deacon Rockfish



Yellowtail Rockfish



Proportion of species caught during ODFW's hook and line surveys to date in the marine reserve

Art Work: Oregon Coast Aquarium

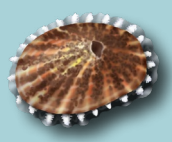
COMMON INVERTEBRATE SPECIES

Stalked Tunicate

Blood Star

Embedded Sea Cucumber

Leather Star



Rough Keyhole Limpet

Other

Proportion of species observed during ODFW's SCUBA surveys to date in the marine reserve

B.3 THE HUMAN CONNECTION

Towns and ports is close proximity to the Cascade Head site include Pacific City, Otis, Lincoln City, Depoe Bay, and Newport. The ocean, estuaries, and terrestrial lands in this area are also of cultural significance to the Confederated Tribes of Siletz Indians and the Confederated Tribes of Grande Ronde.

The nearshore waters in and around the Cascade Head site support many forms of consumptive and non-consumptive activities. Recreational and commercial fishing are established uses in this area. Commercial fishing vessels hailing from Pacific City, Depoe Bay, Newport, and other ports along the west coast fish these nearshore waters targeting mainly groundfish, crab, and salmon. Recreational private and charter boats use this area to target mainly groundfish. Fishing from shore and from kayaks are also common uses.

Visitors have many opportunities for wildlife viewing and other outdoor recreational activities in and around this area. Nearby parks include Roads End State Recreation Site in Lincoln City and Knight Park which is located along the Salmon River. Hiking trails atop Cascade Head afford views overlooking the site. Much of the land around Cascade Head and the Salmon River is protected. The Cascade Head Experimental Forest and Scenic Research Area were designated as a Biosphere Reserve as part of UNESCO's Man and the Biosphere program in 1980 (USFS). Common non-consumptive uses in and around the Cascade Head site include hiking; kite flying on beaches; SCUBA diving; wildlife viewing; water sports including surfing, stand-up paddle boarding, and kayaking; and general beach use.

Ongoing human dimensions research will provide us with more insights into the communities of interest and place associated with the Cascade Head site. This research will also provide us with a better understanding of the consumptive and non-consumptive uses and users of the Cascade Head site and the region. You can find more information in Chapter 5 on the human dimensions research being conducted.

C. DESIGNATION HISTORY

Marine reserve discussions began at the state level in the year 2000, through the Oregon Ocean Policy Advisory Council (OPAC), under the direction of then Governor Kitzhaber. Marine reserves planning began in March 2008, with Governor Kulongoski issuing Executive Order 08-07 and a letter to OPAC. The Governor asked OPAC to lead a public nomination process, with assistance from state agencies, and to forward recommendations for up to nine sites to be considerd for marine reserve designation. OPAC proceeded by soliciting proposals from local community groups and individuals. In the summer of 2008, twenty marine reserve site proposals were submitted by the public to OPAC. After thorough consideration, OPAC forwarded recommendations to the Governor in November 2008 including:

- Two sites be designated immediately as pilot marine reserve sites (Redfish Rocks and Otter Rock).
- Three sites undergo further evaluation and community dialogue as potential marine reserve sites (Cape Perpetua, Cascade Head, Cape Falcon).
- One area undergo a local community process, led by the International Port of Coos Bay, to consider developing a new marine reserve proposal (Cape Arago).
- The OPAC August 19, 2008 Oregon Marine Reserves Policy Recommendations.

In 2009, the Oregon Legislature passed House Bill 3013 (HB 3013) directing state agencies to implement the OPAC recommendations. The Legislature also approved funding and dedicated staffing for state agencies to carry out the evaluation and implementation of marine reserve sites.

In 2010, in accordance with HB 3013, ODFW formed three community teams. The teams included prescribed representation from a spectrum of stakeholder interests to further evaluate potential marine reserve sites at Cape Perpetua, Cascade Head, and Cape Falcon. Each team met over the course of 11 months, evaluating the original proposal recommended by OPAC in 2008. The evaluation consisted of determining whether the site could meet sideboards established in Executive Order 08-07, namely: was the site was large enough to allow scientific evaluation of ecological benefits, but small enough to avoid significant economic or social impacts?

In November 2010, the three community teams forward final marine reserve recommendations to ODFW. The recommendations for the Cascade Head site included changes made to the original OPAC proposal and were made with strong support from the community team. The recommendations were the product of extensive community team discussions and many carefully-considered compromises. The final recommendations for the site included a marine reserve plus specific allowances and prohibitions for three MPAs surrounding the reserve.

In December 2010, ODFW used the community teams' recommendations and information gathered throughout the community team process to forge marine reserve recommendations in consultation with OPAC. Following discussion and careful deliberation, OPAC reached a consensus supporting ODFW's recommendations for marine reserve sites. ODFW then forwarded the OPAC approved recommendations to coastal State Legislators.

During the 2012 legislative session, the Oregon Legislature passed Senate Bill 1510 (SB 1510) directing

state agencies to implement ODFW's recommendations for sites at Cape Perpetua, Cascade Head, and Cape Falcon. SB 1510 also provided that an evaluation and a report to the Legislature be provided on the Oregon Marine Reserves Program by March 1, 2023.

In the latter half of 2012, state agencies adopted marine reserve and protected area administrative rules for the Cape Perpetua, Cascade Head, and Cape Falcon sites. The harvest restrictions at the Cascade Head site became effective on January 1, 2014, following two years of baseline data collection for the site.

CHAPTER 5. MONITORING & RESEARCH
APPROACHES, STRATEGIES, & PROCEDURES FOR RESEARCHERS

"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." -- OPAC 2008

The Oregon Legislature has placed the Oregon Department of Fish and Wildlife (ODFW) in charge of the scientific monitoring and research of Oregon's marine reserves. We study both the ecology and the human dimensions of the reserves. This is a long-term research and monitoring program. What we're learning from this work is being used to support the management of marine reserves and sustainable nearshore ocean resources and coastal communities here in Oregon, now and into the future.

The ODFW Marine Reserves Program works in collaboration with numerous research partners to study both the ecology and the human dimensions of the reserves. Questions our research is looking to an-

ECOLOGICAL MONITORING

Oregon's marine reserves are living laboratories where we are learning about Oregon's nearshore ocean environment and the effects that reserve protections - no fishing and no ocean development - have over time on species and habitats.

HUMAN DIMENSIONS RESEARCH

Our human dimensions research looks at the different types of effects that occur over time - to communities, social groups, individuals, and regions - when we set areas aside for conservation and cease fishing in those area.

"Use ... research and monitoring information in support of nearshore resource management and adaptive management of marine reserves."
-- OPAC 2008

swer include how do marine reserve protections — no fishing and no ocean development — affect marine species and habitats? How do these protections affect people and communities? How do people value and depend on the ocean? What else can we learn about Oregon's nearshore marine ecosystem?

This is a long-term monitoring and research program. As prescribed in Oregon's marine reserve mandates, what we're learning from this work is being used to support the management of marine reserves as well as the management of nearshore ocean resources, now and into the future (OPAC 2008; see Chapter 2, B.3).

In this chapter we describe the ODFW Marine Reserves Program's approach to scientific monitoring and research. We also provide information for researchers who may be interested in conducting research in connection with Oregon's marine reserves. And finally, we outline the management strategies ODFW is committed to carrying out for sharing information and engaging communities with regards to monitoring and research.

DID YOU COLLECT BASELINE DATA BEFORE THE RESERVE CLOSED TO FISHING?

Yes, we began collecting data for the Cascade Head Marine Reserve in 2012, two years prior to harvest restrictions taking effect.

A. OUR APPROACH

A.1 A LONG-TERM MONITORING AND RESEARCH PROGRAM

ODFW is implementing ongoing, long-term monitoring and research that is dedicated to learning about marine reserves and the nearshore ocean here in Oregon. We are studying both the ecology and the human dimensions of the reserves. What we're learning from this work is being used to support the management of marine reserves as well as sustainable nearshore ocean resources and coastal communities here in Oregon

In the year 2023, there will be an evaluation of the Oregon Marine Reserves Program and a report submitted to the state Legislature (ORS; see Chapter 2, C). There is general agreement from the scientific community that this evaluation timeframe is too brief for detection of substantive ecological changes due to marine reserve protections. With Oregon's temperate marine ecosystem, scientists project a minimum of 10-15 years after extractive activities (e.g., fishing) have ceased before we might begin to scientifically detect any ecological changes. However, this duration will allow us time for constructive ecological research that helps inform marine reserves science and nearshore resource management here in Oregon.

MONITORING PLANS

We have developed both ecological and human dimensions monitoring plans for Oregon's marine reserves. These are long-term monitoring plans that describe our research questions, sampling designs, sampling activities, and sampling frequencies currently through the year 2023. These plans are reviewed and updated at least every five years, and are available from the Resource Library we've created on the state's Oregon Marine Reserves website at oregonmarinereserves.com/library.

HOW DO WE PRIORITIZE?

Since we have finite resources available, we prioritize our monitoring and research activities based on: the goals and objectives of the marine reserves (OPAC 2008; see Chapter 2, B.3), scientific accuracy, and cost. We strive for rigorous scientific monitoring and research that provides information to support marine reserves and nearshore ocean management here in Oregon, and will be of substance in the 2023 Program evaluation.

EXPLORE MORE ABOUT THE SCIENCE

NEWS FROM THE FIELD
OREGONMARINERESERVES.COM/NEWS

RESEARCH PLANS AND REPORTS
OREGONMARINERESERVES.COM/LIBRARY

THE SCIENCE OF MARINE RESERVES
DOWNLOAD THIS BOOKLET produced by PISCO providing a great introduction to the science of marine reserves

A.2 RESEARCH PARTNERS

We work in collaboration with a variety of partners to scientifically study and monitor Oregon's marine reserves. Our research partners provide advice, lend different expertise, and help us expand our monitoring programs. They include folks from state and federal agencies, academia, non-government organizations, the private sector, the fishing industry, and volunteers.

A.3 EACH SITE IS UNIQUE: 5 CASE STUDIES

Each of Oregon's marine reserves is unique. They are different shapes and sizes. They have distinct habitats and biological characteristics. They each experienced different types and levels of fishing before closure. And, the demographics of the coastal towns and communities most closely tied to each site are different.

These unique features mean we will likely see different effects at each site. While we strive to use similar sampling methods among all reserves, we recognize the need to tailor monitoring strategies to each site. By considering each reserve as a distinct case-study, we aim to inform stakeholders about how specific reserves may vary in response to protections based on their characteristics and placement. The outcome of this case study approach will enable Oregonians to learn and adapt how to best use marine reserves as a management tool into the future.

A.4 LEARNING AND ADAPTING

Marine reserves are a relatively new management tool here in Oregon. Based on what we are learning, our scientific monitoring is evolving and being adapted over time in order to produce the most robust data possible. We continue to ask questions about the ability of our monitoring methods to generate valid and unbiased data about the marine ecosystems in the reserves and regarding the human dimensions of marine reserve implementation. Our goal is to constantly seek to improve our monitoring methods based on the best-available science.

A.5 SHARING WHAT WE LEARN

An important component of the ODFW Marine Reserves Program is sharing what we're learning along the way. Our monitoring plans are reviewed and updated at least every five years. These updates reflect, and are a means of recording the adaptations we make to our monitoring approaches based on the best available science and our experiences. We are also producing monitoring reports at least every two years. In section D, we outline additional strategies we are employing to keep constituents, partners, and decision makers informed about the science being performed, what we are learning, and how that information is being used to support management.

A.6 OPPORTUNITIES FOR ADDITIONAL RESEARCH

There are additional research questions beyond ODFW's current focus that could greatly add to what we might learn from Oregon's marine reserve sites. We continue to look for ways to attract researchers and resources to answer some of these additional research questions -- especially those questions that have strong interest from local community members, the scientific community, and fishermen. We highlight some of the opportunities for additional research for the Cascade Head Marine Reserve in Chapter 9.

"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."

-- OPAC 2008

B. OUR MONITORING AND RESEARCH PROGRAMS

The ODFW Marine Reserves Program is studying both the ecology and the human dimensions of the reserves. Here we provide an overview of the approaches we are using in our respective ecological monitoring and human dimensions research programs.

B.1 ECOLOGICAL MONITORING

LIVING LABORATORIES

Oregon's marine reserves are living laboratories where we are learning about Oregon's nearshore ocean environment and the effects that protections — no fishing and no ocean development — have over time on species and habitats. We conduct robust, long-term monitoring and novel research in these living laboratories to support marine reserve and ocean management.

Here we outline the pertinent marine reserves mandates that drive our ecological monitoring approach (OPAC 2008; see Chapter 2, B.3):

- 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.
- Protect key types of marine habitat in multiple locations along the coast to enhance resilience of nearshore ecosystems to natural and human-caused effects.
- 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.
- 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.

WHAT ARE WE FOCUSING ON?

- **LONG-TERM MONITORING OF MARINE COMMUNITIES** We are conducting long-term monitoring of fish, invertebrate, and macroalgal (seaweed) communities. We are tracking changes over time in organism size, organism abundance, and community composition.

- **METHODOLOGY DEVELOPMENT** We are building upon advances in sampling technology and gear to design robust and contemporary survey tools that are able to effectively sample in Oregon's challenging nearshore marine environment.
- **NEARSHORE RESEARCH** We are supporting research that expands our understanding of Oregon's nearshore environment that can be used to inform management of marine resources within state waters.

This approach ensures we establish long-term datasets in the reserves, using the best available methodologies, while also pushing discovery and our understanding of the nearshore environment. Over time, we will be gaining a better understanding of each of Oregon's five marine reserve sites and have data and information that helps inform nearshore management at large.

DESIGN AND PLACEMENT MATTERS

Oregon's reserves vary in their size, habitats, depths, and past fishing pressure — important characteristics that can influence ecological responses to reserve protections. Where possible, we collect data using the same sampling tools at all five reserves to allow for comparisons across the entire reserve system. However, the unique characteristics of each reserve requires that we use different sampling approaches and tools in order to sample the marine communities present at each particular site. We have therefore tailored our sampling approaches and monitoring activities for each site, which you can find in our Ecological Monitoring Plan (2017) .

WHAT MAKES CASCADE HEAD UNIQUE?

The Cascade Head Marine Reserve includes complex rocky reef habitats, and experienced relatively high levels of fishing pressure on groundfish before closure. The wide variety of habitats and depths in the reserve provide protections to an assortment of previously harvested fish species. The rocky reef habitats protected within the reserve also extend further south into the South MPA and beyond all the way down to Government Point (see Fig 2 in Chapter 4).

LEARNING AND ADAPTING

We are continuing to ask questions about the ability of our sampling methods to generate robust, valid, and unbiased data about the marine ecosystems in the reserves. We are exploring what environmental, habitat, or oceanographic features could confound or bias our datasets. Ultimately, we are aiming to develop robust and replicable standards that can and will be used through time to evaluate reserve effects.

HOW LONG TO DETECT CHANGES?

10-15 YEARS MINIMUM

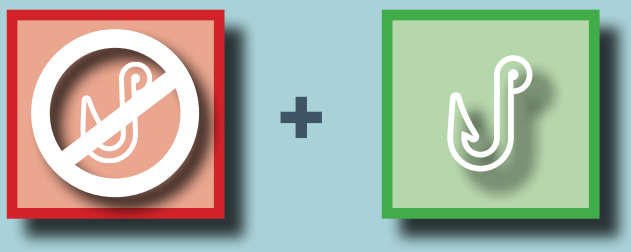
Because of Oregon's cold water and temperate marine ecosystem — where many species are long-lived and slow to grow and mature — scientists project a minimum of 10-15 years after protections (i.e. no fishing) have begun before we might begin to scientifically detect any ecological changes. In the interim, the data we're collecting is being used to support the management of Oregon's marine resources and advance marine reserves science.

OUR MONITORING APPROACH AT CASCADE HEAD

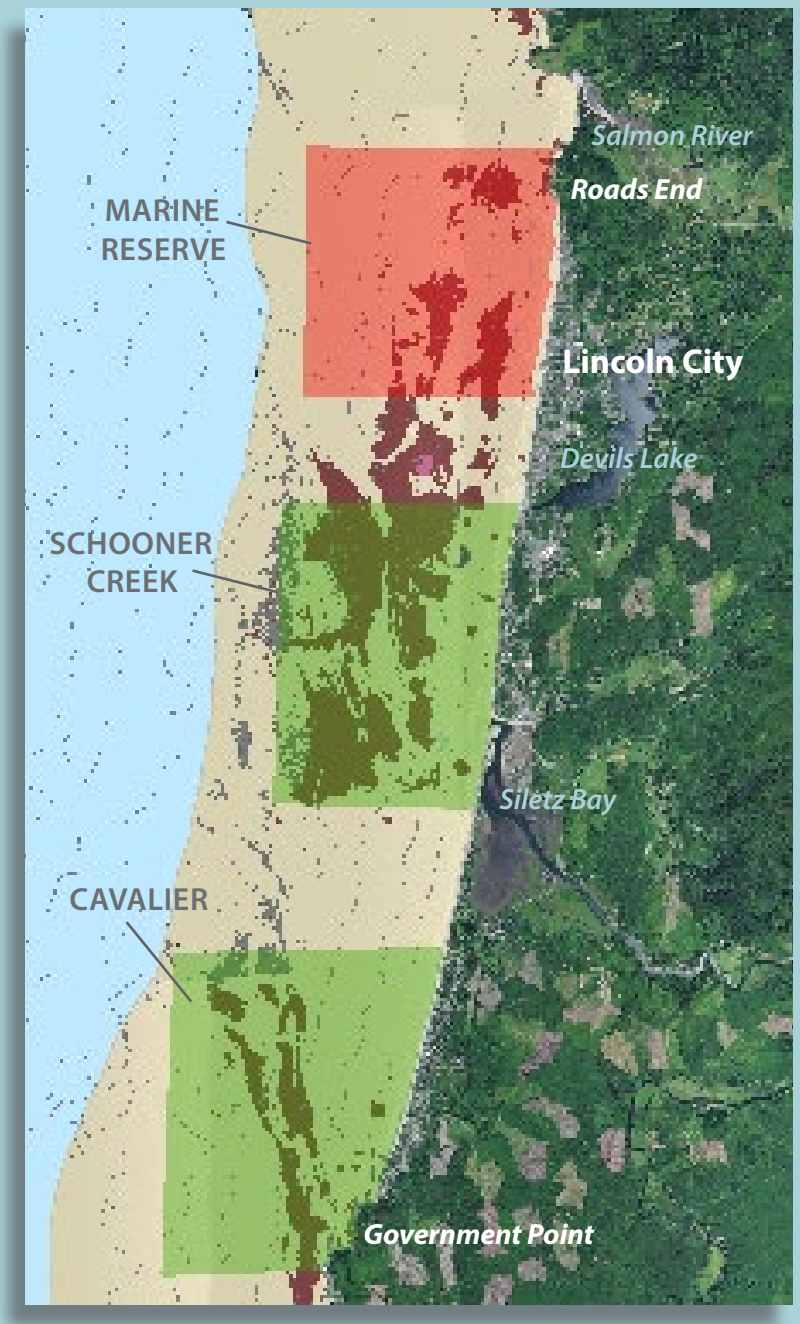
The design and placement of the reserve at Cascade Head allows us to evaluate how marine species respond to reserve protections — i.e. no fishing — compared to areas still open to fishing. We began sampling in 2012, two years prior to the reserve being closed to fishing.

We are monitoring both inside the reserve and outside in three "comparison areas" that are open to fishing and have similar habitats and depths, and experienced similar fishing activity, to that of the reserve. We are tracking changes in organism size and abundance, as well as community composition, and comparing the magnitude and direction of any observed changes between the reserve and comparison areas over time. This allow us to separate out changes due to marine reserve protections from those due to natural variations in the ocean.

WE SAMPLE IN THE



MARINE RESERVE + COMPARISON AREAS



Find more information about our monitoring activities for the Cascade Head site in our 2017 Ecological Monitoring Plan.

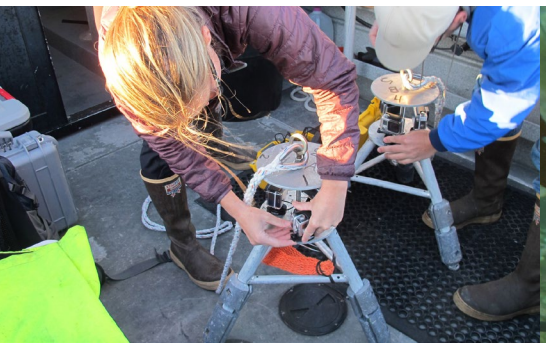
SAMPLING TOOLS AT CASCADE HEAD

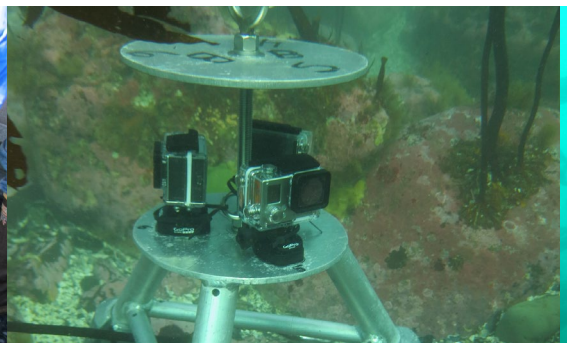
We are using a suite of four sampling tools, tailored to the unique characteristics of the Cascade Head site, to get a more complete picture of the marine environment.

HOOK AND LINE

TOOL USAGE	
DEPTH RANGE	10-40 m
HABITATS	Rock
SAMPLING LIMITATIONS	Calm sea states, availability of volunteer anglers
WHAT DATA ARE WE COLLECTING?	Fish species, fish size, catch rates (CPUE), oceanographic conditions

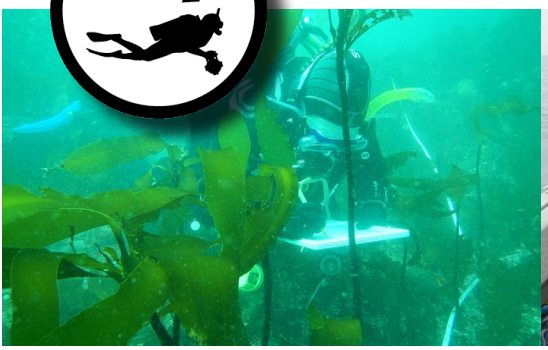
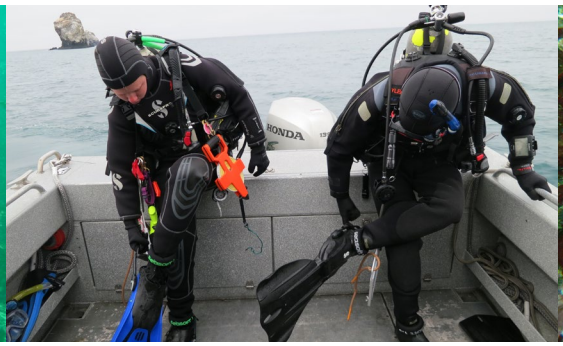
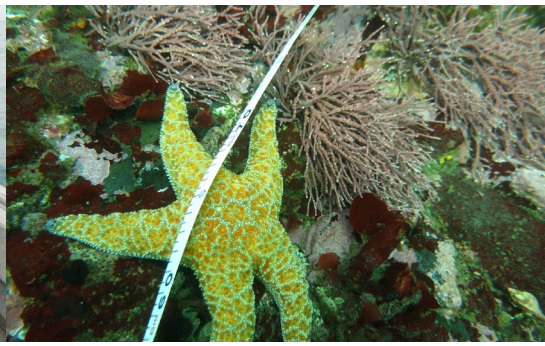
VIDEO LANDER





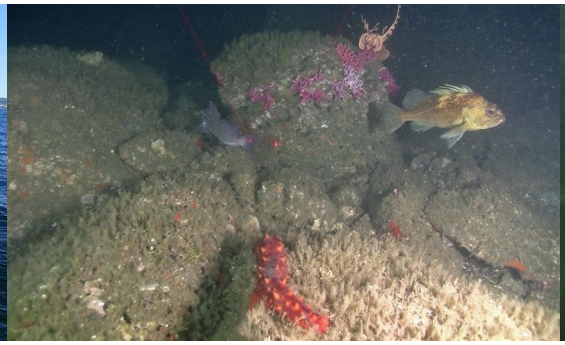
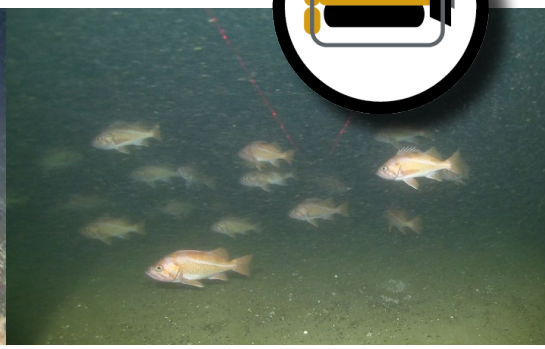
TOOL USAGE	
DEPTH RANGE	5-20 m
HABITATS	All habitat types
SAMPLING LIMITATIONS	Calm sea states, minimum visibility of 3 m
WHAT DATA ARE WE COLLECTING?	Relative abundance of fish and select invertebrates, habitat characteristics

SCUBA

TOOL USAGE	
DEPTH RANGE	10-20 m
HABITATS	Shallow rock
SAMPLING LIMITATIONS	Calm sea states, minimum visibility of 3 m, availability of volunteer divers
WHAT DATA ARE WE COLLECTING?	Fish, invertebrate, and macroalgae counts. Fish size. Species densities. Habitat characteristics.

REMOTELY OPERATED VEHICLE (ROV)

TOOL USAGE	
DEPTH RANGE	20-50 m
HABITATS	All habitat types
SAMPLING LIMITATIONS	Calm sea states, minimum visibility of 3 m
WHAT DATA ARE WE COLLECTING?	Fish and invertebrate species. Abundance for each fish species and for select invertebrates. Habitat characteristics.

"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."

-- OPAC 2008

B.2 HUMAN DIMENSIONS RESEARCH

WHAT IS HUMAN DIMENSIONS RESEARCH?

Human dimensions research looks at the different ways in which humans use, value, and depend on their natural environment. Oregon's marine reserves are a staging ground for studying the human social interactions that surround natural resource issues. This "natural laboratory" is valuable for understanding the current and long-term impacts of conservation and management decisions on people and communities, as well as the impacts demographic shifts, gentrification, and socio-economic changes have on the lives of Oregonians. What we're learning from this research is being used to support future nearshore resource management and policy decision making, and adaptive management of marine reserves here in Oregon.

WHAT ARE WE STUDYING?

Our research focuses on understanding the different ways that people and communities may be affected by the marine reserve sites over time. When conservation strategies such as marine reserves are introduced they can create positive, negative, or no changes for individuals and for communities. Negative changes may include loss of income for businesses or fishermen; increased feelings of distrust towards government; or increased animosity between neighbors with different ideological perspectives on environmental issues. Positive changes may include increased tourism dollars to small businesses in communities near reserve sites, cultural shifts towards feeling closer to nature, or increased awareness about the ocean and ocean issues.

The marine reserves mandates that propel our research questions and approach include (OPAC 2008; see Chapter 2.B.3):

- Site fewer than ten marine reserves and design the system in ways that are compatible with

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.

- ... Use the research and monitoring information in support of nearshore resource management and adaptive management of marine reserves.

RESEARCH QUESTIONS Stemming from these mandates, the following research questions were developed by ODFW in consultation with the Scientific and Technical Advisory Committee (STAC) and additional economics and social science experts to guide our human dimensions research.

1. Are people knowledgeable about the marine reserves?
2. What are the public's attitudes about the marine reserves?
3. What are the economic impacts of the marine reserves on fishermen?
4. What are other significant economic impacts of the marine reserves on local communities?
5. What are the social impacts of the marine reserves?

We also want to know if these change over time, and if long-term impacts are different from short-term or initial impacts.

BROADER QUESTIONS We have also developed a set of broader research questions aimed at increasing knowledge and understanding of social relationships that can be used to support nearshore resource management and policy in the future.

1. How do social and cultural values shape the way communities manage and relate to the ocean?
2. How do coastal communities adapt to social, political, or ecological change?
3. Under what circumstances is it possible for different stakeholder groups to come together and make difficult decisions about ocean management?
4. How do we build community resilience to risk?

OUR APPROACH

We work in close collaboration with a number of research partners from universities and the private sector. Together, we study the human dimensions of marine reserves through multiple social scientific methods - including economics, sociology, anthropology, political science, and psychology. Some of our studies provide quantitative information, while others provide qualitative or descriptive information. These partners also provide advice, lend different expertise, and help us round out our research program.

TYPES OF RESEARCH PROJECTS

Our human dimensions research falls into four different categories. We are conducting a variety

of scientific studies in each of these categories to help us address the research questions described above, and to understand the variety of effects marine reserve sites may have on people and communities.

1. CHARACTERIZATIONS OF COMMUNITIES

We develop general characterizations of the coastal communities most directly tied to each of the marine reserve sites. Characterizations include information such as historical records, demographics such as employment data, social structure, tribal or spiritual connections, cultural and social events, and economic drivers of the local economy. These characterizations set the "back story" and provide context to help us understand effects we might observe over time for these communities.

2. DIRECT USES OF COASTAL ENVIRONMENTS

Fishing:

To understand commercial and recreational fishing patterns associated with marine reserve areas, our studies analyze existing data from sources such as logbooks and fish landings, as well as new data collected from observations, interviews, and surveys. These analyses allow us to identify physical areas of use, which fisheries were conducted in these areas, and which communities may be affected from displacement or disruption of these activities.

Recreation and Aesthetic Engagement:

To understand other types of recreational use and aesthetic engagement with the coast, we gather existing and new data from visitor interviews and surveys. This allows us to understand what uses presently exist, and to monitor changes which may occur with implementation of the marine reserve site. Social and economic data are also collected from the users of these areas.

3. ATTITUDES AND PERCEPTIONS OF IMPLEMENTATION AND MANAGEMENT

To assist in management of the reserves, we are looking to understand the knowledge, attitudes, and perceptions of stakeholders, coastal businesses, and other Oregon residents pertaining to marine reserves purpose, regulations, monitoring and research, management, outreach, and enforcement. Collecting this information also allows us to tailor our marine reserves outreach to better serve Oregonians and engage community members and stakeholders in the implementation of these areas.

4. SOCIAL AND ENVIRONMENTAL VALUES

To gain a more complete understanding of how Oregon residents value the ocean and the marine reserves, this research examines the values associated with the natural resources and ecological characteristics of these areas, as well as how these values may be different across stakeholders, communities, and among the general public.

EXPLORE MORE HUMAN DIMENSIONS RESEARCH

You can explore more about the Human Dimensions Research being conducted by ODFW and our partners on the state's website at oregonmarinereserves.com/science/human-dimensions. You can also find research findings in infographics, reports, and more in our Resource Library.

ATTENTION RESEARCHERS!

Are you a scientist interested in conducting research in connection with the Cascade Head site or any of Oregon's other reserves? If so, we're interested in hearing from you. Please note that some research activities may require a permit.

Please see Chapter 7, section D to determine if your research will require a permit and for instructions on how to apply.

C. PROCEDURES FOR RESEARCHERS

Scientific take of organisms (e.g. fish, invertebrates, and algae) or disturbance of habitats (e.g. equipment attached to the seafloor or in rocky intertidal habitats) is only permitted if deemed necessary and the research contributes to the evaluation of marine reserve site condition, effectiveness, or the impact of stressors (OPAC 2008; see Chapter 2, A.2 and B.1). Researchers should refer to Chapter 7, section D to determine if your research will require a permit, and for instructions on how to apply.

In addition, researchers are urged to review the guidelines and best practices provided in Chapter 8, established by the U.S. Fish and Wildlife Service, to avoid or minimize human disturbance to wildlife using offshore islands and rocks that are a part of the Oregon Islands National Wildlife Refuge.

Please contact ODFW Marine Reserves Program staff if you have any questions or would be interested in exploring possible collaborations. Our staff contact information can be found on the Oregon Marine Reserves website at oregonmarinereserves.com/team.

"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."

-- OPAC 2008

D. STRATEGIES FOR SHARING INFORMATION & ENGAGING COMMUNITIES

In this section we outline the management strategies ODFW is committed to carrying out for sharing information and engaging communities with regards to monitoring and research of the Cascade Head site. These strategies have been developed based on feedback and input we have received from local community members, fishermen, and scientists as well as other interested members of the public. We anticipate these strategies will evolve and be adapted over time as we continue to evaluate and learn from our implementation efforts. Changes in strategies will be captured in updates to this site management plan.

D.1 KEEPING TABS ON MONITORING AND RESEARCH

ODFW has developed several strategies to help keep constituents, partners, and decision makers regularly informed about the ecological and human dimensions science being performed, what we are learning along the way, and how that information is being used to support management.

VISIT OUR ONLINE RESOURCE LIBRARY

We have created a Resource Library page for anyone to access marine reserves ecological and human dimensions monitoring plans, monitoring reports, workshop reports, and scientific journal publications produced by ODFW Marine Reserves Program staff and our research partners. The Resource Library is available on the state's Oregon Marine Reserves website at oregonmarinereserves.com/library.

SUBSCRIBE TO OUR E-NEWSLETTER

We have created a "Marine Reserves News" electronic newsletter that we email to subscribers one to two times per month. Each newsletter includes a photo or video along with a brief news story or update on research and monitoring work being conducted by ODFW or our research partners. You can sign-up for the eNewsletter at oregonmarinereserves.com/newsletter.

FIND NEWS ON OUR WEBSITE

We regularly post science news stories and updates on ODFW and partners' monitoring and research activities for the Cascade Head site. News posts can be sorted by category of science (ecology or human dimensions) as well as by marine reserve site. You can browse current and past news posts at oregonmarinereserves.com/news.

LEARN MORE ABOUT THE SCIENCE ON OUR WEBSITE

We have created several pages on the state's Oregon Marine Reserves website dedicated to the ecological monitoring and human dimensions research being conducted, including a photo gallery and video library.

ATTEND A PRESENTATION

Our staff are committed to presenting papers and posters at scientific conferences, professional meetings, and/or webinars a few times each year. Upon request staff may also give science presentations to college students, local community groups, or decision makers.

D.2 USING LOCAL FISHING VESSELS FOR RESEARCH

When and where feasible, ODFW contracts local fishing vessels to serve as research platforms for our ecological monitoring and research work (see mandates in Chapter 2, A.1 and B.4). Contracting with fishermen allows us to use their expertise in vessel operations, in working with different gear types, and in building equipment. We work with local fishermen in order to improve our monitoring efforts and learn from their years of experience, and in depth local knowledge, of the ocean in and around the Cascade Head site.

For the Cascade Head site we contract local vessels for our hook and line and Remotely Operated Vehicle (ROV) surveys. Occasionally there may be other vessel contract opportunities available.

VESSEL CONTRACT PROCESS

In most instances we contract vessels through the state's open competitive bidding process. This entails posting a Request for Proposals (RFP) and then soliciting applications. The RFP outlines the at-sea project, vessel specifications, expectations and deliverables of the captain and any specified crew, and the insurance requirements. The RFP includes application forms to be filled out and submitted by bidders. Applications are scored based on estimated fees; qual-

"Cooperative and collaborative research will be encouraged as well as utilization of fishing vessels as research platforms."

-- OPAC 2008

ifications and experience; and project approach. Applicants should note that they may include the cost of insurance in their bid price. The highest scoring application is awarded the contract. Preference is given in the qualifications and experience segment to local vessels, with captains and crew that have local knowledge of the areas of work. Vessels unable meet vessel requirements or that are determined to be unsafe to conduct the work will not be awarded a contract.

WAYS TO BE NOTIFIED OF CONTRACT OPPORTUNITIES

Once we have an RFP posted, we use several methods for notifying local fishing vessel owners and captains to solicit applications.

- **EMAIL/PHONE/TEXTING NOTIFICATION** For vessel owners and captains that have expressed interest to our staff or have previously bid on a contract with us, we send notifications by email, phone call, or text message based on their stated preference.
- **OREGON MARINE RESERVES NEWS** We include RFP announcements in our "Marine Reserves News" eNewsletter which is emailed to subscribers. You can subscribe to our eNewsletter at oregonmarinereserves.com/newsletter. We also post RFP announcements on our News page on the state's Oregon Marine Reserves website at oregonmarinereserves.com/news
- **OREGON SEA GRANT EXTENSION** We email RFP announcements to Kaety Jacobson, at Oregon Sea Grant Extension, who shares and distributes opportunities for marine scientific research contracts with commercial and charter fishermen.
- **DOCK WALKS** In some instances, particularly for new research projects at the Cascade Head site, our staff will walk the docks in Depoe Bay and Newport to talk to fishermen about the project and hand out applications for those who are potentially interested in applying.

WHERE TO GET AN APPLICATION

We provide several ways for folks to get applications.

- **DOWNLOAD FROM OUR WEBSITE** Applications can be downloaded from the Resource Library page on the state's website at oregonmarinereserves.com/library/#applications.
- **RECEIVE BY EMAIL OR MAIL** You can contact one of our ODFW Marine Reserves Program staff to email you an application, or send you an application in the mail.

D.3 CITIZEN SCIENTISTS

ODFW currently engages citizen scientists in two of our ecological monitoring surveys.

VOLUNTEER ANGLERS

We use volunteer anglers to help us catch groundfish, for which we collect length data, during our hook and line surveys. These volunteers are experienced saltwater anglers willing to spend a full day out on the water helping us catch and sample fish, often in rough ocean conditions.

At the end of the year volunteers receive our "Fish On!" hook and line newsletter. The newsletter provides highlights from the year -- such as biggest and smallest fish caught -- as well as a summary of the data that the volunteers helped us collect. Copies of each year's "Fish On!" newsletter are also available from our online Resource Library page at oregonmarinereserves.com/library/#ecological

VOLUNTEER SCIENTIFIC DIVERS

We use volunteer scientific divers to conduct SCUBA diving surveys in shallow rocky reef areas. These are AAUS certified scientific divers who must then undergo a special survey method training, developed by the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO). The method includes collecting data on fish, invertebrates, and algal communities. The volunteer divers, trainings, and surveys are a collaborative effort between ODFW, the Oregon Coast Aquarium, and Oregon State University.

FUTURE OPPORTUNITIES

As the ODFW monitoring program matures and/or staff and funding resources evolve, opportunities may be explored to develop other citizen scientist opportunities or specific citizen science projects. In addition to those provided by ODFW, there are often additional opportunities or specific citizen science projects hosted by other researchers or entities in and around the Cascade Head site.

CHAPTER 6. COMMUNICATION & OUTREACH

STRATEGIES FOR MARINE RESERVES COMMUNICATIONS & OUTREACH

"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."

-- OPAC 2008

In this chapter we outline our communications objectives and strategies for informing the public about Oregon's marine reserves, the Cascade Head site, and the ODFW Marine Reserves Program's activities.

RAISING AWARENESS ABOUT OREGON'S MARINE RESERVES	MARINE RESERVES PROGRAM ACTIVITIES
EMPHASIS IS ON: • What are marine reserves • Why marine reserves • Where are the marine reserve sites • What can and can't I do in a marine reserve or MPA	EMPHASIS IS ON: • Connecting people to what lies below the surface of the ocean • Connecting people to the scientific research being conducted by ODFW scientists and our research partners • Sharing what we're learning from Oregon's marine reserve sites and how that information is being used

Our communications and outreach will evolve over time as we learn, adapt and build on our current efforts.

A. COMMUNICATIONS STRATEGIES

Here we outline the current communications strategies that ODFW is committed to implementing. Some of these strategies are tailored specifically for the Cascade Head site based on input staff received from local community members and other interested members of the public at site management plan workshops, from written comments, and from one-on-one conversations.

These strategies have been prioritized based on our marine reserves mandates, our communications objectives, and the staff time and resources we have available. These strategies will evolve over time as we learn, adapt and build on our current efforts. Communications strategies specific to compliance and enforcement are covered in Chapter 7.

A.1 COMMUNICATIONS PRODUCTS

We are committed to developing and implementing the following products to provide communications about Oregon's marine reserve system, the Cascade Head site, and the work of our Program.

OREGONMARINERESERVES.COM WEBSITE	ODFW has created an official state website for Oregon's marine reserves at oregonmarinereserves.com. The website was launched in Spring 2016, and provides information on the marine reserve sites, rules, monitoring and research, and ways for the public to engage. It also includes a Resource Library where folks can download reports, policy documents, outreach materials and more.
E-NEWSLETTER	We have created an electronic newsletter that we email to subscribers 1-2 times per month. The newsletter provides very brief, current updates related to ODFW's research and monitoring work and often includes photos or videos, as well as any marine reserves announcements. You can sign-up for the eNewsletter at oregonmarinereserves.com/newsletter.
NEWS POSTS ON THE WEBSITE	We regularly write and post science news stories and updates for the Cascade Head site on the website. Oregon Marine Reserves News posts can be sorted by category of science (ecology or human dimensions) as well as by marine reserve site. You can browse current and past news posts on the website at oregonmarinereserves.com/news.
BROCHURES	We have informational brochures available for each of Oregon's marine reserve sites, including Cascade Head. There is also a statewide marine reserves brochure that covers all five sites. These brochures are for distribution to local information hubs, for use at tabling events, and for download by the public from the website.

FAQ HANDOUT	We have developed a handout answering the most commonly asked questions regarding marine reserves and the Cascade Head site. These handouts are for distribution at tabling events, for use by docents, and for download by the public from the website.
KIOSK AT KNIGHT PARK	In collaboration with the Salmon Drift Creek Watershed Council, an interpretive kiosk has been installed at Knight Park. The kiosk highlights the marine, terrestrial, and freshwater conservation efforts and opportunities for fishing, wildlife viewing, and other outdoor activities in and around Cascade Head and the Salmon River estuary.
EXHIBIT AT HATFIELD MARINE SCIENCE CENTER'S VISITOR CENTER	We have an exhibit on Oregon's marine reserves, highlighting ecological monitoring activities being conducted by the ODFW Marine Reserves Program and our Oregon State University research partners. The exhibit includes underwater video footage from the marine reserve sites collected during our monitoring activities.
DOCENT TRAININGS	We provide materials and participate annually in the Oregon Parks and Recreation Department's rocky shores trainings for docents. This allows docents, situated at or near marine reserve sites, to provide information to the public about the marine reserves and to emphasize tidepool etiquette for visitors who may want to explore the rocky intertidal areas.
PRESENTATIONS AND EVENTS	We will provide public presentations on Oregon's marine reserves and the Cascade Head site. Preference is for presentations to be given at events or venues with audiences of 20+ people, or for audiences that may not otherwise be reached. Each of our staff are committed to attending 1-2 presentations or events each year.
PHOTO AND VIDEO REPOSITORY	We have created a repository for marine reserves related photos and underwater videos on the website at oregonmarinereserves.com/media.
DOCUMENT RESOURCE LIBRARY	We have created a Resource Library on the website for anyone to access and download ecological monitoring documents, human dimensions research documents, outreach materials, policy and management documents, as well as applications for vessel contracts. Visit the Resource Library on the website at oregonmarinereserves.com/library.

A.2 LOCAL COMMUNICATIONS PATHWAYS

For the Cascade Head site, we received input on local communications pathways for sharing marine reserves information and engaging with members in local communities. These are pathways ODFW staff, or others, may wish to consider when conducting marine reserves communications and outreach.

Here we provide a list of the connectors, community events, and information hubs that have identified as examples by the local community.

LOCAL CONNECTORS

There are specific local groups that may act as connectors to larger audiences. Targeting communications to these groups may help expand communications reach.

Examples identified by local community members:

- Salmon Drift Creek Watershed Council
- Nestucca, Neskowin & Sand Lake Watersheds Council
- Pacific City Dorymen's Association
- Fishermen Involved in Natural Energy (FINE)
- Depoe Bay Near Shore Action Team (NSAT)
- Sitka Center for Art and Ecology
- Cascade Head Ranch
- Audubon Society of Lincoln City
- Yaquina Birders & Naturalists
- Citizen planning advisory groups

LOCAL EVENTS

There are local area events that may provide opportunities to reach large local and visitor audiences.

Examples identified by local community members:

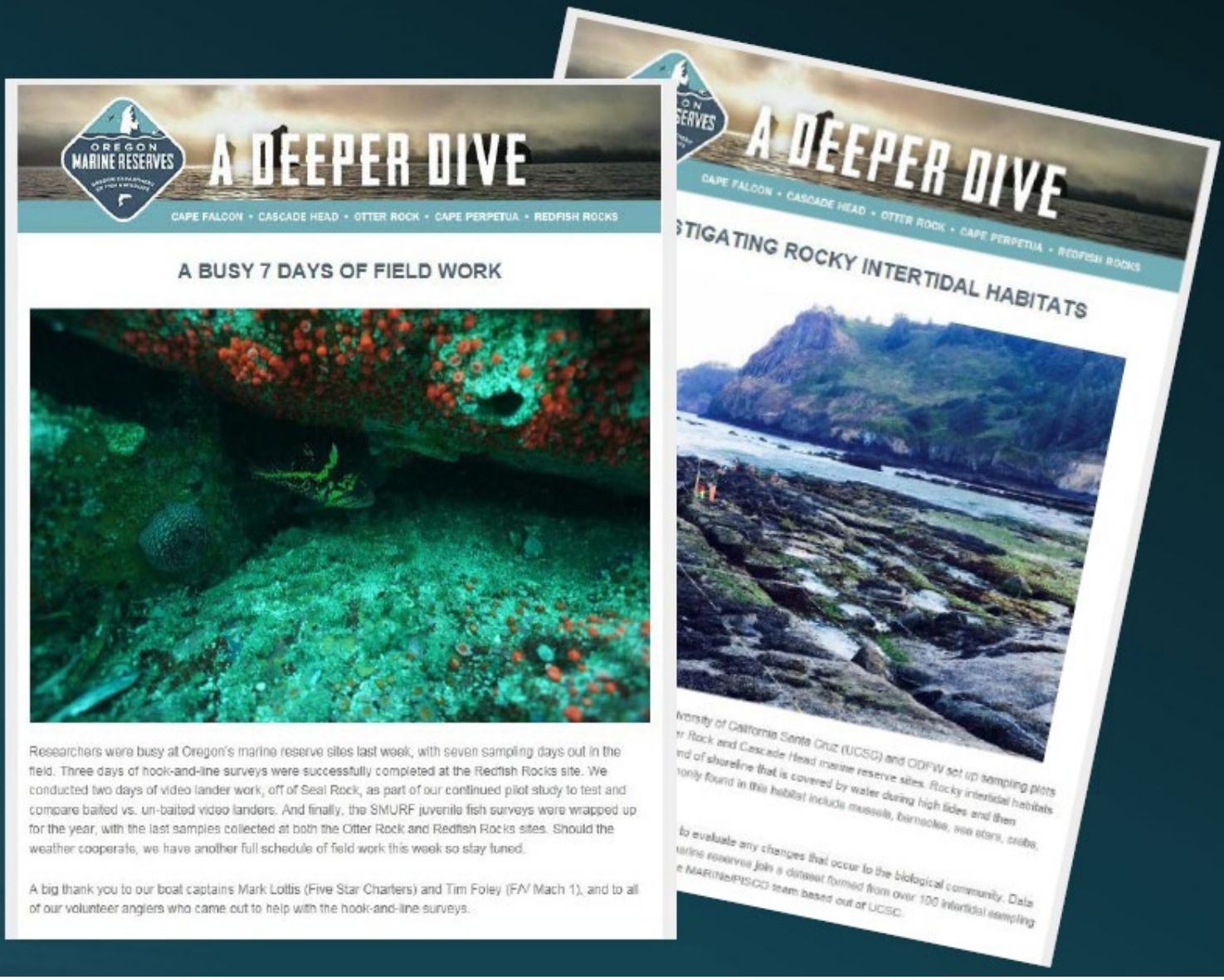
- Pacific City Dory Days Festival
- Pacific City Birding and Blues Festival
- Lincoln City Kite Festival
- Depoe Bay Salmon Bake
- Depoe Bay and Toledo Wooden Boat Shows

LOCAL INFORMATION HUBS

Community members suggested that many folks in their communities get their information from local radio, newspaper, and cable access TV. Communications that use these pathways may be a good way to reach locals. They also described local hubs where people in the community often seek or find information.

Examples identified by local community members:

- Oregon Coast Community College
- Kiawanda Community Center
- Sitka Center
- Camp Westwind
- Panther Creek Community Center
- Chinook Winds Casino
- Lincoln City Cultural Center
- Depoe Bay Whale Watching Center
- Depoe Bay Whale Museum
- Hatfield Marine Science Center Visitor Center
- Oregon Coast Aquarium
- Local grocery stores
- Local farmers markets
- Fishing gear stores


OREGON MARINE RESERVES
A DEEPER DIVE
CAPE FALCON • CASCADE HEAD • OTTER ROCK • CAPE PERPETUA • REDFISH ROCKS
A BUSY 7 DAYS OF FIELD WORK
Researchers were busy at Oregon's marine reserve sites last week, with seven sampling days out in the field. Three days of hook-and-line surveys were successfully completed at the Redfish Rocks site. We conducted two days of video lander work, off of Seal Rock, as part of our continued pilot study to test and compare baited vs. un-baited video landers. And finally, the SMURF juvenile fish surveys were wrapped up for the year, with the last samples collected at both the Otter Rock and Redfish Rocks sites. Should the weather cooperate, we have another full schedule of field work this week so stay tuned.
A big thank you to our boat captains Mark Lottis (Five Star Charters) and Tim Foley (F/V Mach 1), and to all of our volunteer anglers who came out to help with the hook-and-line surveys.
A DEEPER DIVE
CAPE FALCON • CASCADE HEAD • OTTER ROCK • CAPE PERPETUA • REDFISH ROCKS
STIGATING ROCKY INTERTIDAL HABITATS

CHAPTER 7. COMPLIANCE & ENFORCEMENT
STRATEGIES & MANAGEMENT PROCEDURES

"Marine reserves will be adequately enforced.
-- OPAC 2008

In this chapter we outline the management strategies to be implemented by state agencies for supporting compliance and enforcement of the Cascade Head site. These strategies include monitoring and review of enforcement, outreach, procedures for removing lost fishing gear, and procedures for scientists conducting research in marine reserve sites. These strategies have been developed by the Oregon Department of Fish and Wildlife (ODFW) in consultation with Oregon State Police (OSP), Oregon Parks and Recreation Department (OPRD), and Department of State Lands (DSL), along with input from local community members.

We recognize that local communities have a large influence and play an important role in supporting compliance of the marine reserve and MPA rules at the Cascade Head site.

A. ENFORCEMENT STRATEGIES

Enforcement of Oregon's marine reserves is carried out by OSP's Fish and Wildlife Division. Surveillance of sites is conducted from land, by air with assistance from the U.S. Coast Guard, and on the water by boat. OSP is also piloting a livestreaming surveillance camera at the Cascade Head site. This pilot project will help determine if surveillance cameras may serve to assist with marine reserves enforcement.

OSP is monitoring enforcement efforts carried out for the Cascade Head site and using this information to evaluate compliance and enforcement. OSP, ODFW, and OPRD staff are committed to meeting twice per year to review compliance and enforcement efforts and determine if adjustments are needed. Workshops with the fishing fleet, sport fishermen, or local community members may also be conducted when determined to be appropriate or requested as a means of disseminating information or discussing and gaining feedback on specific compliance or enforcement issues.

B. OUTREACH STRATEGIES

In this section we outline the outreach strategies ODFW is implementing to deliver information to commercial fishermen, sport fishermen, and the general public on the prohibitions and allowances of the Cascade Head site.

B.1 MAPS AND RULES SUMMARIES

ON THE OREGON MARINE RESERVES WEBSITE

The following are available on our website at oregonmarinereserves.com/rules or by contacting the ODFW Newport office at (541) 867-4741.

- **MAPS AND RULES** One page handouts that can be viewed and downloaded. Best for fishermen who may be fishing offshore from a boat. The handout provides a map of the Cascade Head site overlaid onto a nautical chart, the site boundary coordinates, and a summary of the prohibitions and allowances in the marine reserve and each of the three MPAs.
- **SHORESIDE MAPS AND RULES** One page handouts that can be viewed and downloaded. Best for folks who may be accessing the marine reserve or one of the MPAs via the shore. The handout provides a schematic map of the Cascade Head site that includes landmarks on land and a summary of the prohibitions and allowances in the marine reserve and each of the three MPAs.
- **OREGON ADMINISTRATIVE RULES (OARS)** The complete set of official Oregon Administrative Rules for Oregon's marine reserves and protected areas (OARs 141-142, 635-012, and 736-029) can be viewed and downloaded.

IN THE SYNOPSIS OF COMMERCIAL FISHING REGULATIONS

Booklet printed annually. We include boundary coordinates, maps, and a summary of the rules for each of Oregon's marine reserve sites.

IN THE OREGON SPORT FISHING REGULATIONS GUIDE

Guide printed annually. We include maps and a summary of the rules for each of Oregon's marine reserve sites in the Marine Zone section under Management Designations for Marine Areas. The guide is also available electronically at www.eregulations.com/oregon/fishing.

B.2 DOWNLOADABLE COORDINATES FOR DIGITAL DEVICES

We have marine reserve and MPA boundary coordinates available for download for some more commonly used digital devices. The following are available from the Oregon Marine Reserves website at oregonmarinereserves.com/rules or by contacting the ODFW Newport office at (541) 867-4741.

FOR GPS

The following formats are available to download for hand held GPS units.

- **GPX FILE** Used by most Garmin products.
- **PRINT FILE** A printable pdf file with all coordinates for each site. Can be used to hand enter coordinates into your GPS unit.

FOR MAPPING PROGRAMS

The following formats are available to download.

- **KMZ FILE FOR GOOGLE EARTH** The file can be imported into Google Earth "My Places."
- **LAYER PACKAGE FOR ESRI ARCGIS** The layer package includes shapefiles of the site boundaries.

FOR VESSEL NAVIGATION SYSTEMS

ODFW has worked with the Oregon Fishermen's Cable Committee (OFCC) to develop boundary coordinates and rules summaries that can be downloaded for some of the more common vessel navigation systems used by Oregon's commercial fishing fleet. These are available for download as a .zip file from the website for use with the following systems:

- Maptech Offshore Navigator
- Rose Point Coastal Explorer
- Nobeltec Visual Navigation suite/Odyssey Time Zero
- OLEX
- P-Sea WindPlot II

There is also a separate instructions file to download that provides detailed instructions on how to load the boundary coordinate files for each specific navigation program.

ODFW and OSP also distributed electronic thumb drives containing these boundary coordinate files during commercial crab hold inspections at the start of the 2013-14, 2014-15, 2015-16 , and 2016-17 crab seasons.

Fishermen can also obtain a thumb drive by stopping by or calling the ODFW Newport office at (541) 867-4741.

WHAT ARE THE PENALTIES FOR VIOLATIONS?

Penalties for violations pertaining to fish, invertebrates, or wildlife within reserves are dictated by the wildlife code (Chapter 496) and commercial fishing code (Chapter 506) within Oregon Revised Statutes.

B.3 SIGNS

Two types of regulations signs have been developed and are posted at strategic locations near boat ramps and beach access points. Locations for the signs were decided in consultation with OSP, OPRD, the Depoe Bay Harbor Commission, and the Port of Newport along with input from local community members. ODFW may consider adding sign locations, or changing existing locations, during biannual enforcement reviews (see section A above) based on feedback received from constituents or agency staff.

HARVEST RESTRICTIONS SIGNS

This sign is intended for fishermen who may be fishing offshore from a boat. This sign provides a map of the Cascade Head site overlaid onto a nautical chart, the site boundary coordinates, and a summary of the prohibitions and allowances in the marine reserve as well as in each of the three MPAs. These harvest restriction signs are currently posted at the Port of Newport, Depoe Bay Harbor and Boat Ramp, and at the Knight Park Boat Ramp.

SHORESIDE REGULATIONS SIGNS

Aimed at folks who may be accessing the marine reserve or one of the MPAs via the shore. These shoreside regulations signs are placed at common beach access points adjacent to the Cascade Head site and provide a generalized summary of what activities are prohibited from the shore at that specific location.

B.4 A GUIDE FOR DEVELOPING OUTREACH PRODUCTS

The ODFW Marine Reserves Program has developed an Outreach Guide for folks who are looking to produce marine reserves outreach products. The guide provides guidelines for helping to ensure that maps and rules language on any outreach materials or products, developed by any person or group, is accurate and consistent with outreach products statewide.

Applying these guidelines will help ensure that your outreach products are accurate, up-to-date, and support compliance and enforcement measures. We encourage you to contact our Communications staff early in your development process. Our staff will provide a timely review of products and determine if any other agencies should be included in the review (i.e., Oregon State Police or State Parks).

WHERE TO FIND THE OUTREACH GUIDE

Available on the state's Oregon Marine Reserves website at oregonmarinereserves.com/library/#outreach

HOW TO CONTACT OUR STAFF

Contact information for our Communications staff can be found at oregonmarinereserves.com/team.

ATTENTION FISHERMEN, LOST YOUR GEAR?

Marine reserve rules allow you to retrieve fishing gear that has accidentally drifted into a marine reserve site.

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.

CALL OREGON STATE POLICE AT 1-800-452-7888

C. PROCEDURES FOR RETRIEVAL OF LOST FISHING GEAR

The marine reserve administrative rules (OAR 635-012) include provisions for the retrieval of fishing gear that has accidentally drifted into the Cascade Head site.

C.1 CONTACT 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.

C.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 635-005-0490.
- If the pot(s) do belong to the retrieving vessel, the vessel operator may re-set the pot(s) outside of the reserve area, pursuant to the requirements set forth in OAR 635-005-0490.

WHERE TO FIND MAPS AND RULES

OREGONMARINERESERVES.COM/RULES
or by contacting the ODFW Newport office at (541) 867-4741

Oregon's marine reserve rules prohibit all extractive activities, with an exception for scientific take if the take is deemed necessary and the research contributes to the evaluation of site condition, effectiveness, or impact of stressors.

-- OAR 635-012; OPAC 2008

D. PROCEDURES FOR RESEARCHERS

Oregon's marine reserves prohibit all extractive activities -- including the take of fish, invertebrates, wildlife, or seaweeds as well as the removal or disturbance of non-living marine resources (i.e. habitats). However, marine reserve rules do include provisions for scientific take if the take is deemed necessary and the research contributes to the evaluation of site condition, effectiveness, or impact of stressors (OAR 635-012; OPAC 2008).

The following sections describe which types of research activities require a permit or state authorization for conducting research in a marine reserve and how to apply for the respective permit. Please contact ODFW Marine Reserves Program staff if you have any questions or would be interested in exploring possible collaborations. Our staff contact information can be found on the Oregon Marine Reserves website at oregonmarinereserves.com/team.

Researchers are also urged to review the guidelines and best practices provided in Chapter 8, established by the U.S. Fish and Wildlife Service, to avoid or minimize human disturbance to wildlife using offshore islands and rocks that are a part of the Oregon Islands National Wildlife Refuge.

D.1 PERMIT NEEDED FROM OREGON DEPARTMENT OF FISH AND WILDLIFE

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 and 635-043). "Take" as defined in Oregon Administrative Rule (OAR 635-012) means to "fish for, hunt, pursue, catch, capture or kill or attempt to fish for, hunt, pursue, catch, capture or kill." Take includes the use of all fishing gear and methods that affect an animal's behavior or movement.

APPLICATIONS FOR SCIENTIFIC TAKING PERMITS

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:

- A project overview, 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).

WHEN DO I NEED A PERMIT FROM ODFW?

A Scientific Taking Permit is required from ODFW in order to "take" fish and marine invertebrates for scientific or educational purposes from any waters belonging to the state of Oregon.

-- OAR 635-007 and 635-043

- 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 biologist depending on the research location.

Applications that include research to be conducted within any marine reserve site will undergo an additional review by ODFW Marine Reserves Program staff to determine if the **take is deemed necessary and the research contributes to the evaluation of marine reserve site condition, effectiveness, or impact of stressors** (OAR 635-012).

Permits may take up to eight weeks for processing. For more information or to apply for a permit visit the ODFW website at: www.dfw.state.or.us/fish/license_permits_apps/index.asp.

NOTIFICATION OF RESEARCH ACTIVITY

The Principle Investigator (PI) named on the Scientific Taking Permit must send an email notification to ODFW and OSP at least 24 hours prior to conducting research within a marine reserve site. The PI is required to provide the date of the activity, site location (e.g. Redfish Rocks Marine Reserve), a brief general description of what the activity is (e.g. juvenile fish survey), vessel name and ID number (if applicable), and the species/species groups to be collected.

Please send email notifications at least 24 hours in advance to the following staff:

Cristen.N.Don@odfw.oregon.gov (ODFW)	**TThomps@osp.oregon.gov** (OSP)

WHEN DO I NEED A PERMIT FROM DSL?

An authorization or removal-fill permit from DSL is required for activities that include structures in, on, under, or over the seafloor or the removal, fill, and/or alteration of material. An authorization is also needed for harvest or removal of subtidal kelp and other seaweeds.

-- OAR 141-125

D.2 AUTHORIZATION NEEDED 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's marine reserve rules include provisions for research in marine reserve sites that require authorization or removal-fill permits (OAR 141-142). DSL will only grant an authorization or a removal-fill permit i**f 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 141-125). 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.

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).

Information on how to apply for an authorization or removal-fill permit can be found on the DSL website at www.oregon.gov/dsl/WW/Pages/Permits.aspx or by calling DSL in Salem at 503-986-5200.

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

- Detailed project overview, 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).

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).

NOTIFICATION OF RESEARCH ACTIVITY

The Principle Investigator (PI) named on the Scientific Taking Permit must send an email notification to ODFW and OSP at least 24 hours prior to conducting research within a marine reserve site. The PI is required to provide the date and location of activity, type of activity, vessel name and ID number (if applicable), gear to be used or deployed, and brief description of activity to be performed.

Please send email notifications 24 hours in advance to the following staff:

Cristen.N.Don@odfw.oregon.gov (ODFW)	**TThomps@osp.oregon.gov** (OSP)

WHEN DO I NEED A PERMIT FROM OPRD?

A permit from OPRD is required for scientific research or monitoring activities occuring in the intertidal zone, including extraction of living (i.e., seaweed) and non-living natural products, and activities that may disturb habitats.

D.3 PERMIT NEEDED FROM OREGON PARKS AND RECREATION DEPARTMENT

A permit from the Oregon Parks and Recreation Department (OPRD) is required in order to engage in a prohibited activity (listed below) for scientific research or monitoring purposes within the Ocean Shore State Recreation Area (Ocean Shore) . The Ocean Shore as provided in ORS 390.605(2), means the land lying between extreme low tide of the Pacific Ocean and the statutory vegetation line as described by 390.770 or the line of established upland shore vegetation, whichever is farther inland. It is necessary that the activity be consistent with the purposes of the marine reserve.

Prohibited activities:

a) Collect, pick, cut, mutilate or remove living or non-living natural products (e.g., marine plants, minerals, shells, rocks, and sand);

b) Give or offer food items to any wildlife;

c) Pursue, injure, or molest any wildlife or disturb their habitats;

d) Dig up or remove any soil, sand, rock, or fossil materials; or

e) Disturb or remove any archaeological, cultural, or historical material.

APPLICATIONS FOR SCIENTIFIC RESEARCH PERMITS

Researchers must apply for and obtain an OPRD scientific research permit in order to conduct any of the above prohibited activities within a marine reserve. In addition to the standard information required in the permit application, the following information must be provided:

- Detailed project overview, 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 prohibited 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).

All applications are reviewed by the appropriate OPRD Stewardship Division staff and relevant park staff. For more information or to apply for a permit visit the OPRD website at: oprdpermits.org.

NOTIFICATION OF RESEARCH ACTIVITY

The Principle Investigator (PI) named on the Scientific Research Permit must send an email notification to OPRD and OSP at least 24 hours prior to conducting research within a marine reserve site. The PI is required to provide the date of activity and brief description of activity to be performed.

Please send email notifications 24 hours in advance to the following staff:

Laurel.Hillmann@oregon.gov (OPRD)	**TThomps@osp.oregon.gov** (OSP)

CHAPTER 8. SITE SPECIFIC MANAGEMENT ISSUES
NON-REGULATORY MANAGEMENT STRATEGIES

This Chapter identifies management issues specific to the Cascade Head site and provides non-regulatory management strategies to address the issues in concurrence with the marine reserves goals, objectives, principles, and guidelines (see Chapter 2). Through ongoing management and monitoring efforts we may identify additional issues specific to the Cascade Head site in the future. A review of issues and strategies will be conducted every five years as part of the management review (described in Chapter 3). The review may trigger adaptations to strategies and updates to this segment of the site management plan.

A. WILDLIFE DISTURBANCE: OREGON ISLANDS NATIONAL WILDLIFE REFUGE

The offshore islands, and emergent rocks and reefs located within the Cascade Head 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, juveniles, 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) .

A.1 USFWS GUIDELINES AND BEST PRACTICES

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 to maintain a minimum altitude of 2,000 feet above ground level (AGL) or maintain a one-half nautical 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.

A.2 ODFW STRATEGIES

ODFW looks to assist the 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.

FOR BOATERS, AVIATORS, WILDLIFE VIEWERS, AND THE GENERAL PUBLIC

Provide the public with easy access to USFWS outreach materials and information including their Seabirds of the Pacific Northwest brochure at outreach events and on the Oregon Marine Reserves website at oregonmarinereserves.com/library/#outreach.

FOR SCIENTIFIC RESEARCHERS

Inform researchers looking to conduct research in marine reserve sites about the Oregon Islands National Wildlife Refuge and the guidelines and best practices established by USFWS. Provide contact information for Oregon Islands National Wildlife Refuge staff for questions or consultation.

A.3 ADDITIONAL USFWS RESOURCES

	**VISIT THE OREGON ISLANDS NATIONAL WILDLIFE REFUGE WEBSITE AT WWW.FWS.GOV/REFUGE/OREGON_ISLANDS**
	**FIND A MAP OF THE REFUGE AT WWW.FWS.GOV/REFUGE/OREGON_ISLANDS/MAP.HTML**
	**DOWNLOAD THE PACIFIC NORTHWEST SEABIRDS BROCHURE**
	**LEARN ABOUT THE SCIENCE BEING CONDUCTED AT WWW.FWS.GOV/REFUGE/OREGON_ISLANDS/WHAT_WE_DO/SCIENCE.HTML**
	**OREGON COAST NATIONAL WILDLIFE REFUGE COMPLEX 2127 SE MARINE SCIENCE DRIVE NEWPORT, OR 97365 (541) 867-4550 OREGONCOAST@FWS.GOV**

B. HUMAN INDUCED STRESSORS FOR FUTURE CONSIDERATION

During this initial marine reserves evaluation period (see Chapter 3, section C), implementation of Oregon's marine reserves is being staffed and funded at an austerity level by the Oregon Legislature. With limited resources, the state agencies have prioritized management efforts that are focused on extractive activities (e.g. fishing, ocean development). However, it is recognized that there are additional non-extractive activities that may negatively impact the marine reserve goals of conserving marine habitats and biodiversity; providing a framework for scientific research and effectiveness monitoring; or avoiding significant adverse social and economic impacts on ocean users and coastal communities (OPAC 2008).

Given additional resources, the state agencies should consider a process for identifying and prioritizing additional human induced stressors for specific marine reserve sites and the marine reserve system. Prioritization should include factors such as likelihood of occurrence and severity of impact. The prioritization can then be used by the state agencies to select which stressors need management strategies to be developed and incorporated into management plans.

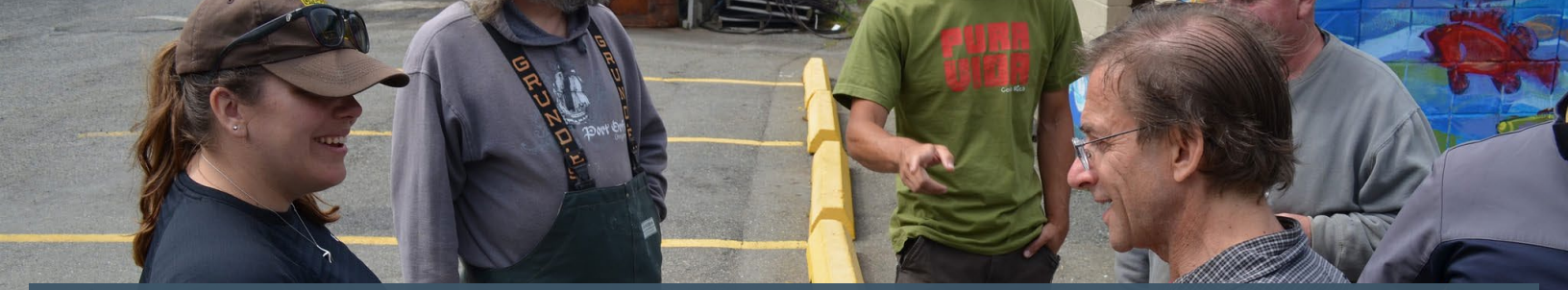
In some instances, we may determine that certain stressors cannot be addressed through non-regulatory management strategies. These may warrant specific discussion during the marine reserves program evaluation in 2023 on if or how to address in marine reserves implementation moving into the future.

During site management plan workshops and public comment for the Cascade Head Site Management Plan, comments were received that identified possible human induced stressors that may warrant future consideration. Here we highlight those stressors as identified by constituents.

Potential human induced stressors at the Cascade Head site:

WATER QUALITY • Bacteria • Herbicides and pesticides • Other (e.g. caffeine, human hormones)	**INVASIVE AND NON-NATIVE SPECIES**
VISITATION • Impacts on intertidal ecology (e.g. trampling) • Impacts on subtidal ecology	**SPORT FISHING OUT OF THE SALMON RIVER IN THE NORTH MPA**

MARINE DEBRIS AND POLLUTION
• Land-based debris
• Derelict fishing gear
• Vessels
  – Wreckage
  – Oil spill
	OTHER SHORESIDE IMPACTS
	• Failing shoreside infrastructure (e.g. septic tanks, eroding pavement)
	• Shoreline armoring



CHAPTER 9. OPPORTUNITIES BEYOND THE AGENCY
REPRESENTING LOCAL COMMUNITY INTERESTS

This Chapter highlights activities and opportunities that are of interest to local communities above and beyond what is being carried out by ODFW and our state agency management partners for the Cascade Head site. These include additional opportunities for research, monitoring, outreach, and community engagement as well as for education and economic development.

By highlighting the communities' interests we hope to attract additional research and resources, and to foster community led projects.

A. IDENTIFYING ACTIVITIES AND OPPORTUNITIES

In developing this site management plan, ODFW was interested in learning what projects or research the community was interested in beyond what is being carried out by ODFW that could complement marine reserves implementation. In particular, we were interested in learning about potential projects that could be led by the community for the Cascade Head site.

Between 2013 and 2016, ODFW gathered input from community members on their interests and ideas for research, monitoring, outreach, community engagement, education, and economic development. Local community members and other interested members of the public identified activities and opportunities during site management plan workshops, in written comments provided to ODFW, and during one-on-one conversations with ODFW staff.

A.1 COMMUNITY WORKSHOPS

During a series of management plan community workshops held in 2013 and 2014, ODFW sought feedback on:

- Ways to improve our communication about the ecological monitoring and human dimensions research activities and results for the Cascade Head site.
- The best ways to share monitoring and research information with the community.
- Projects or research important to community members beyond what is being carried out by ODFW.

These workshops were designed to listen and learn about community interests and were conducted as brainstorming sessions where all ideas were recorded. Workshop attendees recommended more than 50 different research and monitoring ideas for the Cascade Head site and 30

different activities related to outreach and compliance. Summaries from the three workshops are included in Appendix A.

A.2 TYPES OF PROJECTS IDENTIFIED

From the many ideas gathered through the workshops, written comment, and in one-on-one conversations -- those considered to fit within ODFW's mandates (see Chapter 2) and feasible given agency staff and funding resources have been adopted as management strategies in Chapters 5-8 or have been added as research and monitoring activities in ODFW's marine reserves monitoring plans. The other ideas shared have been identified as opportunities beyond the agency and are highlighted in this Chapter. Suggested projects fall into one of three categories:

- **COMMUNITY SUGGESTED RESEARCH** Research or monitoring of interest to the community to be carried out by non-ODFW scientists. The research would likely be led by an agency or academic institution due to complexity and/or expense.
- **COMMUNITY LED PROJECTS** The community provides all support, personnel, and resources needed to develop and perform the project.
- **PARTICIPATORY PROJECTS** Project made available locally that is likely to require resources and/or expertise beyond the community's capacity to develop and lead. Community members participate in the project.

B. RESEARCH AND MONITORING OPPORTUNITIES

Opportunities for research and monitoring identified in this section include ecological, human dimensions, and citizen science projects.

B.1 ECOLOGICAL PROJECTS

The community generated many ideas and suggestions for ecological research and monitoring projects that might complement work currently being carried out by ODFW and our research partners for the Cascade Head site. Recommendations included "Community Suggested Research" as well as existing non-ODFW research projects that might complement ODFW's current marine reserves monitoring efforts. The community also noted that many of the identified projects could use local "vessels of opportunity" -- such as local fishing boats -- that could provide to economic development opportunities related to the Cascade Head site.

COMMUNITY SUGGESTED - HABITAT RESEARCH

The community identified several projects related to studying benthic, rocky intertidal, and estuarine habitats as well as kelp beds. Suggested research included:

- Expanding the current rocky intertidal monitoring and research being conducted.
- Studying any signs and recovery of bottom (benthic) habitat damage.
- Conducting surveys of the kelp bed located in the South MPA.
- Studying interactions between the reserve and the Salmon River estuary. Use of the estuary

by marine species. As a freshwater input into the nearshore ecosystem and how it affects the reserve.

Possible Project Leads:	Universities, NOAA Fisheries, The Nature Conservancy, Multi-Agency Rocky Intertidal Network (MARINe)
Existing Projects:	Juvenile salmon use of the Salmon River estuary led by NOAA Fisheries. Seastar wasting and rocky intertidal monitoring led by The Nature Conservancy and MARINe.

COMMUNITY SUGGESTED - SPECIES RESEARCH

The community identified a number of projects related to species research that they had interest in for the Cascade Head site. Community members expressed that they'd like to see special attention given to species with high economic and cultural value, such as crab and salmon. Suggested research included:

- Developing and using tools to survey species higher up in the water column (e.g. black rockfish, blue/Deacon rockfish, plankton). Collect abundance data for these species.
- Fish movement studies (e.g. acoustic telemetry) to better understand adult home ranges and detect any migratory species (e.g. sharks, sturgeon) utilizing and moving through the Cascade Head site.
- Predator-prey studies (e.g. pinnipeds, lingcod) and food web interactions (including birds and marine mammals)
- Juvenile fish recruitment surveys. Could expand the surveys currently being conducted at the Otter Rock and Redfish Rocks marine reserve sites.
- Genetics research to understand population connectivity.
- Additional research to better understand how fishing effort shift affects local fish populations

outside of the reserve. Look at short-term and long-term effects.

- Crab research including movement studies, determining natural mortality rates, as well as abundance and size structure inside vs outside of reserve.
- Invasive and non-native species surveys.
- Fish parasite load relationships with fish age/size, environmental conditions, and fishing pressure.
- More research aimed at being able to detect any spillover effects outside of the reserve in the future.
- Continue and expand the benthic extraction surveys that were conducted by ODFW during baseline data collection. Collect data on benthic invertebrates and algae.
- Salmon use of the nearshore marine environment.

Possible Project Leads: Universities, NOAA Fisheries, Oregon Coast Aquarium

COMMUNITY SUGGESTED - OCEANOGRAPHIC RESEARCH

Community members identified physical, chemical, and biological oceanographic data to be collected and research projects. They noted that large-scale oceanographic events such as El Nino, La Nina, and ENSO as well as changing ocean conditions such as ocean acidification and nearshore hypoxia can influence marine reserve effects. They also noted that monitoring ocean acidification and hypoxia at the marine reserve site can provide data to inform nearshore resource management more broadly. Suggested research included:

- Expanding data collection of chlorophyll a, temperature, pH, oxygen. Consider if local vessels (e.g. commercial and charter fishing vessels) might be able to collect this data.
- Monitoring for herbicides and pesticides in nearshore waters.
- Real time reporting of oceanographic data for use by fishermen and researchers.

Possible Project Leads: Universities

Existing Projects: Ocean acidification (pH) monitoring in the rocky intertidal on the north end of the marine reserve. Project led by Oregon State University/Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO). This project includes a citizen science opportunity (see B.3).

B.2 HUMAN DIMENSIONS RESEARCH PROJECTS

In natural resource management, human dimensions research looks to understand the ways in which humans' value, use, and depend on the natural environment. The human dimensions research being conducted for the Cascade Head site is looking to understand how communi-

ties, ocean users, and regional economies are affected by implementation of the reserve and to gain a better understanding of the interactions between the economy, marine environment, and communities.

COMMUNITY SUGGESTED - HUMAN DIMENSIONS RESEARCH

Community members suggested the following ideas for human dimensions research projects that might complement the work currently being carried out by ODFW and our research partners for the Cascade Head site.

- Additional research to better understand the different effects that fishing effort shift has on the fishing fleet due to the reserve. How does fishing effort shift short-term and long-term?
- What economic contributions does scientific research bring to the community/local economy?
- Additional research on businesses. Do existing local businesses capitalize on marine reserves? Do businesses capitalize on information being generated for marine reserves? Are there new businesses generated around marine reserves?
- Additional research related to ecosystem services.

Possible Project Leads: Universities, Chambers of Commerce, County Economic Development Offices

B.3 CITIZEN SCIENCE PROJECTS

Community members identified citizen science projects as a good way to engage people in marine reserves implementation. Community members recommended ideas for projects that could be performed by citizen scientists. Some of these projects could be done by folks who, after a little training, are able to perform tasks that contribute to data collection. Some of the projects identified could be done on one's own schedule or wouldn't need active oversight by a professional staff. The recommendations provided included both "Community Led" and "Local" citizen science projects, as well as existing projects community members might plug into.

COMMUNITY LED PROJECTS

Community members suggested the following ideas for citizen science projects that could be led by the community:

- Compiling species lists and photos for the Cascade Head site
- Rocky intertidal and sandy beach monitoring
- Seabird observations
- Marine mammal observations
- Water quality monitoring

Possible Project Leads: The Nature Conservancy, Audubon Society of Portland, CoastWatch, Yaquina Birders and Naturalists, Cetacean Society, Surfrider Foundation, Oregon Beach Monitoring Program, Watershed Councils

Existing Projects: Sea star wasting disease monitoring in rocky intertidal habitats led by The Nature Conservancy and MARINe. Bacteria/non-point source water quality monitoring led by Surfrider Foundation and Oregon Beach Monitoring Program.

PARTICIPATORY PROJECTS

Community suggestions included the following ideas for projects that could be developed for community members to participate in. These projects would likely require external support to develop and lead.

- Volunteer SCUBA surveys
- Oceanographic sensors deployed by commercial and charter fishing boats
- Ocean acidification monitoring

Possible Project Leads: Reef Check, REEF, Universities, Crab Commission

Existing Projects: Ocean acidification (pH) monitoring in rocky intertidal zone. pH sensors are installed and maintained by local volunteers. Led by Oregon State University/PISCO and The Nature Conservancy.

C. OUTREACH AND EDUCATION OPPORTUNITES

We received input on local communications pathways for sharing marine reserves information and engaging with members in local communities which are presented in Chapter 6.B.2. These are pathways ODFW staff, or others, may wish to consider when conducting marine reserves communications and outreach.

Opportunities for outreach and education projects as identified by community members is provided in this section. Recommendations included both "Community Led" and "Participatory" projects.

COMMUNITY LED PROJECTS

Community members suggested the following ideas for projects that could be led by the community:

- Friends of group for Cascade Head site
- Information kiosks
- Video for businesses
- Train volunteers to provide marine reserves materials and information at local community events, make presentations at local meetings, and provide interpretive talks on hikes and outings.
- Develop marine reserves outreach packets to distribute to local businesses.
- Develop media packets for local visitor bureaus.
- Develop a marine reserves best practices certification program for charter vessel operators.
- Docent led boat or hiking tours.
- Promote best practices, such as "leave no trace behind".
- Monitor and report potential violations to Oregon State Police.

Possible Project Leads: Camp Westwind, Sitka Center for Art and Ecology, Salmon Drift Creek Watershed Council, CoastWatch

PARTICIPATORY PROJECTS

Community suggestions included the following ideas for projects that community members could contribute to. These projects would likely require external support to develop and lead.

- Ocean literacy curriculum developed around the Cascade Head Marine Reserve.
- Exhibit for display at the Oregon Coast Aquarium.
- Interpretive signs.
- Boundary markers.
- Data portal for education materials.

Possible Project Leads: Educators, Oregon Coast Aquarium

APPENDIX A. WORKSHOP SUMMARIES

CASCADE HEAD MANAGEMENT PLAN WORKSHOP
NOTES FROM PUBLIC INPUT
December 9, 2013 - Lincoln City Community Center

TOPIC: Best ways for ODFW to communicate ecological monitoring activities and results

This is a summary of the community's questions and ideas captured in a brainstorming session from our first workshop held as part of the development of the Cascade Head Marine Reserve Site Management Plan. Specifically, this first workshop was designed to listen and learn about the community's ideas on how ODFW can be sharing information with the local community about ecological research activities and results from the marine reserve. We asked specific questions on:

- What information would people like to know about the ecology of the marine reserve?
- What information would people like to know about the monitoring activities being conducted at Cascade Head?
- What products would be useful for sharing what we are learning from our ecological monitoring?
- What are local ways to share that information? What people, events, or other pathways?

ODFW will be looking at all these ideas, considering them against the state's marine reserve mandates and what is feasible with our available time and resources. We will identify those ideas to move forward with that best meet our mandates and our available resources. These will be documented in the site management plan as commitment by ODFW to implement those actions.

All non-selected ideas will be documented in the community section of the site management plan and will also be carried forward for further community discussion in additional workshops as part of the site management planning process. We hope that a few of these ideas are identified as community priority projects that could be led by community members or groups.

IDEAS FROM THE PUBLIC

WHAT DO YOU WANT TO KNOW?

- Species maps
  - Where do species live?
- Fish movements
  - What's swimming through the marine reserve (e.g., acoustic tagging)?
  - What species are in the marine reserve?
  - Specifically lingcod movements, both adult and juvenile
- Video – what does it look like in the marine reserve?
  - Live streaming
  - Post short videos on You Tube
- Fun facts
  - Biggest fish
  - Smallest fish
  - Strangest creature
  - Make it fun ("does the wolf eel howl at a full moon?)
- Science
  - Explanation of spillover effect
  - How do scientists determine marine reserves?
  - How have species size and abundance changed over time
  - Food web and predator-prey interactions
  - Lingcod suggested
- Stories to tell about marine reserves
  - Why marine reserves?
  - Benefits of marine reserves
  - Success stories of marine reserves around the world
  - 10 year experiment to learn about marine reserves here in Oregon
  - Value of marine reserves as a no take reference area
- Current fisheries management practices and benefits need to be acknowledged and taken into consideration when determining possible benefits of marine reserve sites. This should be part of the education about the sites. Fish stocks were rebounding at faster than predicted levels before these sites were implemented.
- How will the information collected from the recreational sector, during the Territorial Sea Planning process, be factored into the baseline studies when it was dismissed as "anecdotal" by the body (STAC) that will be leading the 10 year review?

PRODUCTS?

- Hook-and-line volunteer newsletter
- Photos and species lists
  - Species inventory - kids and general public

- Smart phone app
  - Use QR codes can link to marine reserves information
- Blog
  - Post videos
  - Quick messages
  - Short stories
- Volunteers share stories of helping out with monitoring
- Year in the life of a marine reserve
  - Summary of what is happening in the marine reserve
    - Ecologically
    - What research will be conducted in the upcoming year
- Kiosk at Knight Park
- Maps with topography and habitat
- Video clips –on various topics
  - Biodiversity
  - Each reserve site
  - Different research projects

PEOPLE/GROUPS/EVENTS?

- Link data to children
  - Ocean literacy
  - Teachers in Lincoln County
  - REEF (volunteer SCUBA surveys)
  - Salmon Drift Creek Watershed Council
  - Oregon Coast Aquarium
- Docent led walks on Saturdays in summer - access beach from Logan Rd. or other access point
- Groups
  - HMSC
  - NOAA
- Events – single day big community events
  - Depoe Bay
    - Salmon Bake
    - Wooden Boat Show
  - Lincoln City
    - Clam Chowder Cook-off
    - Kite Festival
    - Westwind visitors open house (June 15th)
    - Cascade Head 40th birthday celebration – follow up with Jalene/Dick
    - Devils Lake revival – coho event

PATHWAYS/MECHANISMS?

- Local newspapers
- Guest editorials
- Insert special section
- Local radio
- Oregon Field Guide
- Can also highlight other groups involved and what they're doing
- Cable access TV
- Signage locations
- Information stop along Hwy 101
- City Park trail
- Logan Road and D River
- Internet and Social Media
- Website - better linkage/access between the main ODFW website and the Oregon Marine Reserves website
- I-Fish and other fishing blog spots
- Facebook
- You Tube
- Google Earth with details and photos
- Popular places for information distribution
- Safeway
- Lincoln City Cultural Center
- Visitor centers
- Whale Watch Center (OPRD)
- Whale Museum
- Chinook Winds Casino (Tribal)
- Westwind – also social media link
- Whale watching boats
- Chamber and tourism groups
- Docent trainings

CASCADE HEAD MANAGEMENT PLAN WORKSHOP
NOTES FROM PUBLIC INPUT
March 12, 2014 at the Newport Recreation Center

TOPIC: Best ways for ODFW to communicate Human Dimensions monitoring activities and results

This is a summary of the community's questions and ideas captured in a brainstorming session from our March workshop, held as part of the development of the Cascade Head Marine Reserve Site Management Plan. Specifically, this workshop was designed to listen and learn about the community's ideas on how ODFW can best share information with the local community about human dimensions (social and economic) monitoring activities and results. We asked specific questions on:

- What information would people like to know about human dimensions studies for Cascade Head?
- What products would be useful for sharing what we are learning from our human dimensions monitoring?
- What are local ways to share that information? What people, events, or other pathways?

ODFW will be looking at all these ideas, considering them against the state's marine reserve mandates and what is feasible with our available time and resources. We will identify those ideas to move forward with that best meet our mandates and our available resources. These will be documented in the site management plan as commitment by ODFW to implement those actions.

All non-selected ideas will be documented in the community section of the site management plan and will also be carried forward for further community discussion in additional workshops as part of the site management planning process. We hope that a few of these ideas are identified as community priority projects that could be led by community members or groups.

IDEAS FROM THE PUBLIC

WHAT DO YOU WANT TO KNOW?

- Visitor information
  - What is the monetary value of non-extractive uses of the marine reserve site, such as the big wave surfing competition?
  - How many people come to visit the marine reserve as a destination or specific activity?
    - Destination visitors need to be separated from auxiliary visits when looking at economic impacts/benefits
- How and who will track and ground-truth direct impacts, both positive and negative?
- Why is the marine reserve important to everybody living and/or vacationing on the coast?
- How has fishing effort shifted? What effect(s) does that have?
- Updates on what ODFW is monitoring
- Information about businesses

    - How rapid do businesses capitalize on information around marine reserves?
    - Are there new businesses generated around marine reserves?
- Effects of research
    - What other research is happening in the area by outside groups?
    - Coordinate research between federal, state, and university entities
    - Are researchers attracted there because of the marine reserve?
    - What monetary value does research bring to the community?
    - Will researchers be using local resources and personnel?
- Educational uses
    - What is the use of marine reserves by schools?
    - Are marine reserves promoted and used as living laboratories?
    - Does school use of marine reserves contribute to ocean literacy?
- Information or things to keep in mind while developing products
    - Concerns by fishing communities – be clear on their input into economic models
    - Need general marine reserves information. What can I do? Where to go?
    - Marine reserves in Oregon are an experiment. They are just one possible management tool. They are not the only current tool in use to recover stocks.
    - What other management existed before marine reserve?
    - Knight Park (Salmon River) should be monitored the same as other ports (Pacific City, Depoe Bay, Garibaldi)
    - ODFW's role needs to be neutral. Facilitating promotion and marketing of the sites will lead to distrust and lack of participation by certain sectors.
- Why are ODFW staff tasked with promoting the marine reserves? Sites were promoted to community groups as opportunity for economic development and need/want for community. Why do these communities need assistance?
- Note: Ideas pertaining to ecological research were added to the ecological workshop notes.

PRODUCTS?

- 1 pager or handout
- Be aware that not everyone is computer savvy
- Cookouts – fish recipes
- When boats are in the marine reserve – provide information on what they are doing to the public

PEOPLE/GROUPS/EVENTS?

- Groups
    - Nestucca Watershed Council
    - Salmon Drift Creek Watershed Council
    - Sitka Center
    - Lincoln City Audubon
    - Pacific City Doryman's Association
    - Neskowin Citizen Planning Advisory Group

    - Panther Creek Community Center (Salmon River)
    - Cascade Head Ranch (home group)
        - some members from the community team live there
- Events – single day big community events
- Depoe Bay
    - Salmon Bake
    - Wooden Boat Show
- Lincoln City
    - Clam Chowder Cook-off
    - Kite Festival
    - Westwind visitors open house June 15th
    - Cascade Head 40th birthday celebration – follow up with Jalene/Dick
    - Devils Lake revival – coho event
- Pacific City
    - Dory Days

PATHWAYS/MECHANISMS?

- Local newspapers
    - Guest editorials
    - Insert special section
- Local radio
- Cable access TV
- Popular places for information distribution
    - Safeway
    - Lincoln City Cultural Center
    - Visitor centers
    - Whale Watch Center (OPRD)
    - Whale Museum (Depoe Bay)
    - Chinook Winds Casino (Tribal)
    - Westwind – also social media link
- Events
    - Neskowin Saturday Market
    - Lincoln City Farmers Market
- Whale watching boats
- Chambers of commerce and tourism groups

CASCADE HEAD SITE MANAGEMENT PLAN
WORKSHOP: COMMUNITY PROJECTS AND IDEAS
April 16, 2014 at the Lincoln City Community Center

This is a summary of the community's ideas captured in a brainstorming session from the third workshop held as part of the development of the Cascade Head Marine Reserve Site Management Plan. Specifically this workshop was designed to listen and learn about the community's ideas on what projects or research is important to them. We are particularly interested in learning about potential projects that could be led by the community. By highlighting the community's interests and priorities in the site management plans we hope to attract additional research and resources, and to foster community led projects. Community led projects can be focused on any aspect of marine reserves implementation including research, monitoring, economic development, outreach, or education.

Suggestions for types of projects are broken into two categories :

COMMUNITY SUGGESTED RESEARCH: Ideas for research done by non-ODFW scientists that the community supports and is documented in site management plan.

COMMUNITY LED PROJECTS: Community individual, group, or outside expert lead project. Community provides all support, personnel and resources needed to perform project.

IDEAS FROM THE PUBLIC

*= number of votes from informal dot poll performed by workshop participants

ECOLOGY - COMMUNITY SUGGESTED RESEARCH

- Study signs of bottom habitat damage
- Document fish and plankton species composition in the water column
- * Study fish movements
    - What species are swimming through the reserve (acoustic tagging?)
    - What species are in the reserves
    - Specifically lingcod movements, both adults and juveniles
    - ***Adult spillover from reserve
    - *Larval and young of the year fish, dispersal and movement
    - **Fish home range study – could use acoustic tags
- Food web and predator prey interactions
    - All aspects of reserve - fish, birds, mammals
    - Specifically suggested about lingcod
- Gather recreational fishing data and present any information already gathered
- ***Oceanographic data – monitor chlorophyll a, temp, pH, oxygen
    - Compare sites
    - Monitor and document hypoxic events
    - *El Nino and other large scale events – effects on productivity?

    - ***Can this be done by vessels of opportunity (i.e., fishing boats)?
        - Note: Issues with revealing fishing locations
- **Fish parasites study
    - Black rockfish formerly had lots of parasites but with increased fishing pressure parasites appear to be reduced
    - Study parasite load relationship with fish age, size, growth, environmental conditions and fishing pressure
- *Research on the kelp bed that is in the MPA
- **Genetic work
    - Understand connectivity of reserves (could use fin clips)
- *Crab research
    - Effect of reserves on crab abundance
- *Workshop for experts to create wish list of long-term research projects
- ***Water quality monitoring – beyond bacteria
    - Herbicides and pesticides effects on species
- *Define and monitor ecological indicators (e.g., water quality, species abundance, oxygen, etc.)
    - Display with graphics for showing status of reserves
- Benthic extraction survey – more sites and frequency than ODFW is conducting
    - Study algae and invertebrates
- Invasive and non-native species survey in reserves
- **Surveys to include Salmon River estuary and very nearshore
    - River is a unique feature of this particular marine reserve – should highlight it
- Study salmon use of the nearshore

ECOLOGY - COMMUNITY LED PROJECTS

- Citizen Science
    - *Species sighted/location map
    - Photo and species list for reserve
    - ***Monitor intertidal and sandy beach
    - *Whale monitoring – partner with Whale Watch Spoken Here sites
    - *Tap into Camp Westwind for volunteers for projects
    - Sea star wasting disease monitoring
- Birders in area help collect local data
- Marine mammal monitoring with Marine Mammal Institute lead

HUMAN DIMENSIONS

- Certified marine reserves best practices vessel operators
- Research/visitor center

- Business supported fundraiser
- ***Public tours/excursion - hike, boat all aspects – Docent led
    - Charter boat could sponsor
    - Associate with waterfall view (from boat)
- Service project – promote at visitors bureau
    - People come and help research or volunteer to do something to help

OUTREACH & COMPLIANCE - COMMUNITY LED PROJECTS

- *Volunteers publish stories of helping out with monitoring
- *Blog about marine reserves – videos and stories
- Group or forum (like "Friends of") to discuss ideas
    - Need diverse representation
    - Help with project administration
- *Signs at access points either highlighting benefits or "you are here"
- *Boundaries viewer – ability to get frame of reference for where boundary of marine reserve is
    - Telescope or some kind of other physical viewer
- High definition camera on land to show/pan whole area (boundary area viewer)
    - Could show footage on web
- Adopt a part of marine reserve – advertise in schools to reach parents

Information Events:

- *Docent led walks on Saturdays in summer - access beach from Logan Rd. or other access point
    - Tie to Whale Watching Spoken Here, Master Naturalist Program, volunteer naturalists.
    - Camp West wind might be a point of contact
- Information booth at Saturday/farmers market , kite festival, senior fairs
    - Tabling kit with information might be beneficial
- ****Annual celebration –on start of marine reserve date
    - Could have speakers present research and data
- Booth at Dory Days or Blessing of the Fleet?
    - What info would they like if any about the marine reserve?

Information Pathways:

- *"Minimize disturbance" language on outreach products – promote best practices – "leave no trace"
    - Use language in all info for guides, businesses, users
    - Could use blog as delivery device
- Present information at city council meeting and commissioner meetings – updates on info
- Information kiosk

- Outreach packet – charters, ecotours, recreation info
- Speaker bureau gathering of "trained people" to give presentations to community groups
- Desk videos and outreach to hotels and other businesses
    - Show underwater video
    - Other brochures or information
- News media - target people who live in the Willamette Valley
- Create "competitions" between reserve sites to help generate interest and content
    - Biggest fish, best photo

Education:

- What is the use of marine reserves by schools?
- Are they promoted and used as living laboratories?
- Does school use of marine reserves contribute to ocean literacy?
- Example crab life history information
- **Curriculum – identify an educator
- Have a liaison for scientists conducting research and schools
- **Make ecological data available for use in educational materials

OUTREACH & COMPLIANCE - COMMUNITY SUGGESTED PROJECTS

- Exhibit at Oregon Coast Aquarium and HMSC Visitors Center, Sea Grant offices
    - *List/display icon of fish species that also live in the reserve
- Existing research results more widely spread to public/community

ODFW LED:

- Suggested projects that ODFW is currently or planning on conducting:
- Determine demand, economic impact, and value of visitation
- Measure economic impact on charter fleet
- Coordinates out to sport fishermen – on Garmin, Fleer, Ray Marine platforms
- *Is use of the marine reserve area changing over time

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