

# **Oregon Marine Fisheries Management Plan Framework**

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## **Table of Contents**

<u>Acronyms and Abbreviations</u> .....	vi
<u>Definitions</u> .....	vii
Oregon Marine Fisheries Management Plan Framework.....	1
A. Introduction.....	1
B. Goals.....	1
C. Scope.....	3
C.1. Oregon’s Marine Fishes, Invertebrate Species and Associated Habitats.....	3
C.2. Definition of a “Marine Fishery”.....	3
C.3. Definition of a “Fishery Management Plan”.....	3
C.4. Oregon’s Marine Fisheries Management Plans in the Larger Context of Marine Fisheries Management.....	3
C.5. Other Benefits and Uses Taken into Consideration.....	4
D. State of Oregon Marine Fisheries Management.....	4
D.1. State Jurisdiction over Marine Fisheries.....	4
D.2. State Marine Fisheries Management Infrastructure and Roles.....	5
D.2.1. Oregon Fish and Wildlife Commission.....	5
D.2.2. Oregon Department of Fish and Wildlife.....	5
D.2.3. Oregon State Police.....	5
D.2.4. Public Involvement.....	5
a. Oregon Department of Fish and Wildlife Advisory Committees.....	6
b. Department Public Meetings.....	6
c. Commission Meetings.....	6
D.2.5 Partners to State Fisheries Management.....	6
D.3. The Oregon Department of Fish and Wildlife Mission and Guiding Principles.....	6
D.3.1. The Oregon Department of Fish and Wildlife Mission.....	7
D.3.2. Sustainability.....	7
D.3.3. Ecosystem Approaches to Fisheries Management.....	7
D.3.4. Precautionary Approach.....	7
D.3.5. Access to Public Resources.....	7
D.3.6. Proactive Management.....	8
D.4. Major State Policies.....	8
D.4.1. Food Fish Management Policy (1975).....	8

D.4.2. Wildlife Policy (1973) .....	8
D.4.3. Native Fish Conservation Policy (2003) .....	9
D.4.4. Oregon Nearshore Strategy (2005).....	9
D.4.5. Oregon Territorial Sea Plan (1994) .....	10
D.4.6. Statewide Planning Goals .....	10
D.4.7. Incorporation of Future Policies .....	11
E. Structure for State Marine Fisheries Management Plans .....	11
E.1. Resource Analyses .....	11
E.2. Harvest Management Strategies .....	13
F. Marine Fisheries Management Considerations.....	16
F.1. Fishing Activities that Impact Fishery Resources.....	16
F.1.1. Extraction .....	16
F.1.2. Biological Impacts to Targeted Species .....	16
F.1.3. Bycatch .....	16
F.1.3. Habitat Alteration or Loss .....	17
F.2. Other Human Activities that Impact Fishery Resources.....	17
F.3. Ecosystem Factors that Impact Fishery Resources.....	17
F.3.1. Environmental Variation .....	17
F.3.2. Ecological Interactions.....	18
F.3.3. Climate Change and Ocean Acidification .....	18
F.4. Ecosystem Services.....	18
F.5. Research and Education .....	19
F.6. Non-fishing Recreation and Tourism.....	19
F.7. Renewable Energy .....	19
F.8. Mariculture .....	20
G. Development, Adoption and Review of Marine Fisheries Management Plans .....	20
G.1. Evaluate Current Management of Fisheries .....	20
G.2. Resource Analysis Development.....	21
G.3. Harvest Management Strategy Development .....	21
G.4. Adoption of MFMP by Oregon Fish and Wildlife Commission .....	21
G.5. Review and Revision of MFMPs .....	21
Figure 1. ....	22
H. Fishery Analysis and Management Tools.....	23

H.1. Resource Analysis Tools .....	23
H.2. Fishery Management Tools.....	23
I. Implementing Marine Fisheries Management Plans through Adaptive Management.....	23
I.1. Managing the Fishery .....	23
I.1.1. Adaptive Management.....	23
I.2. Review of Marine Fisheries Management Plans .....	24
I.2.1. Periodic Reports on State of the Fishery.....	24
I.2.2. Ten-year Review of each Resource Analysis and Harvest Management Strategy.....	24
J. Summary .....	25
K. Literature Cited.....	26
Appendix A: International and Federal Management Affecting Oregon Fisheries.....	31
1. International Fisheries Management .....	31
1.1. United Nations Fishing Agreement .....	31
1.2. International Pacific Halibut Commission .....	31
1.3. The Inter-American Tropical Tuna Commission .....	31
1.4. Pacific Coast Albacore Tuna Vessels and Port Privileges Treaty .....	32
1.5. Pacific Whiting Treaty .....	32
2. Federal Fisheries Management .....	33
2.1. Federal Legislation Integral to the Development of MFMPs .....	33
a. Presidential Proclamation 5030 (1983).....	33
b. Submerged Lands Act (1953) .....	33
c. Magnuson-Stevens Fishery Conservation and Management Act (1976).....	33
d. Endangered Species Act (1973) .....	34
e. Marine Mammal Protection Act (1972).....	34
f. Migratory Bird Treaty Act (1918).....	34
g. Coastal Zone Management Act (1972).....	35
2.2. Federal Fishery Management Bodies.....	35
a. National Marine Fisheries Service (NMFS also known as NOAA Fisheries) .....	35
b. Pacific Fishery Management Council .....	35
Appendix B: Overview of Analysis and Management Tools .....	37
Table 1. ....	37
Table 2. ....	39



## **Acronyms and Abbreviations**

ACL	Annual Catch Limit
CCLME	California Current Large Marine Ecosystem
CZMA	Coastal Zone Management Act
Commission	Oregon Fish and Wildlife Commission
Council	Pacific Fishery Management Council
CPUE	Catch Per Unit Effort
Department	Oregon Department of Fish and Wildlife
DOC	Department of Commerce
EEZ	Exclusive Economic Zone
ESA	Endangered Species Act
FMP	Fishery Management Plan
IPHC	International Pacific Halibut Commission
IATTC	Inter-American Tropical Tuna Commission
JTC	Joint Technical Committee
MBTA	Migratory Bird Treaty Act
MFMP	Marine Fisheries Management Plan
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NFCP	Native Fish Conservation Policy
NMFS	National Marine Fisheries Service (NOAA Fisheries)
NOAA	National Oceanic and Atmospheric Administration
OAR	Oregon Administrative Rule
ODA	Oregon Department of Agriculture
ODFW	Oregon Department of Fish and Wildlife
ORS	Oregon Revised Statutes
SCUBA	Self-Contained Underwater Breathing Apparatus
TAC	Total Allowable Catch
TSP	(Oregon) Territorial Sea Plan
UNFA	United Nations Fishing Agreement
USFWS	United States Fish and Wildlife Service
WCPF Convention	Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean

## **Definitions**

The following definitions are used in this document. Many are drawn from international, federal, or state treaties, legislation, or rules related to fishery management.

**Bycatch:** discarded catch of any living marine resource plus retained incidental catch and unobserved mortality due to a direct encounter with fishing gear.

**Catch per unit effort (CPUE):** the quantity of catch divided by a clearly defined measure of fishing effort undertaken to obtain the catch. For the purposes of studying fish stocks fishing effort includes both a time component and a fishing power component specifically defined for a gear type utilized in a fishery.

**Coastal baseline:** the low-water line along the coast marked on large-scale charts officially recognized by the coastal state.

**Commercial fishery:** the harvest of food fish in a legal manner where the catch is utilized for commercial purposes.

**Commercial purposes:** taking food fish with any gear unlawful for angling, or taking or possessing food fish in excess of the limits permitted for personal use, or taking, fishing for, handling, processing, or otherwise disposing of or dealing in food fish with the intent of disposing of such food fish or parts thereof for profit, or by sale, barter or trade, in commercial channels.

**Conservation:** managing for sustainability of native fish so present and future generations may enjoy their ecological, economic, recreational, and aesthetic benefits.

**Continental shelf:** the seabed and subsoil of the submarine areas adjacent to the coast, but outside the area of the territorial sea, of the United States, to a depth of 200 meters or, beyond that limit, to where the depth of the superjacent waters admits of the exploitation of the natural resources of such areas.

**Ecosystem:** a functional unit consisting of a collection of plants, animals including humans, micro-organisms and non-living components of the environment, and the interactions between them.

**Ecosystem services:** Benefits people obtain from ecosystems. These fall into four categories that include: Provisioning services such as food and product materials; regulating services that affect climate, floods, disease, wastes and water quality; cultural services that provide recreational, aesthetic and spiritual benefits; and supporting services such as photosynthesis and nutrient cycling.

**Endangered:** a species that is in danger of extinction throughout all or a significant portion of its range.

**Essential fish habitat:** waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity.

**Exclusive Economic Zone (EEZ):** the ocean zone out to 200 nautical miles offshore of a sovereign nation's baseline coast. For the purposes of the Magnuson-Stevens Fisheries Conservation and Management Act, the U.S. EEZ has an inner boundary that is coterminous with the territorial sea of a coastal state. The inner boundary of the U.S. EEZ along the Oregon coast is coterminous with Oregon's territorial sea which extends out to 3 nautical miles from shore.

**Fishery:** all entities and activities involved in the harvest of a living marine resource.

**Fishery management plan (FMP):** comprehensive documents which the Oregon Department of Fish and Wildlife regards both as a means to implement policy and as an explanation of the intent and rationale of management direction. Plans contain factual background material,

statements of the rationale for selection of objectives, strategies to be applied to attain objectives, and statements of general priorities for various actions.

**Fishing:** any activity other than scientific research that involves the catching, taking, or harvesting of any aquatic animal including, but not limited to fish, mollusks, and crustaceans; or any attempt to do so.

**Food fish:** any animal over which the Oregon Fish and Wildlife Commission has jurisdiction pursuant to Oregon Revised Statute 506.036. These include all fish, shellfish, and all other animals living intertidally on the bottom.

**Harvest:** to take, fish for, hunt, pursue, catch, capture, or kill; or attempt to do so.

**High seas:** all waters beyond the EEZ of the United States and beyond any foreign nation's EEZ, to the extent that such EEZ is recognized by the United States.

**Incidental catch:** catch that is not part of the targeted catch. This includes retained non-targeted catch and discarded catch.

**Marine waters:** estuaries, waters of the estuarine zone, including wetlands, any other waters seaward of the historic height of tidal influence, the territorial seas, the contiguous zone, and the ocean.

**Maximum sustainable yield (MSY):** the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions.

**Nautical mile (nm):** a unit of length approximately one minute of arc measured along any meridian. One nm = 1,852 meters  $\approx$  6076 feet = 1.15 miles (statute).

**Optimum level:** population levels that provide self-sustaining species as well as taking, non-consumptive and recreational opportunities.

**Optimum yield (OY):** the amount of fish that will provide the greatest overall benefit to the state, particularly with respect to food production and recreational opportunities, while taking into account the protection of the marine ecosystem. Optimum yield is prescribed on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and, in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery.

**Overfished:** status of a stock or stock complex when its biomass has declined below a level that jeopardizes the capacity of the stock to produce maximum sustained yield on a continuing basis.

**Overfishing:** a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce the maximum sustainable yield on a continuing basis.

**Personal use:** harvesting food fish by angling or by such other means and with such gear as the Oregon Fish and Wildlife Commission may authorize for fishing for personal use, or possessing the same for the use of the person fishing for, taking or possessing the same and not for sale or barter.

**Recreational fishery:** any harvest of living marine species in a legal manner for personal use or enjoyment that does not include any sale, barter, or trade of all or any part of the catch.

**Serious depletion:** significant likelihood the species management unit will become threatened or endangered under either state of federal Endangered Species Acts.

**Species complex:** a group of stocks sufficiently similar in geographic distribution, life history, and vulnerabilities to a fishery such that the impact of management actions on the stocks is similar.

**Stock:** a species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

**Straddling fish stocks:** fish stocks whose distributions cross either multiple EEZs or EEZs and the high seas.

**Sustainable:** using, developing and protecting resources in a manner that enable people to meet current needs and provides that future generations can also meet future needs, from the perspective of environmental, economic and community objectives.

**Sustainable population: a populations that is** persistent over time; that is to say the ability of a population or a species management unit to maintain temporal, spatial, genetic, and ecological coherence while withstanding demographic, environmental, and genetic variation and catastrophic events from natural and human induced causes.

**Threatened:** a species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

**Treaty:** any international agreement which is a treaty within the meaning of Section 2 of Article II of the U.S. Constitution.

# Oregon Marine Fisheries Management Plan Framework

## A. Introduction

The marine environment along the Oregon coast provides many opportunities for commercial and recreational use that bring substantial economic benefits to Oregon. The harvest of living marine resources in fisheries comprises a significant portion of these activities. Oregon manages all the state's marine fishery resources, some in conjunction with international and/or federal management, while other species or species complexes are entirely under state management. The purpose of this Marine Fisheries Management Plan Framework (Framework) is to guide the development of balanced Marine Fisheries Management Plans (MFMPs) intended to optimize commercial fisheries, recreational fisheries, new fisheries, and other harvest of marine resources while maintaining ecosystem integrity.

Marine Fisheries Management Plans should be designed to maintain access to and to sustain harvests of marine fish and shellfish stocks for current and future generations of Oregonians. Marine Fisheries Management Plans developed by Oregon are intended to ensure orderly, optimal and equitable utilization of marine resources by different user groups. Although MFMPs provide for economic considerations, management practices that provide for sustainable fisheries and protection of ecosystem services shall take precedence. Marine fishery management policies formulated in the MFMPs should be founded on and facilitate the implementation of these overlying values.

This Framework is developed under the umbrella of Oregon's Native Fish Conservation Policy (NFCP; see section 4.3) and is intended to provide resource managers with a consistent approach for evaluating the marine component of our resources. Conservation plans are implemented under the NFCP for anadromous salmonid stocks as needed, so MFMPs will not be developed for salmonids. Each MFMP should be tailored to fit the specific resources and the fisheries it addresses. The Framework establishes the goals and the scope of marine fishery resources for which state MFMPs should be developed. It articulates the policies and guidelines applied by the Oregon Department of Fish and Wildlife (Department) in the management of marine fisheries. The Framework recognizes other benefits and uses of these resources. It places MFMPs into the context of existing international, federal and state fisheries management and summarizes the entities, principles, and processes involved.

This Framework also identifies a number of important considerations and challenges that managers should take into account when developing MFMPs. This Framework sets the structure for the components of MFMPs, Resource Analyses and Harvest Management Strategies, which provide the biological, ecological, and socio-economic context for managing marine fisheries and identifies some of the tools useful for analysis and management. Finally, the Framework establishes the process for developing, updating, reviewing, and revising MFMPs.

## B. Goals

Oregon has identified six main goals for MFMPs developed under this Framework. These goals are based on Oregon statutes, rules, and major state policies (see section D). These goals may evolve over time and will be updated as needed. Individual MFMPs developed under this

Framework will evaluate fishery resources and articulate management strategies necessary for achieving these goals in their Resource Analyses and Harvest Management Strategies (see section E).

**Goal 1: *Provide for access to marine resources for present and future generations***

This goal recognizes the mission of the Department: “To protect and enhance Oregon’s fish and wildlife and their habitats for use and enjoyment by present and future generations.” Providing for and maintaining access to state resources is also a goal of Oregon’s Food Fish Management Policy. In order to manage fishery resources sustainably, managers should strive to manage harvest for optimum population levels and maintain ecosystem integrity.

**Goal 2: *Minimize bycatch, incidental catch, and mortality related to fishery interactions with non-target marine organisms***

This goal seeks to minimize bycatch of species that are not targeted by the fishery. It strives to minimize both incidental catch of protected species and mortality to non-target organisms interacting with marine fisheries to the extent practicable.

**Goal 3: *Coordinate the management of commercial and recreational fisheries***

The management of multiple marine fishery sectors utilizing the same resource should be coordinated to share knowledge of the resource, and to avoid or minimize conflicts between uses to the extent possible without favoring one user group over another.

**Goal 4: *Minimize complexity of management***

This goal seeks to minimize the complexity of marine fisheries management to the extent practicable to allow the public to understand enforceable regulations more easily, to provide stability in the harvest levels, and to limit in-season management measures. However, it is recognized there are tradeoffs between management complexity and maintaining fishery access.

**Goal 5: *Consider the socioeconomic needs of local communities, including both consumptive and non-consumptive uses and values***

This goal encompasses both consumptive and non-consumptive uses of marine resources within the community and can include considerations for the commercial and recreational fishing industries, tourism, cultural or aesthetic qualities, and other types of recreation such as boating, surfing, SCUBA diving, and photography. This goal recognizes the socioeconomic importance of all marine resource uses and directs managers to take these uses into consideration.

**Goal 6: *Involve the public in the fisheries management process***

Involving the public in the management process is a priority for the Department. The Department is committed to keeping the public informed about opportunities for participation through media outlets, the Department website, and offering subscriptions to subject-specific e-mail and text alerts. The Department may take steps to widen public involvement in fisheries management if necessary.

## **C. Scope**

The scope of marine resources and associated fisheries encompassed by this Framework and individual MFMPs developed under these guidelines is addressed in this section. Conservation plans are developed for salmonids as needed under the Native Fish Conservation Policy. Fisheries and management plans are defined. While MFMPs focus on managing sustainable harvest for fisheries, they also consider other benefits and uses of marine resources that may not fall directly within the scope of managing fisheries (see section F).

### **C.1. Oregon’s Marine Fishes, Invertebrate Species and Associated Habitats**

Oregon’s marine environment is home to a vast array of fish, invertebrates, marine mammals, reptiles, birds, algae, and plants. This area hosts a diversity of habitats, provides important ecosystem services, and is critical to multiple life stages of many valuable commercial and recreational fishery species. Marine habitats range from open waters to submerged bottoms composed of soft sediments, gravel, cobble, shell, bedrock, or high-relief rocky reefs; from tidepools to broad expanses of intertidal sandy beaches; from salt marshes to estuarine mudflats. All of these components are integral parts of a complex marine ecosystem and are interconnected through food webs, nutrient cycling, habitat usage, ocean currents, and a multitude of other biological, physical, chemical, geological and human use factors. The sustainability of Oregon’s marine fishery resources is directly connected to the interactions of these ecological components and processes (ORS 506.755.1<sup>1</sup>); therefore, all of these interconnections will be considered when developing Oregon’s MFMPs for any given species or species complex.

### **C.2. Definition of a “Marine Fishery”**

For purposes of this document, a “marine fishery” constitutes all entities involved in the harvest of living marine resources. Marine fisheries in Oregon’s MFMPs are defined in terms of one or more of the following: the people and communities involved, the species or species complex targeted, the ecosystem inhabited by harvested species, the geographic area of water or seabed fished, the method of fishing, and/or the purpose of the harvest activity.

### **C.3. Definition of a “Fishery Management Plan”**

A fishery management plan (FMP) is defined as a comprehensive document which the Department regards both as a means to implement policy and as an explanation of the intent and rationale of management direction. Fishery management plans contain factual background material, statements of rationale for selection of objectives, strategies to be applied to attain objectives, and statements of general priorities for various actions (OAR 635-500-0002<sup>2</sup>).

### **C.4. Oregon’s Marine Fisheries Management Plans in the Larger Context of Marine Fisheries Management**

Marine Fishery Management Plans developed by Oregon cover specific species or species complexes, and complement and build upon numerous principles, agreements, policies, and treaties established by organizations managing fisheries at international, federal, regional, and state levels. An overview of those most pertinent to the development of Oregon’s MFMPs is summarized in Appendix A. Oregon manages some marine fisheries in conjunction with international and federal management authorities, but many marine fisheries fall entirely under state management. The state will develop MFMPs under guidelines set forth in this Framework

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<sup>1</sup> Oregon Revised Statutes (ORS) mentioned in the Framework are available at <http://www.leg.state.or.us/ors/>

<sup>2</sup> Oregon Administrative Rules (OARs) mentioned in the Framework are available online at <http://www.dfw.state.or.us/OARs/index.asp>.

to regulate the harvest of marine stocks as Department resources allow. Stock prioritization criteria that consider existing management and available staff resources guide the state MFMP development process (see section G.1). These MFMPs apply to all harvest and collection activities for living marine resources including commercial fisheries (as defined in ORS 506.006.4), recreational fisheries (as defined in ORS 506.006.10), new fisheries that may develop, and other forms of harvest that require special permits (ORS 508.111) such as for research, education, and aquaria. Specific exceptions to the harvest of marine resources with respect to United States' treaties with Indian tribes are detailed in ORS 506.045 and other documents related to specific Indian tribes.

### **C.5. Other Benefits and Uses Taken into Consideration**

The development of Oregon MFMPs should consider other uses of and benefits provided by the state's marine environment while recognizing that the scope of MFMPs is limited to managing the harvest of living marine resources. Taking these benefits and uses into consideration should help minimize or eliminate conflict among user groups. These other benefits and uses of fishery resources are among the many considerations that should be taken into account when developing MFMPs for Oregon (see sections D, E and G).

## **D. State of Oregon Marine Fisheries Management**

Oregon has authority over all marine fish, shellfish and other animals harvested in state waters, or transported into or landed in the state, regardless of the location of harvest (ORS 506.036(2)). Oregon follows federal harvest specifications for species managed under federal FMPs, but may set more conservative harvest measures in state rule for these species if deemed appropriate and necessary. The extent of Oregon's jurisdiction over marine fisheries, the scope of fisheries for which MFMPs may be developed, the fundamental principles guiding MFMP development, existing policies germane to developing MFMPs, and mechanisms for public involvement in the MFMP process are described below.

### **D.1. State Jurisdiction over Marine Fisheries**

Oregon manages all living marine resources within the state's territorial sea extending seaward three nautical miles from the low water baseline of either the coast or from state offshore islands and rocks, as authorized by the Submerged Lands Act (see Appendix A). The adoption of Oregon's Fisheries Conservation Zone (ORS 506.755) expands the state's discretionary jurisdiction over all marine fisheries resources seaward 50 statute miles from the state's mean high water mark. The federal Magnuson-Stevens Fishery Conservation and Management Act (MSA) grants Oregon management authority over the Dungeness crab fishery out 200 nautical miles to the Exclusive Economic Zone (EEZ) boundary (MSA P.L. 109-479, sec. 302, NMFS 2010a). Furthermore, MSA authorizes Oregon to regulate fishing activity of vessels outside state boundaries when such vessels are registered with Oregon and no federal fishery management plan or regulations are in place for the fishery in which vessels are operating (MSA P.L. 104-297, sec. 306, NMFS 2010a). Oregon also has jurisdiction over many fisheries in its estuaries including those for species dependent on marine waters.

The primary state statutes governing Oregon's jurisdiction over living marine resources are the Wildlife Code (ORS Chapters 496 - 501) and the Commercial Fishing Code (ORS Chapters 506 - 513). Statutes are created and passed by the Oregon State Legislature. The Wildlife Code sets laws for managing all the state's wildlife including mammals, birds, fish, amphibians, reptiles

and shellfish. Recreational fisheries are governed by the Wildlife Code. The Commercial Fishing Code provides law and policy for managing commercial fisheries.

## **D.2. State Marine Fisheries Management Infrastructure and Roles**

The infrastructure for marine fisheries management in Oregon includes a number of entities that play separate but interrelated roles. Described here are several of these key organizations and their roles in state marine fisheries management.

### **D.2.1. Oregon Fish and Wildlife Commission**

Oregon Revised Statute 496.090 establishes the Oregon Fish and Wildlife Commission (Commission). The Commission consists of seven members appointed by the Governor for four-year staggered terms. The Commission is charged with protecting fish in Oregon and has jurisdiction over fish, shellfish and all other animals both living within state territorial waters, and transported into or landed within state boundaries even if harvested outside state waters (ORS 506.036). The Commission formulates general state programs and policies concerning management and conservation of fish and wildlife resources. It establishes seasons, methods, harvest caps, bag limits, size limits, and other management measures for recreational and commercial harvest through Oregon Administrative Rules (OARs). The Commission will evaluate and adopt MFMP's along with rules needed for implementation.

### **D.2.2. Oregon Department of Fish and Wildlife**

The Oregon Department of Fish and Wildlife, authorized by ORS 496.080, is the executive branch of state government responsible for managing fish and wildlife resources through policies enacted by the Commission. The Department implements fish and wildlife laws, rules, policies and Commission actions through programs staffed by fishery managers, biologists, technical experts, and others. Primary programs within the Department include the Fish Division, Wildlife Division, and Administrative Services Division. The Marine Resources Program within the Fish Division carries out state management actions for Oregon's marine and estuarine fish and wildlife resources. The Marine Resources Program focuses on:

- Marine resource policy, management, and regulation
- Marine fisheries monitoring and data collection
- Research on marine fisheries, species, and habitats

### **D.2.3. Oregon State Police**

Enforcement of marine fisheries regulations is administered through Oregon State Police's Fish and Wildlife Enforcement Services Division.

### **D.2.4. Public Involvement**

Public involvement in fishery management is important. It helps shape management practices that work from the socioeconomic perspective. Public involvement in the development of MFMPs may be accomplished through multiple established channels. Opportunities to provide public testimony are listed below.

### **a. Oregon Department of Fish and Wildlife Advisory Committees**

The Department has established Fish and Wildlife Advisory Committees comprised of people interested in sustaining Oregon's marine fisheries resources. Advisory committees allow for the general public, resource user groups, non-governmental organizations, Indian tribes, and/or other agencies the opportunity to communicate with and advise the Department on approaches to managing marine fisheries for sustainability.

### **b. Department Public Meetings**

The Department holds public meetings related to fisheries and fishery resources for stakeholders. The meetings are designed to provide information and to obtain public input. All members of the public are welcome at Department public meetings.

### **c. Commission Meetings**

Oregon Fish and Wildlife Commission meetings are open to the public as part of the Oregon form of government. Oregon's policy is that decision making bodies such as the Commission arrive at decisions openly (ORS 192.620). Public notices of Commission meetings are widely distributed, meeting agendas and materials are available prior to meetings, and recorded minutes are published. The Commission values public input and has procedures in place to receive information provided by the public at its meetings. The public may provide both written summaries of information to be considered and oral testimony. Details on Commission meetings and how the public may provide input to the Commission can be found at: <http://www.dfw.state.or.us/agency/commission/>. Adoption of MFMPs will take place at Commission meetings (see section G).

## **D.2.5 Partners to State Fisheries Management**

Several other agencies and commissions play important roles related to fisheries. The Oregon Department of Agriculture (ODA) tests Dungeness crab, coastal clams, and mussels for biotoxins to ensure these resources are safe for human consumption and can close specific areas to harvest when toxins are found in levels of concern. The ODA has jurisdiction over bivalve cultivation (e.g., oysters and mussels) and works closely with the Department on permitting and natural resources issues related to mariculture activities. Commodity commissions that represent fishery industry sectors including albacore tuna, Dungeness crab, salmon, and trawl fisheries have also been set up through ODA. Members of the commodity commissions serve as advisors and collaborators on Department and industry initiatives. The Department of Environmental Quality tests water quality and can close areas to harvest when problems that impact harvested resources are identified. The Pacific States Marine Fisheries Commission serves as a forum for consultation on interstate fisheries issues of mutual concern (e.g., Dungeness crab), fisheries data collection and information management and sharing. Member states include Oregon, California, Washington, Idaho, and Alaska. State fisheries management is undertaken in concert with both federal and international management bodies, which are described in Appendix A.

## **D.3. The Oregon Department of Fish and Wildlife Mission and Guiding Principles**

The development of MFMPs for Oregon's marine fisheries is guided by the mission and principles of the Department including:

### **D.3.1. The Oregon Department of Fish and Wildlife Mission**

The mission statement of the Department is:

*“to protect and enhance Oregon’s fish and wildlife and their habitats for use and enjoyment by present and future generations.”*

This mission is the primary intent of MFMPs developed by Oregon.

### **D.3.2. Sustainability**

Sustainability is defined in Oregon law as, “using, developing and protecting resources in a manner that enables people to meet current needs and provides that future generations can also meet future needs, from the joint perspective of environmental, economic and community objectives” (ORS 184.421(4); Oregon Sustainability Act 2001). Sustainability is a fundamental principle guiding management of Oregon’s marine fisheries and the development of MFMPs.

### **D.3.3. Ecosystem Approaches to Fisheries Management**

Ecological interconnections within Oregon’s territorial sea and adjacent ocean waters are essential for sustainable marine fisheries, and help guarantee the well-being of the economy and the people of the state (ORS 506.750). Oregon’s MFMPs will incorporate Ecosystem Approaches to Fisheries in the management of the state’s living marine resources (FAO 2005). This principle implies that management of individual fish stocks should consider the effects of harvest activities on both other fisheries and on the overall ecosystem to the extent practicable (see section F).

### **D.3.4. Precautionary Approach**

The precautionary management approach favors constraining harvest activities when there is high scientific uncertainty regarding the effects of such activities on the resource and on the natural environment until proof of no significant negative impact is obtained (National Research Council 2001). Oregon should apply the precautionary approach in the absence of sufficient scientific information as specified in the Native Fish Conservation Policy (OAR 635-007-0504; ODFW 2003). The Department should proceed with precautionary strategies for the harvest of marine resources that are scaled to the conservation risk, and proceed with less precautionary strategies only if monitoring, evaluation and responsive management keep biological risks within acceptable limits or the Department implements specific research programs to address management uncertainties.

### **D.3.5. Access to Public Resources**

Oregon’s fish and wildlife are managed and protected by the Department and are held in trust for all Oregonians. Providing continued public access to these resources is an important guiding concept, as outlined in the Food Fish Management Policy (ORS 506.109) and the Native Fish Conservation Policy (ODFW 2003). The concept of “access” includes both harvest, and non-consumptive uses of the resource. However, access may come secondary to significant biological or ecological concerns or to uncertainties regarding the sustainable harvest of the resource.

### **D.3.6. Proactive Management**

When possible, a proactive approach to marine fisheries management should be taken in MFMPs. A proactive approach to fisheries management means identifying and taking action to avert or resolve potential problems and issues with fisheries before they occur, rather than applying management actions after a problem has already arisen.

## **D.4. Major State Policies**

Several current state policies establishing regulations germane to the development of Oregon MFMPs are summarized below.

### **D.4.1. Food Fish Management Policy (1975)**

Food fish are defined as all fish, shellfish and all other animals living intertidally on the bottom over which the Commission has jurisdiction in ORS 506.036. It is Oregon policy that food fish shall be managed to provide the optimum economic, commercial, recreational and aesthetic benefits for present and future generations of the citizens of this state. This policy was codified into state of Oregon law with the creation of the Food Fish Management Policy (ORS 506.109). The goals of food fish management are:

- To maintain all species of food fish at optimum levels in all suitable waters of the state and prevent the extinction of any indigenous species;
- To develop and manage the lands and waters of this state in a manner that will optimize the production, utilization and public enjoyment of food fish;
- To permit an optimum and equitable utilization of available food fish;
- To develop and maintain access to the lands and waters of the state and the food fish resources thereon;
- To regulate food fish populations and the utilization and public enjoyment of food fish in a manner that is compatible with other uses of the lands and waters of the state and provides optimum commercial and public recreational benefits;
- To preserve the economic contribution of the sports and commercial fishing industries in a manner consistent with sound food fish management practices; and
- To develop and implement a program for optimizing the return of Oregon food fish for Oregon's recreational and commercial fisheries.

### **D.4.2. Wildlife Policy (1973)**

It is Oregon policy that wildlife, which is defined to include fish and shellfish, shall be managed to prevent serious depletion of any indigenous species and to provide the optimum recreational and aesthetic benefits for present and future generations of the citizens of the state (ORS 496.012). Nothing in Oregon's wildlife laws is intended to affect the provisions of the state's commercial fishing laws. Oregon adopted the Wildlife Policy to implement the following coequal goals in wildlife management:

- Maintain all species of wildlife at optimum levels;
- Develop and manage the lands and waters of the state in a manner that will enhance the

- production and public enjoyment of wildlife;
- Permit an orderly and equitable utilization of available wildlife;
  - Develop and maintain public access to the lands and waters of the state and the wildlife resources thereon;
  - Regulate wildlife populations and the public enjoyment of wildlife in a manner that is compatible with primary uses of the lands and waters of the state;
  - Provide optimum recreational benefits; and
  - Make decisions that affect wildlife resources of the state for the benefit of the wildlife resources and to make decisions that allow for the best social, economic and recreational utilization of wildlife resources by all user groups.

#### **D.4.3. Native Fish Conservation Policy (2003)**

The Native Fish Conservation Policy (NFCP; OAR 635-007-0502 through 635-007-0509; ODFW 2003) was adopted to ensure the conservation and recovery of the native fish of Oregon. The NFCP is implemented through individual conservation plans adopted by the Commission. The three goals of the NFCP are to:

- Prevent the serious depletion of native fish species by protecting natural ecological communities, conserving genetic resources, and managing consumptive and non-consumptive (i.e., catch and release) fisheries;
- Maintain and restore naturally produced native fish species in order to provide substantial ecological, economic and cultural benefits to the citizens of Oregon; and
- Foster and sustain opportunities for sport, commercial, and tribal Indian fishers consistent with the conservation of naturally produced fish and responsible use of hatcheries.

Conservation plans are based on the concept that locally adapted populations provide the best foundation for maintaining and restoring sustainable, naturally-produced native fish populations. Oregon's MFMPs will incorporate these guiding principles. The NFCP's guidelines for the content of conservation plans will be followed and incorporated into MFMP Resource Analyses and Harvest Management Strategies (see sections E), as applicable. The criteria established in the NFCP (see OAR 635-007-0505) will be evaluated during the MFMP development to determine if the MFMP for the species should be a full conservation plan. Development of MFMPs is designed to promote the goals of the NFCP and fulfill the need for conservation plans when they are warranted.

#### **D.4.4. Oregon Nearshore Strategy (2005)**

The Oregon Nearshore Strategy (Nearshore Strategy, ODFW 2006) was adopted by the Commission as a part of the larger Oregon Conservation Strategy. The Nearshore Strategy provides recommendations for the Department's management of nearshore fish and wildlife. The Nearshore Strategy also identifies opportunities for public and/or private actions and partnerships that can contribute to the sustainable use of Oregon's marine resources. The priorities established in the Nearshore Strategy guide the Department's strategic investment of time and funding for management of marine resources.

Sixteen recommended Department actions are presented in the Nearshore Strategy that address priority marine issues in need of immediate or timely attention, are feasible to implement given appropriate funding, and have received some level of public support. Recommendations related to MFMPs include:

- *Recommendation 5:* Improve and expand the capabilities of research and monitoring programs for nearshore living marine resources to meet the requirements of the Native Fish Conservation Policy and other nearshore resource management programs.
- *Recommendation 6:* Develop stock assessment and/or stock status indicator strategies for priority nearshore groundfish and shellfish species.
- *Recommendation 7:* Map and characterize nearshore rocky reefs, and determine species-habitat associations. Use this information to improve stock assessments and to provide information for management.
- *Recommendation 11:* Review the Nearshore Strategy species list to identify priority species in need of conservation plans under Oregon’s Native Fish Conservation Policy.
- *Recommendation 12:* Review and update the Interim Management Plan for Oregon’s Nearshore Commercial Fishery.
- *Recommendation 13:* Evaluate immediate and long-term management needs for Oregon’s recreational groundfish fishery.
- *Recommendation 15:* Develop conservation and harvest management plans for commercially and recreationally harvested shellfish.

These recommendations will be partially or entirely addressed through the creation of MFMPs.

#### **D.4.5. Oregon Territorial Sea Plan (1994)**

The Oregon Territorial Sea Plan (TSP, Ocean Policy Advisory Council 1994) was created through a multi-year public process by the Ocean Policy Advisory Council and was adopted by the Oregon Coastal Management Program. This plan focuses on the integration of ocean management and sets procedures and standards for decision makers to balance competing uses of the ocean. The decision making standards in the TSP are intended to protect areas that are important to renewable living marine resources.

Part One of the TSP is an ocean management framework that describes the history of ocean planning, defines Oregon’s territorial sea boundaries, and outlines the laws and policies affecting ocean management. Part Two describes a process for making resource use decisions, and Part Three introduces a rocky shores management strategy. Part Four was adopted in 2000 and deals with underwater utilities. Part Five of the TSP, approved in 2013, describes the process for making decisions regarding renewable energy development.

#### **D.4.6. Statewide Planning Goals**

Oregon’s statewide planning goals and guidelines (OAR 660-015) include guidance on land use as it relates to natural resources. Two goals specifically relate to management of marine fishery resources. Goals 16 and 19 (OAR 660-015-0010) address estuarine and ocean resources, respectively. These goals provide guidance that management of these resources

should ensure long-term ecological, economic, and social values and benefits of these resources to future generations. Living resources and ecosystem integrity are given the highest priority in these goals. More information on statewide planning goals can be found at <http://www.oregon.gov/LCD/Pages/goals.aspx>.

#### **D.4.7. Incorporation of Future Policies**

Future state of Oregon and Department policies, applicable to marine fisheries resource management, should be incorporated into future versions of MFMPs. The adoption of new policies may trigger review and, where necessary, require updates to the Framework, Resource Analyses, and Harvest Management Strategies (see section G).

### **E. Structure for State Marine Fisheries Management Plans**

Oregon MFMPs developed for any given species or species complex will be guided in structure by this Framework. As such the Framework is a common component of all MFMPs. Additional components of individual MFMPs, for single species or species complexes, includes both a Resource Analysis and a Harvest Management Strategy. The Resource Analysis and Harvest Management Strategy should strive to include the information outlined below. By design the components of the Resource Analysis and Harvest Management Strategy are aligned with the elements addressed by the NFCP's Conservation Plans, where applicable. Planning and implementation shall proceed incrementally, consistent with available funding, according to priorities established by the Department with collaboration and input from stakeholders (see section G). The Resource Analysis and the Harvest Management Strategy are formal documents that will be adopted by the Commission.

#### **E.1. Resource Analyses**

The Resource Analysis summarizes information about the species or species complex. Resource Analyses are created to guide Harvest Management Strategies for individual fisheries.

Resource Analyses should include current and historical biological and ecological information on the specific resource, including any stock assessments, alternative stock trend assessments, or population indices. In addition to harvest impacts, natural and anthropogenic factors that may affect the resource should be considered (see section F). Data and information gaps important to consider when Harvest Management Strategies are developed should also be identified. It is recognized that the information available to develop the Resource Analysis will vary, as will the time and staff resources need to develop it. The Resource Analysis is intended to provide a comprehensive status report on the resource given the information and staff resources available. Basic information that Resource Analyses should strive to include if available are:

- I. A description of the species or species complex.
- II. The best available biological and ecological information on the species or species complex including:
  - A. Range, distribution, and stock structure
  - B. Life history characteristics such as age, growth, maturity, fecundity and natural mortality
  - C. Movement and/or migratory patterns

- D. Biotic and abiotic habitat information such as associated substrates, temperatures, salinity, pH, etc.
  - E. Biological relationships including prey, predators, competitors and symbionts
  - F. Variability in recruitment and the main causes if known
  - G. Climate and/or oceanographic interactions known to affect reproduction, recruitment, growth, and natural mortality
- III. Catalog and description of available fishery-independent and fishery-dependent data such as:
- A. Fishery independent survey data
  - B. Catch or landings data including incidental catch in all fisheries
  - C. Age, length, weight data
  - D. Logbook data
  - E. Discard data
- IV. Analysis of stock status and trends or indicators such as:
- A. Stock assessments
    - i) Data-rich integrated stock assessment (e.g., Appendix B Table 1 complexity levels 3 and 4)
    - ii) Data-limited stock assessment (e.g., Appendix B Table 1 complexity levels 2 and 3)
  - B. Analyses of fishery data
    - i) Information on size and/or age trends over time
    - ii) Information on catch per unit effort (CPUE) over time
    - iii) Information on catch trends over time if CPUE information is not available
  - C. Synthesis/analysis of available fishery-independent survey data
  - D. Biological Reference Points for potential use in management
    - i) Target reference points
    - ii) Limit reference points
    - iii) Precautionary reference points
- V. Identification of known threats to the resource
- A. Non-fishery sources of mortality
  - B. Threats to habitat
    - i) Fishery related
    - ii) Non-fishery
- VI. Recommendations on sustainable harvest levels given the available information
- A. Appropriate biological reference points for management
  - B. Other types of limits that ensure sustainable harvest levels (e.g., size, sex, season)
  - C. Identification of known factors that may change the sustainable harvest levels (see section F)
- VII. Identification of information gaps and research needs, including prioritized lists for future research and data collection

## VIII. Literature cited section that documents sources of information utilized

The Resource Analysis should examine available data for the species or species complex, provide the rationale for the tools chosen to analyze stock status, and identify prioritized informational needs for improving the quality of future analyses. The Resource Analysis should also discuss assumptions made in conducting the analysis, any models used, and how results would differ if underlying assumptions are not met.

The level of information available for any given species or species complex will vary. Consequently, the specificity of information in the Resource Analysis for each stock will vary. For example, a species with a well-known distribution, life history, ecological information, and extensive fishery data with a current full age-structured stock assessment under the federal management system may have very specific biological reference points mandated by MSA. Other species may not require any MSA mandated biological reference points because the species are not under federal management. Some species may have very little information available other than limited life history information.

A variety of biological reference points, including target, limit, and precautionary reference points are utilized for fisheries management (e.g., Caddy and Mahon 1995). For many fisheries, the availability of information and technical capacity will limit or preclude the use of data intensive, complex models to set allowable harvest levels and reference points. Developing methods for examining stock status trends or indicators for what have been termed “data-poor” or “data-limited” fisheries is an active area of research. A wide variety of tools are currently available for use (see Appendix B Table 1) and a suite of modeling software is also available (e.g., see <http://nft.nefsc.noaa.gov/>). The requirements for these tools and models range from data-poor to data-rich. The choice of tools utilized will depend, in part on the information and data available. For species that have limited information it may be necessary to utilize several empirical measures to develop a simple “traffic light” system that indicates where current or proposed harvest levels stand (e.g., Caddy 1998). A productivity and susceptibility analysis (Patrick et al. 2010) is a useful option for evaluating risk assessments and for developing relative harvest levels for some species, especially for those with relatively little information available. The recommended reference points or harvest limitations may differ depending on the Harvest Management Strategy that is implemented.

### **E.2. Harvest Management Strategies**

Harvest Management Strategies articulate general management practices (see Appendix B Table 2) for each marine fishery and are developed utilizing both the relevant Resource Analysis and public input.

The Harvest Management Strategy articulates the goals for the fishery both in terms of the resource and the people utilizing it. It examines the fishery in terms of the issues and practices involved with its management. Each Harvest Management Strategy should address the following:

- I. The species or species complex included

- II. Management goals for the resource and fishery including:
  - A. Biological/ecological goals
  - B. Socio-economic goals
  - C. Goals related to interactions with federal and adjacent state fishery management
  - D. Metrics used to measure goal achievement
  - E. Monitoring strategies designed collect data needed to track those metrics
  
- III. Current issues related to the resource such as:
  - A. Concerns over stock status or harvest
  - B. Differing concerns among stakeholders
  - C. Known or suspected fishery related habitat impacts
  
- IV. Description and analysis of fisheries and sectors harvesting those species
  - A. Description of gear types utilized
  - B. Harvest history including economic, social, cultural, and spatial components
  - C. Current and historical management practices including:
    - i) Specific tools (such as those listed in Appendix B Table 2) used to manage the fishery
    - ii) Rationale for use of the management tools selected
    - iii) Analysis of fishery practices resulting from management actions
    - iv) Programs used to monitor, track, and/or sample harvest
  - D. Evaluation of any known interactions among sectors
  - E. Known interactions species listed as threatened or endangered by Oregon or the US, marine mammals, and/or migratory birds
  - F. Known incidental catch and bycatch information
  - G. Examination of any emerging technologies that may affect harvest in the foreseeable future
  - H. Threats to fishery from anthropogenic sources
  
- V. Description of other social and/or cultural uses of the resource
  - A. Wildlife viewing (e.g. SCUBA photography)
  - B. Educational uses (e.g. tidepooling)
  - C. Traditional cultural uses (e.g. tribal ceremonies)
  
- VI. Description of Biological Reference Points utilized for management
  - A. Rationale for any biological reference points chosen for use
  - B. Harvest control rules
  - C. Triggers and management actions
  
- VII. Evaluation of feasible and appropriate management tools (see Appendix B Table 2) to apply to the fisheries and sectors to achieve the management goals
  - A. Examination and analysis of historical management successes and/or failures for the fishery or similar fisheries in other areas
  - B. Policy choices specific to the fishery that influence management
  - C. Recommended actions and management tools that could be applied to the fishery to achieve management goals

- VIII. Recommended actions to help resolve specific issues related to the fishery such as:
- A. Allocations among fishery sectors
  - B. Incidental catch and/or bycatch
  - C. Threats to habitat from fishery
  - D. Interactions with ESA listed species, marine mammals and/or migratory birds

The degree to which individual components of the Harvest Management Strategy need to be or can be addressed will vary depending on the fishery. The outline of Harvest Management Strategy components above specifically includes elements to address the major state policies discussed earlier and the management considerations discussed below (see section F) while allowing flexibility to address the specific challenges likely to be faced by any given fishery. For example, fisheries that are more susceptible to the effects of other human factors such as water quality issues or to environmental factors such as natural variability can specify how those challenges can best be addressed.

Some marine fisheries may already have extensive management in place at the federal level that effectively addresses Harvest Management Strategy components, while other fisheries may have far less information available to draw from. There is a growing body of literature that can assist with how to approach developing a Harvest Management Strategy, especially for data-poor fisheries (e.g., Honey et al. 2010). Use of decision trees or management strategy evaluations should be considered.

Defining the metrics used to evaluate the specific management goals for the fishery is an important step. Often these metrics will be developed from fishery-dependent data that the Department can collect. A substantial portion of the Department's efforts is devoted to programs that monitor both commercial and recreational fisheries along the Oregon coast. Fishing effort, species harvested, amounts harvested, areas of catch, biological information, bycatch information and prices for commercial fisheries catch are all important components of the information collected. Port biologists and seasonal technicians monitor the catch of commercial fishers and recreational anglers and gather biological information including length, weight, sex, stage of maturity, and age samples from the catch. Federal and/or state regulations require logbooks from commercial fishers for most fisheries, purchase records from commercial fish buyers, and access to catch for purposes of collecting biological data and samples. This information can be used in-season, as a basis for tracking fish landings for catch quotas, and to ensure regulatory control of Oregon's fisheries. On a long-term basis, data collected provide state and federal managers with information needed for assessing stocks and developing management measures intended to meet management goals. Much of these data become part of a west coast data system to inform Oregon, Washington, and California regional fisheries management. In this capacity, the public plays a highly significant role in the collection of fishery-dependent data used to manage Oregon's marine fisheries. Harvest Management Strategies should detail what data will be used as metrics for the fishery and how those metrics will be used to evaluate if management goals are being met and what measures can be taken if the targets are not being met.

Evaluating management of a fishery will be an ongoing process. Periodic reports will provide updated information on the state of the fishery to assist these ongoing evaluations (see section I).

## **F. Marine Fisheries Management Considerations**

The harvest of marine resources can have direct and indirect impacts on Oregon's marine ecosystem and human communities that create challenges for resource managers. Direct impacts to marine resources or to habitats associated with fisheries can include effects on abundance, size structure, age structure, genetic composition of stocks, and damage to bottom habitats. Indirect effects can include altering the abundance of a predator, prey or competitor, or activities that interrupt important life history stages of organisms in the ecosystem (FAO 2005). Additional considerations to managing fisheries may be posed by both non-fishing human activities and ecosystem factors that can affect fishery resources. These factors should be considered and addressed during the development of MFMPs to the extent practicable.

### **F.1. Fishing Activities that Impact Fishery Resources**

Managing marine fishery resources poses many challenges. Some are related directly to the effects of fishing, but others include non-fishery effects on fishery resources. Fishing activities that directly impact the marine ecosystem are recognized through both qualitative and quantitative patterns based on data collected for fisheries management. Resource managers look for ways to minimize or to prevent negative impacts to the ecosystem created by fishing activities through proactive, reactive and adaptive use of management tools. The implementation of management tools often involves the modification of the fishing activity. This can include using management tools such as closing areas or seasons to certain fishing activities, modification of gear, or gear restrictions, among others.

#### **F.1.1. Extraction**

The simplest impact of any fishing activity is the extraction of biomass from the ecosystem and the fish population. Excessive harvest of species can result in declines of populations, and can have effects that cascade through the marine ecosystem, affecting habitats and other species. Such impacts can affect the ecosystem services provided to human communities.

#### **F.1.2. Biological Impacts to Targeted Species**

Fishing can affect targeted species by reducing their abundance, spawning potential, and by altering population parameters, such as growth and maturation (Olsen et al. 2004). Fishing can modify age and size structure (Berkeley et al. 2004), sex ratios (Coleman et al. 1996), and species composition of the target resources and other associated non-target species (Pope et al. 2000).

#### **F.1.3. Bycatch**

Bycatch is currently a major factor affecting fisheries management. The policy of the U.S. Congress in the MSA "encourages development of practical measures that minimize bycatch and avoid unnecessary waste of fish". Bycatch may occur because the fishing method used may not be selective enough to catch only marketable size target species or because other species are commonly associated with targeted species in the same habitat. Bycatch is often discarded at sea for regulatory or economic reasons, and may be injured, dying, or dead. Bycatch can negatively impact the sustainability of fisheries and the use of other marine resources. Opportunities to harvest species with healthy populations can be restricted by regulations put in place to reduce bycatch.

### **F.1.3. Habitat Alteration or Loss**

Harvest of marine resources can result in loss or alteration of marine habitats. Excessive harvest of key predators or habitat-forming organisms can lead to alterations in habitat, shifts in the composition of associated biological communities, and collapse of ecosystems (Jackson et al. 2001). Certain gears and fishing methods may come in direct contact with bottom habitat, resulting in loss, damage, or alteration of physical or biogenic structure (Freese et al. 1999). Fishing gear abandoned or lost, and left unattended in the marine environment can also result in the loss or alteration of marine habitats (U.S. State Department 2014). Loss or alteration of habitats necessary for growth and continued reproduction of marine resources can cause significant reductions in the level of sustainable fishery harvest.

Managing fishery activities is the focus of MFMPs. Identifying fishery impacts that are significant and potentially adverse should be a primary consideration when developing a MFMP. Once identified the MFMP should provide practicable management measures designed to avoid and mitigate those impacts.

## **F.2. Other Human Activities that Impact Fishery Resources and Fisheries**

Many human activities may impact the marine ecosystem, and specifically fishery resources and fisheries (Andrews et al. 2012). Dredging, disposal of dredge materials, installation/maintenance/removal of underwater cables and pipelines, and siting of renewable energy platforms or mariculture facilities are some examples of activities that may affect fishery resources or fisheries. Coastal development, storm runoff, industrial pollution, and agricultural practices can affect the habitat, reproduction and survival of fishery resources. Regulation of these activities falls outside the scope of MFMPs. The Department works with other agencies, both state and federal, to examine and understand the effects of activities that can affect both fishery resources and fisheries. The Department may review and advise these agencies on proposed regulations, permits or activities that affect fisheries. Spills of oil, toxic chemicals, or sewage can disrupt fisheries and pose additional challenges for fishery management. Fishery management needs to adapt to these types of emerging situations. Marine Fisheries Management Plans should examine known issues for human factors as they relate to fisheries and identify agency partners that the Department works with on these issues.

## **F.3. Ecosystem Factors that Impact Fishery Resources**

Natural occurrences or changes in a marine ecosystem can impact fishery resources. For example, natural shifts in ocean conditions can result in changes to productivity, to abundance of certain species, or to the composition of species in an area. Ecosystem factors can have negative or positive effects on any given fishery resource. Changes in the status of fishery resources due to naturally occurring events or changes in an ecosystem may warrant modifications of harvest levels or to certain fishing practices. Ecosystem factors resulting in impacts to fishery resources are often hard to predict, but some linkages are known and may be factored into MFMPs.

### **F.3.1. Environmental Variation**

Oregon's marine environment is part of a dynamic marine ecosystem called the California Current Large Marine Ecosystem (CCLME) that varies on seasonal, annual, and decadal time

scales (McKinnell and Dagg 2010). This ecosystem is characterized by seasonal coastal upwelling events that can vary in timing, intensity, and duration which can have dramatic effects on marine resources (Barth et al. 2007). Influences from equatorial waters, such as El Niño events, also contribute to the interannual variability in ocean temperatures, wind patterns, and atmospheric conditions in the Northeast Pacific (Schwing et al. 2002). Decadal scale patterns in North Pacific sea level pressure, sea surface temperatures, air temperatures, and precipitation, termed the Pacific Decadal Oscillation, have been observed to be punctuated by abrupt climate regime shifts that appear to impact a variety of components of the marine ecosystem including fishery resources (Mantua and Hare 2002). Variable freshwater inputs from local sources also alter Oregon's nearshore marine environment. All of these climate factors can contribute to variation in Oregon's fish stocks and fisheries (Lehodey et al. 2006).

### **F.3.2. Ecological Interactions**

The dynamic ecological interactions among various elements of Oregon's marine ecosystem are not well understood but can potentially affect fishery resources. For example, the rapid expansion of the Humboldt squid into the northern California Current caused concern among fishery managers, as these squid have been shown to prey on adult groundfish and multiple types of forage fishes including commercially important species (Field et al. 2007). Both predator-prey interactions and ocean conditions may play a role in the range expansion of these squid (Litz et al. 2011). Kelp forests, which support numerous finfish and invertebrate fisheries, are vulnerable to significant shifts in both grazer and predator abundances (Tegner and Dayton 2000). The introduction of invasive marine species can change community composition, degrade ecosystem function, and induce substantial economic damage (Stachowicz et al. 1999). Disruptions to ecological interactions such as these can cause cascading effects throughout marine ecosystems that impact fisheries (Jackson et al. 2001).

### **F.3.3. Climate Change and Ocean Acidification**

Climate change and ocean acidification may significantly affect Oregon's marine environment and fishery resources (Hixon et al. 2010, ODFW 2012). As global climate change alters wind, precipitation, and temperature patterns, the world's oceans are changing in response (Environmental Protection Agency 2010). Climate change and ocean acidification are already affecting Oregon's marine environment. The ocean off the west coast of North America is becoming more acidic from the uptake of atmospheric carbon dioxide (Feely et al. 2008). There have been increases in the severity and the frequency of hypoxic (low-oxygen) and anoxic (zero-oxygen) events in Oregon waters (Chan et al. 2008), and there is evidence that climate change is a contributing factor (PISCO 2009; Keeling et al. 2010). There is also evidence that ocean currents and seasonal upwelling that make the Oregon coast so productive are changing (Barth et al. 2007). Northward expansions of fish spawning areas have already been observed (Phillips et al. 2007) and additional effects on fishery resources are anticipated.

## **F.4. Ecosystem Services**

Ecosystem services are the benefits people obtain from ecosystems (Millennium Ecosystem Assessment 2005). Oregon's marine environment is an important ecosystem that provides many types of services. Primarily, MFMPs focus on sustaining provisioning services, such as food and product materials, that marine resources provide in the form of commercial and recreational fisheries. In addition to provisioning services, other services the marine ecosystem provides

include supporting services, regulating services, and cultural services. Supporting services are those ecosystem processes prerequisite to all other ecosystem services. Examples of supporting services provided by Oregon's marine ecosystem include nutrient cycling, photosynthesis, primary production, and fish nursery areas. Regulating services are benefits for people resulting from natural ecosystem processes. Examples include maintaining healthy air quality, weather, climate, water quality and quantity, erosion, waste decomposition, disease, and natural hazard regulation. Cultural services are ecosystem services that provide immaterial benefits for people. Cultural services provided by Oregon's marine ecosystem include cultural diversity and heritage values, knowledge systems, educational values, spiritual and religious benefits, aesthetic values, and inspiration. All of these services are vital. The continued integrity of the marine ecosystem contributes to sustainable marine fisheries and coastal communities.

#### **F.5. Research and Education**

Research and education about marine resources is critical for a well-informed public and well-informed decision making processes. Marine resources are often collected for scientific research and educational purposes. Since the late 1980's, the Department has required a special permit for research and education harvests. Individual permits are issued through the Fish Division and the Wildlife Division of the Department, separately. Research results are often incorporated into management decisions. Continuing with and expanding on current research programs, both by Department staff and other researchers, is essential for successful fisheries management. Collection of marine resources for educational purposes is typically very limited. Harvest Management Strategies should factor in both research and educational collection activities. Although there is no direct harvest, the marine environment is also commonly utilized as an outdoor classroom. Some areas may be extensively utilized for this purpose while other areas may not. Harvest Management Strategies should take these needs and uses into consideration.

#### **F.6. Non-fishing Recreation and Tourism**

Both coastal residents and visitors enjoy the marine environment. Oregon's waters provide sightseeing, whale watching, tidepooling, and birding opportunities. Reefs have extensive kelp beds and outcrops. The marine environment is also enjoyed by joggers, beach walkers, kite boarders, surfers, wind surfers, sea kayakers, sailors and other boaters. Common activities that take place in Oregon's marine waters include SCUBA diving and underwater photography. Tourism is a significant source of local income for coastal communities. The Oregon Parks and Recreation Department has documented a general increase in visitation to rocky shore areas at state parks (Hillmann 2006). All of these activities bring people to the coast and contribute to its aesthetic appeal and economy.

#### **F.7. Renewable Energy**

The marine waters off Oregon have been identified as an ideal location for the development of renewable energy facilities on the west coast. As a result, companies have expressed interest in developing facilities off the Oregon coast. Developing renewable energy facilities in the ocean may affect living marine resources and fisheries. Oregon amended its Territorial Sea Plan in 2013 (Oregon Coastal Management Program 2013) with the addition of Part Five: Use of the Territorial Sea for the Development of Renewable Energy Facilities or Other Related Structures, Equipment or Facilities. Part Five outlines the state's policies, required inventory and effects

evaluation, and process for permit application review that will be implemented for proposed developments of renewable energy facilities in Oregon's territorial sea.

There are both state and federal permitting processes for energy facility development in ocean waters off Oregon. Although the processes may differ if the facility is located in state or federal waters, the Department is a significant participant in these processes by providing scientific input and reviewing permit applications. The Department focuses on providing permitting agencies with information on potential effects of proposed projects on living marine resources and fisheries and suggesting appropriate measures that can be taken to monitor and mitigate those effects as needed.

### **F.8. Mariculture**

Mariculture is the farming of marine aquatic organisms, such as fish, mollusks or crustaceans (FAO 2010). In Oregon, the mariculture industry is currently limited to Pacific oyster production in several estuaries, such as Coos, Yaquina, Netarts, and Tillamook bays (Oberrecht 2009). Methods for growing oysters vary with local conditions, but can include bottom and longline culture as well as cultivation from floating rafts and buoys. The oyster, clam, and mussel mariculture industry is regulated by ODA and in some cases counties or Port districts. The Department works with ODA to review submitted applications for potential ecological effects including those on fisheries. The culture of fish and invertebrates other than oysters, clams and mussels in Oregon is under the jurisdiction of the Department (ORS 497.252). In addition to the Department's permitting authority, other state agencies and regional governing bodies (i.e., counties, Port districts) may have permitting or leasing jurisdiction for a particular mariculture facility or activity. Federal agencies have jurisdiction over mariculture in federal waters. The Department would work with these agencies to review any proposed mariculture permit and its potential effects on fish and wildlife resources and fisheries.

### **G. Development, Adoption and Review of Marine Fisheries Management Plans**

One of the main objectives of this Framework is to formalize the processes involved in developing, adopting and reviewing Oregon MFMPs. Detailed below are the processes and guidelines for developing, adopting, reviewing, and revising Resources Analyses and Harvest Management Strategies for individual species and species complexes.

#### **G.1. Evaluate Current Management of Fisheries**

Prior to proceeding with a Resources Analysis, Department managers should evaluate the implementation and effectiveness of existing harvest management of any given species or species complex to determine if a MFMP is needed. Evaluations assist in prioritizing fisheries on which to focus limited staff resources. Characteristics of high priority candidate fisheries and species/species complexes may include:

- Active fishery harvest
- No current stock assessment
- Differing priorities among stakeholders
- Biological or ecological concerns regarding harvest
- Limited or no federal management

- Fishery interactions with ESA listed species, marine mammals, and/or migratory birds

## **G.2. Resource Analysis Development**

The development of each Resource Analysis entails a systematic assessment of the candidate resource based on the processes outlined below:

- Formation of a focus group of Department staff and additional experts, as appropriate
- Focus group develops the Resource Analysis
- Internal Department review
- Technical expert, industry, and public review
- Revisions to the Resource Analysis

## **G.3. Harvest Management Strategy Development**

Following the development of a Resource Analysis for a species or species complex, a Harvest Management Strategy for the marine resource is developed through the processes outlined below.

- Formation of a focus group of Department staff, additional experts and representative stakeholders
- Focus group develops a draft of the Harvest Management Strategy
- Internal review of the Harvest Management Strategy by Department staff
- Public meetings to present the Resource Analysis and the Harvest Management Strategy, and to take public comments
- Revisions to the Harvest Management Strategy and Resource Analysis as needed

## **G.4. Adoption of MFMP by Oregon Fish and Wildlife Commission**

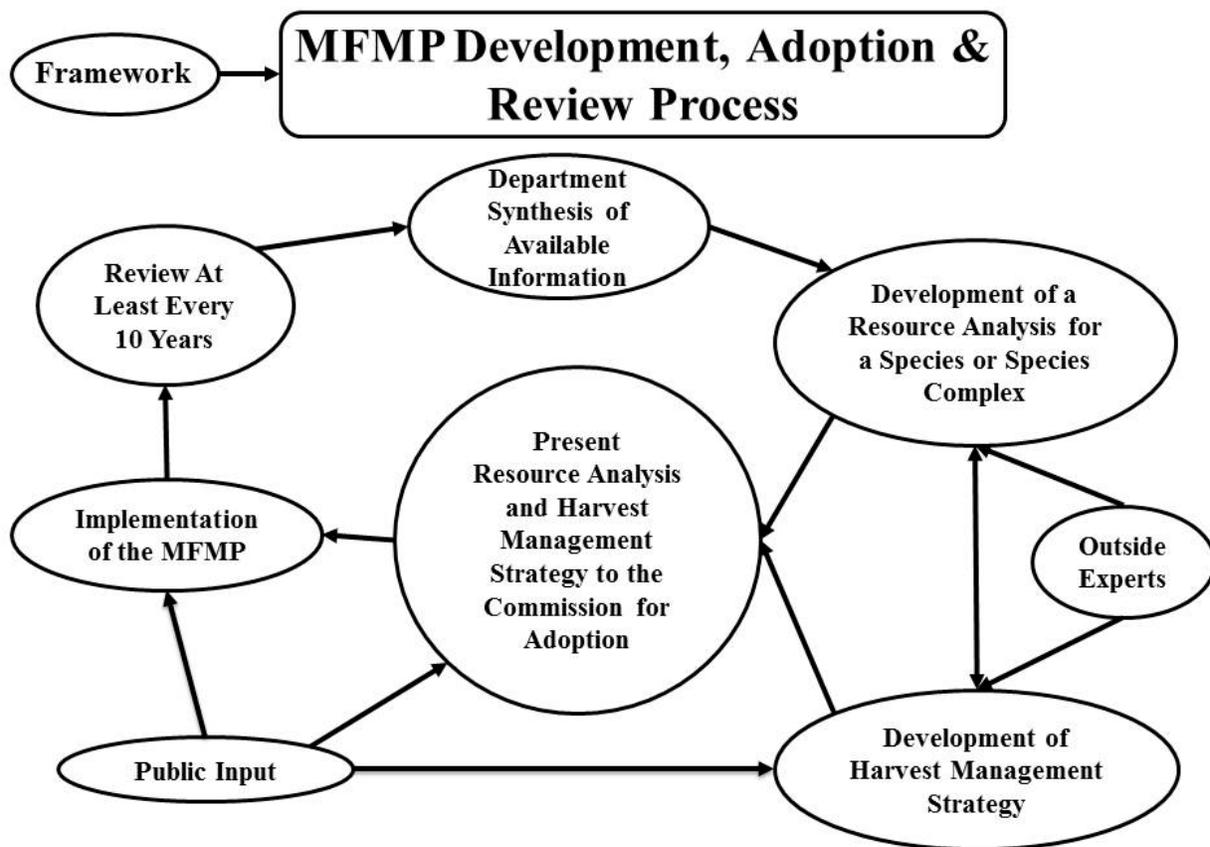
Following the development of a Harvest Management Strategy the MFMP for the fishery is adopted and implemented.

- Present the MFMP, composed of the Harvest Management Strategy and associated Resource Analysis, to the Commission for adoption
- Implementation of the MFMP through use of management tools (Table 2) and rule making (see sections H and I)
- Public input is part of the Commission process and continued public input is taken by the Department and the Commission once the MFMP is implemented

## **G.5. Review and Revision of MFMPs**

The Framework will be reviewed at least every ten years to evaluate if it is adequately serving its purpose or is in need of revision. Simple updates such as updating references to keep them current may not trigger a full review, nor necessitate revisions to individual MFMPs that have been adopted. However if the Framework undergoes revisions needed to fulfill its purpose, then plans previously adopted will also likely need to be reviewed and revised accordingly.

Individual Resource Analyses and Harvest Management Strategies developed and adopted under the Framework will be reviewed within ten years of their adoption to examine new information available about the resource and the fishery, and to determine if revisions are needed. Periodic reports on the fishery produced once a MFMP is implemented will assess if the management goals are being met and provide guidance on the need for comprehensive review at more frequent intervals(see section I.2.1). Updates to individual Harvest Management Strategies may be made without triggering a revision to the entire species' or species complex's MFMP. Harvest Management Strategy reviews are required if there are major changes in the fishery or management of the fishery. Major changes that would trigger a review should be defined in the Harvest Management Strategy and could include such things as technological advances that increase fishing power and harvest rates, shifts in market demand, and persistent trends in management measures designed to modify landings or bycatch. A substantial change in an updated Resource Analysis that results in revised recommendations on sustainable harvest levels triggers a review process, and if necessary a revision of the corresponding Harvest Management Strategy. Figure 1 provides an overview of the process.



**Figure 1.** A schematic diagram depicting the processes involved in the development, adoption and review of individual Marine Fishery Management Plans.

## **H. Fishery Analysis and Management Tools**

A variety of tools are available to the Department for assessing marine fishery resources implementing MFMPs. Some of the most common tools and practices utilized to assess fishery resources and to manage fisheries are described below and specific tools are described in Appendix B (Tables 1 and 2). All of these tools are not currently applied in Oregon fisheries management, however, nothing precludes the Department from using such tools in future management, where existing policies allow. As described above, Resource Analyses and Harvest Management Strategies evaluate and recommend which tools should be applied to specific fisheries.

### **H.1. Resource Analysis Tools**

Some examples of modeling tools utilized for assessing stock status and the effects of fishing activity on stocks of living marine resources that may be useful for resource analyses are presented in Appendix B Table 1. The table includes the types of data inputs required, a brief description, references that provide more detailed descriptions and a relative complexity rating. There is extensive ongoing work to develop fishery resource analysis tools. Fishery analysts and managers developing MFMPs are encouraged to investigate new modeling tools and use those deemed most appropriate.

### **H.2. Fishery Management Tools**

An overview of fishery management tools that could be used to implement MFMPs is provided in Appendix B Table 2. The table is organized by types of controls or tools and provides an outline of the typical purpose of their intended use.

## **I. Implementing Marine Fisheries Management Plans through Adaptive Management**

State of Oregon MFMPs are implemented by the Department once adopted by the Commission. The effective implementation of individual MFMPs should be accomplished by applying a broad range of fisheries management tools, and through regular reviews of both the state of the fishery and of individual Harvest Management Strategies. This section details the tools available to the Department for implementing MFMPs, and establishes a process for reviewing individual fisheries and amending individual Harvest Management Strategies.

### **I.1. Managing the Fishery**

The MFMP is implemented by using selected fishery management tools such as those outlined (Appendix B Table 2). Rules may need to be made through the Commission process. The fishery should be monitored to see that the management metrics specified in the MFMP are being met. The rules may need to be adapted to meet the specific management goals set forth in the MFMP if necessary.

#### **I.1.1. Adaptive Management**

There are many ways to implement adaptive management. Some of the more frequently used methods include:

- In-season actions that involve public notice and temporary rule making
- Regular rule making through the Commission process
- Full review and subsequent regulatory changes

## **I.2. Review of Marine Fisheries Management Plans**

Regular reviews of MFMPs should occur to determine how prescribed management strategies are affecting both the resource and the fishery. The review process is composed of two components: 1) periodic reports on the state of individual fisheries, and 2) ten-year reviews of the Resource Analyses and Harvest Management Strategies for individual fisheries. Information obtained from the review process will be used to update and amend individual Resource Analyses and Harvest Management Strategies to shape MFMPs through the adaptive management process.

### **I.2.1. Periodic Reports on State of the Fishery**

Periodic reports on the state of individual fisheries summarize information and data pertinent to the harvest of the resource and management of the fishery over one- or two-year increments. These reports should detail individual fishery harvest specifications, available information on the number of resource users, effort, landings, bycatch, samples examined, and public input received over specified time intervals. These reports provide information at the appropriate level for state fishery management. They may draw from similar information presented in Status Assessment and Fishery Evaluation documents prepared for federally managed fisheries that may offer a broader perspective. Periodic reports may provide updates to information contained in the Resource Analysis. Information in these documents provides data on resource use essential to both ongoing and ten-year reviews of individual Resource Analyses and Harvest Management Strategies. These reports are completed by Department staff and should evaluate if the goals of the management strategy are being met or if adjustments need to be made. Fishery reports should be posted on the Department website when completed.

### **I.2.2. Ten-year Review of each Resource Analysis and Harvest Management Strategy**

Every ten years, or sooner if needed, a comprehensive review of the Resource Analysis and Harvest Management Strategy of each MFMP should be conducted by the Department. These reviews will examine all information material to the harvest of the resource including, but not limited to:

- Current Harvest Management Strategies
- Harvest specification history
- Harvest data
- Effort data
- Economic data
- New or updated biological and/or ecological information about the species or species complex
- New or updated stock assessments
- New or updated analyses of stock trends or indicators
- New technological developments affecting the fishery
- New developments in the socioeconomic factors affecting the fishery
- New or updated information on threats to the resource
- Problems with current strategies or implementation
- Allocation strategies
- New understanding of environmental indicators

If information gathered during the ten-year review indicates a need to alter existing management strategies for a fishery, such information will trigger the Department to conduct an updated Resource Analysis and Harvest Management Strategy to amend the MFMP.

### **J. Summary**

In summary, this Framework for state of Oregon MFMPs guides the Department through a consistent and transparent approach to the management of Oregon's marine fishery resources. By placing Oregon's MFMPs into the context of existing international, federal, and state fisheries management, unnecessary duplication, contradiction and complication of regulations can be avoided. By providing a clear and flexible template for managers, MFMPs developed under this Framework will be able to incorporate the wide range of resources and fisheries under Oregon's jurisdiction. This Framework and associated MFMPs strive to facilitate the long-term sustainable use and enjoyment of marine resources for present and future generations of Oregonians.

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## **Appendix A: International and Federal Management Affecting Oregon Fisheries**

The following provides an overview of the numerous principles, agreements, policies, and treaties established by organizations managing fisheries at international and federal levels most pertinent to the development of Oregon's MFMPs

### **1. International Fisheries Management**

Sovereign nations have established Exclusive Economic Zones (EEZs) extending from the nation's coastal baseline seaward to 200 nautical miles within which the nation has authority for management and conservation of all living marine resources. The management of certain marine fisheries within the jurisdiction of the state of Oregon is directed by agreements, treaties, and overarching policies established by international organizations. Fish stocks that are highly migratory who are limited in range to the high seas, or whose ranges straddle multiple EEZs are the focus of international management efforts. Identified in the following are existing international organizations, agreements, and policies that regulate marine fisheries resources and/or are material to the development of Oregon's MFMPs.

#### **1.1. United Nations Fishing Agreement**

Known formally as the "Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks" this treaty, commonly referred to as the United Nations Fishing Agreement (UNFA) establishes a framework for the conservation and management of highly migratory species and straddling stocks. The UNFA recognized a number of general principles for managing these stocks that led to a concerted effort to implement an ecosystem approach to fisheries management (Balton and Koehler, 2006). Ratifying nations, of which the United States is one, agree to apply a precautionary approach to managing the harvest of these stocks (Article 6) and to strive for compatibility of conservation and management measures (Article 7) both on the high seas and in the sovereign waters of the ratifying nation.

#### **1.2. International Pacific Halibut Commission**

In 1923, a convention between the United States and Canada established the International Pacific Halibut Commission (IPHC). The purpose of the IPHC is to assess, conduct research on, set policy for, and manage the Pacific halibut stock within United States' and Canada's EEZs by annually setting a total allowable catch (TAC) in the northeast Pacific. Three government appointed commissioners from the United States, along with three from Canada, are designated to preside over the IPHC. Pacific halibut, a straddling stock harvested and landed in Oregon, is managed by this bilateral international organization to the extent that it sets the TAC for the area that includes the waters off California, Oregon, and Washington, and issues licenses to commercial and charter vessels that retain halibut caught in these waters. For more information see <http://www.iphc.int/home.html>.

#### **1.3. The Inter-American Tropical Tuna Commission**

The United States is a member of the Inter-American Tropical Tuna Commission (IATTC), established in 1950, which is responsible for the management and conservation of tuna species in the eastern Pacific Ocean. Each of the twenty-one member nations is represented by up to

four Commissioners appointed by their respective governments. The IATTC forms recommendations regarding the harvest of tunas, including albacore tuna, landed in the state of Oregon. These recommendations are then considered and approved by the United States Department of State. Once approved by the State Department, the National Marine Fisheries Service implements regulations and management actions to effectuate IATTC recommendations such as quotas or any other limits on harvest for a particular species.

#### **1.4 Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean**

The WCPF Convention, as it is commonly known, mirrors the general principles laid out in the UNFA for managing highly migratory fish stocks such as tuna, billfish and sharks. The WCPF Convention seeks to address problems in management of high seas fisheries for highly migratory fish stocks in the region. The WCPF Convention, which became effective in 2004, established the Western and Central Pacific Fisheries Commission composed of representatives from members to the Convention, cooperating non-members and territories. As of 2014 there are twenty-six members of the Commission, eight cooperating non-members and seven participating territories. The United States is a member. The Commission has established a memorandum of understanding with the IATTC and other regional fisheries management organizations. The Commission holds annual meetings to consider conservation and management measures. Albacore tuna is one of the highly migratory species that the Commission works with that is relevant to Oregon fisheries. Vessels fishing in the WCPF Convention area sometimes land their catch in Oregon.

#### **1.4. Pacific Coast Albacore Tuna Vessels and Port Privileges Treaty**

To specifically facilitate the harvest of the highly migratory albacore tuna stock that ranges between the United States' and Canada's EEZs, the Pacific Coast Albacore Tuna Vessels and Port Privileges treaty was signed in 1981 and has subsequently been amended on several occasions. This agreement establishes each nation's right to harvest albacore tuna in the other nation's EEZ seaward of 12 miles from the coastal baseline, and allows each nation's vessels to use certain ports of the other nation for multiple purposes including obtaining crew, provisioning and vessel maintenance. This agreement does not set limitations on TAC, however. The United States and Canada have agreed to exchange data pertinent to this fishery.

#### **1.5. Pacific Whiting Treaty**

The Pacific Whiting Treaty, known formally as the "Agreement Between the Governments of Canada and the Government of the United States of America on Pacific Hake/Whiting", was first signed in 2003 and implemented in 2012. Pacific whiting (also known as Pacific hake) is a straddling stock that ranges within both countries' EEZs. This treaty strengthens cooperation between the United States and Canada and allocates agreed percentages of the TAC of Pacific Whiting to each country. The Joint Technical Committee (JTC) conducts an annual stock assessment to determine potential yield of the whiting fishery, while the Scientific Review Group independently reviews the work of the JTC. The Joint Management Committee determines TAC for whiting every year. An industry advisory panel reviews the management of the fishery and provides input regarding TAC.

## **2. Federal Fisheries Management**

Marine fisheries conducted by vessels within the jurisdiction of the United States are managed by multiple federal agencies, organizations, and legislative acts of Congress. Summarized below are existing federal legislation and government bodies that provide overarching regulation of marine fisheries management under which state of Oregon MFMPs will be developed and operate.

### **2.1. Federal Legislation Integral to the Development of MFMPs**

Legislation enacted by the federal government shape Oregon's jurisdiction over marine fisheries, and establishes harvest regulations for numerous marine resources under state purview. Legislative acts pertinent to Oregon's MFMPs are:

#### **a. Presidential Proclamation 5030 (1983)**

Presidential Proclamation 5030 authorizes the establishment of the United States' Exclusive Economic Zone (EEZ), defined as the area 200 nautical miles seaward of the coastal baseline and onto the continental shelf of all United States and U.S. Territories. This proclamation also:

- asserts the United States' sovereign right over the jurisdiction and management of all living natural resources within the EEZ, and;
- commits the United States to protecting the marine environment within the EEZ.

#### **b. Submerged Lands Act (1953)**

The Submerged Lands Act (43 U.S.C. § 1301) grants states title to the seabed, the marine waters, and the resources contained within the geographic area seaward three nautical miles from either a state's coastal baseline or from the low water baseline of offshore islands or rocks. This area is commonly referred to as a state's territorial sea.

#### **c. Magnuson-Stevens Fishery Conservation and Management Act (1976)**

The Magnuson-Stevens Fishery Conservation and Management Act (MSA; NMFS 2010a) is the primary law governing federal marine fisheries management in United States. The MSA was amended and reauthorized in 1996 and 2006. The MSA establishes the United States' jurisdiction over marine fisheries management throughout the EEZ, beyond the EEZ onto the continental shelf, and over anadromous fisheries throughout the migratory range of these species beyond the EEZ. The MSA also establishes an inner boundary for the U.S. EEZ that is coterminous with a coastal state's territorial sea. The MSA establishes national standards for fishery resource conservation, fishery management, and the development of fishery management plans (FMPs) based on the best available science to achieve optimum yields while preventing overfishing. To manage United States fisheries by region and to promote the conservation of fish stocks, the MSA created eight regional fishery management councils authorized to develop and implement FMPs and policy. The MSA gives the Secretary of Commerce authorization to evaluate, approve, and implement federal FMPs. The original Act promoted the development of a domestic fishing industry by phasing out foreign fishing fleets in the United States' EEZ. The 1996 Sustainable Fisheries Act amendment to the MSA focused on defining measurable criteria for overfished stocks, rebuilding overfished species, protecting essential fish habitat, promoting recreational catch and release programs, and reducing bycatch. The 1996 amendment also gave the states of Oregon, Washington, and

California conditional jurisdiction over the Dungeness Crab Fishery adjacent to these states out to the 200 nautical mile EEZ boundary. The 2006 amendment strengthens the mandate to end and prevent overfishing, promotes market-based management approaches, provides a larger role for science in decision making, and promotes enhanced international cooperation in fisheries management. Key provisions include annual catch limits based on scientific advice and accountability measures for all FMP species.

#### **d. Endangered Species Act (1973)**

The Endangered Species Act (ESA) is one of the primary laws utilized to protect fish, wildlife and flora within the United States (USFWS 2009). The purpose of the ESA is to protect any species identified as being in danger of extinction throughout all or a significant portion of its range (endangered), or likely to become endangered in the foreseeable future (threatened). The ESA provides a program for conserving these species, and mechanisms to implement steps necessary to enforce international treaties relevant to the protection of any threatened or endangered species within the United States. Moratoriums on the harvest of species listed under the ESA apply to such marine resources occurring in Oregon marine waters.

The National Marine Fisheries Service (NMFS) and the United States Fish and Wildlife Service (USFWS), of the Department of the Interior, share the responsibility of administering the ESA. The NMFS has primary responsibility for protecting marine and anadromous fish and wildlife species. Marine fisheries that interact with threatened or endangered species may be subject to management restrictions implemented to protect these species.

#### **e. Marine Mammal Protection Act (1972)**

All marine mammals occurring in Oregon waters are managed by federal legislation and agencies. The Marine Mammal Protection Act (MMPA) gives management jurisdiction for most marine mammals, including pinnipeds and cetaceans, to the NMFS (NMFS 2010c; Marine Mammal Commission 2010). The USFWS is, however, responsible for the protection of otters, walruses, polar bears and manatees. A third federal agency, the Marine Mammal Commission, reviews existing policies and makes recommendations to NMFS and USFWS for improving the implementation of the MMPA. The MMPA establishes a national policy for preventing marine mammal species from declining to the point “where they cease to be significant functioning elements of the ecosystems of which they are a part” (NMFS 2010c). To this effect, the MMPA establishes a moratorium on killing, capturing, or harassing marine mammals within United States’ waters, although exceptions are allowed with appropriate authorization from NMFS. Marine fisheries that interact with marine mammals may be subject to management restrictions implemented to protect these species.

#### **f. Migratory Bird Treaty Act (1918)**

The Migratory Bird Treaty Act (MBTA) is legislation implementing agreements, treaties and conventions between the US, Mexico, Canada, Japan, and the former Soviet Republic (now its successor state Russia) for the protection of migratory birds. The MBTA prohibits the harvest, killing, sale or possession of migratory birds, any parts, eggs, or nests. A list of the birds subject to protection under the MBTA is located at the USFWS Migratory Bird

Program website. Marine fisheries that interact with and incidentally take migratory birds may be subject to management restrictions implemented to protect these species.

### **g. Coastal Zone Management Act (1972)**

The Coastal Zone Management Act (CZMA) recognizes the importance of meeting the challenges of continued growth in the coastal zone. Some of the key goals of the CZMA include protecting natural resources, providing public access for recreation, managing development in high-hazard areas, giving development priority to coastal-dependent uses, and coordinating state and federal actions. Two national programs were created under the CZMA, the Coastal Zone Management Program and the National Estuarine Research Reserve System.

## **2.2. Federal Fishery Management Bodies**

The following management bodies develop and implement federal fisheries management policies and FMPs for Pacific Ocean waters of the U.S. west coast including Oregon:

### **a. National Marine Fisheries Service (NMFS also known as NOAA Fisheries)**

Fisheries management within the United States' EEZ falls under federal jurisdiction of and is regulated by NMFS, a line office of the National Oceanic and Atmospheric Administration (NOAA) which is one of the Bureaus in the Department of Commerce. The NMFS mission is to provide:

*“stewardship of living marine resources for the benefit of the nation through their science-based conservation and management and promotion of the health of their environment.”*

As mandated by the MSA, NMFS shares responsibility for fisheries management in the United States' EEZ and out onto the continental shelf with eight Regional Fishery Management Councils. The Councils advise NMFS. In some instances, NMFS develops FMPs for fisheries within the EEZ; however, NMFS more often evaluates and approves FMPs developed by the Regional Fisheries Management Councils. Policies set by NMFS exercise authority over the harvest of marine resources within United States EEZs and establish the harvest specifications and management measures for species included in FMPs. Rule-making by NMFS is announced in the Federal Register.

### **b. Pacific Fishery Management Council**

The Pacific Fishery Management Council (Council) is one of the eight regional councils mandated by MSA. Many marine fish stocks off the state of Oregon are under Council jurisdiction. The Council is charged with exercising sound judgment in the stewardship of fishery resources along the west coast of the United States. The Council is comprised of 14 voting members from Oregon, Washington, California, and Idaho. Representatives are from state fish and wildlife agencies, Indian tribes, or are private citizens who are knowledgeable about recreational and commercial fishing and conservation (NMFS 2010a). The Council prepares FMPs for fisheries under the jurisdiction of NMFS and recommends annual catch limits (ACLs) and management measures for species and species complexes in FMPs. The Secretary of Commerce approves federal FMPs before plans are implemented. Once a FMP has been approved, federal regulations are adopted to implement management measures.

Federal FMPs that direct management of some species and species complexes harvested and landed in Oregon's marine waters include:

- *The Pacific Coast Groundfish Fishery Management Plan* (managed species: 64 rockfish, 12 flatfish, 6 roundfish, 6 sharks and skates, and 3 other species); <http://www.pcouncil.org/groundfish/fishery-management-plan/>
- *The Coastal Pelagic Species Fishery Management Plan* (managed species: northern anchovy, market squid, Pacific sardine, Pacific mackerel, and jack mackerel); <http://www.pcouncil.org/coastal-pelagic-species/fishery-management-plan-and-amendments/>
- *The Highly Migratory Species Fishery Management Plan* (managed species: North Pacific albacore, yellowfin, bigeye, skipjack, and northern Bluefin tunas; common thresher, pelagic thresher, shortfin mako, and blue sharks; striped marlin; Pacific swordfish; and dorado); <http://www.pcouncil.org/highly-migratory-species/fishery-management-plan-and-amendments/>
- *The Salmon Fishery Management Plan* (managed species: Chinook, coho, and pink salmon); <http://www.pcouncil.org/salmon/fishery-management-plan/>

These FMPs regulate the harvest of associated fish stocks in Oregon unless the state determines more specific or conservative regulations are needed to sustain these fisheries.

## Appendix B: Overview of Analysis and Management Tools

The following two tables provide information about many of the analysis (Table 1) and management (Table 2) tools available. These tables are meant to provide an overview with examples rather than to be a comprehensive list. It is recognized that there is ongoing innovation and development of tools for analyzing and managing fisheries. Fishery analysts and managers should evaluate the most current tools available and utilize those that suit the individual fishery best.

**Table 1.** Examples of modeling tools utilized for assessing the effects of fishing activity on stocks of living marine resources. The relative complexity rating for the model ranges from 1 (least) to 4 (most).

Method	Data Inputs	Description	References	Complexity
CUSUM (cumulative sum)	catch time series	determines if catch trend is significantly changing	Scandol 2003	1
LBIO (length-based indicators of overfishing)	catch time series; length frequencies and maturity schedule	evaluates current percentages of mature specimens in catches to general goals	Froese 2004, Cope & Punt 2009	1
PSA (productivity and susceptibility analysis of vulnerability)	growth; natural mortality; age at maturity; susceptibility of stock to fishing	produces a relative level of vulnerability of stock to overfishing	Patrick et al. 2009	1
Catch-MSY	catch time series; priors for $r$ and $K$ ; initial and final depletion rates	Schaefer type model that estimates MSY based on catch, life history characteristics and carrying capacity	Martell and Froese 2013; Rosenberg et al. 2014	2
SEINE (survival estimates in non-equilibrium situations)	catch at length series; growth; selectivity at length	uses growth to estimate different mortality at length rates during multiple time periods that can be compared to appropriate fishing mortality rates	Gedamke & Hoenig 2006	2
Length-based Spawning Potential Ratio	natural mortality; growth; catch at length	estimates total mortality (natural and fishing) to incorporate into a simple population dynamics model to estimate spawning potential	Ault et al. 2008	2
AIM (an-index-method)	catchability; exploitation index	uses catch data to infer stock status and estimates a relative mortality at which the population is likely to be stable	NOAA Fisheries Toolbox ( <a href="http://nft.nfsc.noaa.gov/AIM.html">http://nft.nfsc.noaa.gov/AIM.html</a> )	2

<b>Method</b>	<b>Data Inputs</b>	<b>Description</b>	<b>References</b>	<b>Complexity</b>
FLEP (fractional lifetime egg production)	two size frequency distributions (one prior to fishing pressure and one current); age-length relationship; length-egg production relationship; natural mortality	compares lifetime egg production between current and unfished state	O'Farrel & Botsford 2005, O'Farrel & Botsford 2006	2
AFS Extinction Risk Criteria	growth; fecundity; age at maturity; maximum age	determines a relative productivity level and uses observed declines to qualitatively assess risk	Musick 1999, Musick et al. 2000	2
In-season depletion estimator	catch time series by week; growth; recruitment; and survival	compares CPUE to real-time abundance estimates to produce an estimator	Maunder 2001	2
DB-SRA (depletion- based stock reduction analysis)	catch time series; age at maturity; natural mortality; annual productivity	uses productivity and derived stock parameters to estimate sustainable yields	Dick & MacCall 2010	2
VPA (virtual population analysis)	catch time series; natural mortality; fishing mortality; catch at age or length	projects cohorts backwards in time using an estimate of survivorship and fishing mortality	Pope 1972	3
SSRA (stochastic stock reduction analysis)	catch time series; relative abundances (CPUE); growth; length and age at maturity; uncertainty in survivorship; uncertainty for maximum sustainable yield; age and length frequencies	uses historical catches to estimate recruitment rates that can produce current stock sizes under different recruitment regimes	Walters et al. 2006	3
SSS (simple stock synthesis)	natural mortality; selectivity; growth; fecundity; depletion; stock-recruitment relationship	uses historical catch, assumptions about selectivity, and fixed life history parameters to estimate initial recruitment and provides an overfishing limit	Cope 2013	3
exSSS (extended simple stock synthesis)	natural mortality; selectivity; growth; fecundity; depletion; stock-recruitment relationship; relative abundances (CPUE); age or length composition	similar to SSS, except that life history parameters are estimated using simulations and abundance indices can be incorporated	Cope 2012	3

Method	Data Inputs	Description	References	Complexity
SS3 (stock synthesis version 3)	for each sub-area within a stock - catch time series; natural mortality; fishing mortality; catch at age or length; growth; spawner-recruitment relationship; selectivity; relative abundances; plus fishery dynamics information	calibrates a statistical population dynamics model primarily using age-structured data from both fishery-dependent and -independent data	Methot & Wetzel 2013	4
Colrairie	sex-specific catch at age and/or at length; from multiple gears/fleets; growth; multiple fishery-dependent or -independent indices of abundance	a generalized age-structure model that provides outputs on vulnerable biomass, recruitment, spawners and harvest rate trends fit to predicted CPUE and indices of abundances	Hilborn et al. 2000	4
MULTIFAN-CL	catch time series from one or multiple fleets; effort; length frequencies; various estimates of biological and fisheries data; can accommodate additional data inputs	a length-based, age-structured model that provides an integrated method of estimating catch age composition, growth parameters, mortality rates, recruitment, and other parameters	Fournier et al. 1998, Hampton & Fournier 2001	4

**Table 2.** Overview of fishery management tools.

Output (Catch) Controls		Measures that directly control amount of the resource caught.
Quotas	Maximum catch allowed for an area. Quotas can be allocated to specific user groups, gear types, sub-areas, or seasons. Generally used to allocate total allowable catch, quotas can also be used to allocate fishing effort or biomass.	
Biological		
	Size Limits	Usually a minimum size of an organism that can be retained by a fisherman. May be based on biology to allow the species to grow to reproductive size. Size limits can also be applied as a maximum size limit - fish over a certain size cannot be retained. A minimum size limit in combination with a maximum size limit is termed a slot limit.
	Sex Restrictions	Only individuals of a certain sex may be retained.
	Seasons	Harvest restricted during certain times of the year.
	Non-retention	Harvest of certain species is prohibited.
Recreational		
	Daily bag limits	Can only catch a specified number of fish/organisms per day.

	Annual bag limits	Can only catch a specified number of fish/organisms per year or season.
	Catch and release	Allows for the catch, but not retention of a species.
Commercial		
	Trip limits	Total allowable amount of a species or species complex, by weight, or by percentage of fish on board, that may be taken and retained, possessed, or landed per vessel from a single fishing trip.
	Cumulative trip (period) limits	Maximum amount that may be taken and retained, possessed, or landed per vessel in a specified period of time, with or without a limit on the number of landings or trips.
<b>Input (Effort) Controls</b>	Measures used to control the amount of fishing activity occurring on the fishing grounds in a given period of time (fishing effort). Input controls limit the amount of effort through such measures as time fished, vessel size, amount and type of gear. Input controls may be cost-effective management measures and minimize waste; however, it increases incentives to expand uncontrolled inputs and requires adjustment since technological advances result in increases in effectiveness.	
Area-based Management	Fisheries management conducted and implemented on a spatial scale for specific areas. These can include separate quotas for different areas, different limits for areas, permissible or excluded fisheries for specific areas, areas closed to certain gear types, certain fisheries, or fishing activity in general. These tools can also be put in place for biological reasons such as to restrict fishing effort in locations know to be hot spots for certain species.	
	Permanent	Areas closed or restricted permanently to harvest activities.
	Temporary	Area closed or restricted for a temporary period of time to harvest activities.
	Rotating	Areas closed for long periods of time (years, decades) and reopened to allow fishing. Areas may be rotated to offer a mixture of long-term protection of sensitive species and fisheries access.
	Depth	Fishing restricted at or to certain depths
Temporal-based Management	Season	Fishing closures for a defined period of time. Examples include closures used to protect spawning fish, molting crabs, or sensitive species.
Permits and Licenses	Permits and licenses can serve to structure fishing activity and can also be limited in number in order to restrict the total amount of fishing effort.	
	Area endorsements	Some permits limit fishing activity to particular areas or regions.
	Gear endorsements	Some permits place restrictions on the type of gear or specific gear configurations that can be utilized while fishing under that permit.

	Limited entry	Limited entry works by limiting the total amount of fishing effort by restricting the number of licenses or permits sold. Qualification is usually based upon historical fishing patterns.
	Permit stacking	Allows permit owners to register multiple limited entry permits to a single vessel. This tool can be utilized for socioeconomic reasons.
	Species endorsements	Some permits for particular fisheries limit the species that can be landed.
	Commercial Fishing License	License allowing the commercial harvest and sale of marine resources
	Charter boat license	License for charter boats. May be limited entry to control number of charter operators. Can be separate charter licenses for different recreational fisheries.
	Recreational Saltwater Fishing License	License to recreationally harvest marine resources.
	Shellfish License	License to recreationally or commercially harvest shellfish.
Gear Regulations	Gear restrictions and limits can be used as a method to limit effort or the type of fishing effort. Pot limits and gear type restrictions for harvesting certain species are examples. Prohibition of certain gears or gear specifications can also be used to reduce bycatch, limit fishing power and ghost fishing from derelict gear, and control impacts to habitats. Examples include bycatch reduction devices (BRDs), or devices or gear modifications used to reduce bycatch, often of specific species.	
<b>Limited Access Privileges</b>		
Where an individual fisherman, community, or other entity is granted the privilege to catch a specified portion of the total allowable catch. The incentive is to catch the full share at a low cost and sell the best quality fish at the highest obtainable price. Limited access privileges are concerned with: (1) how access to the fishery is restricted, (2) how much fishing effort each participant is allowed, or (3) how much catch each can take.		
Individual Fishing Quotas (IFQs)	IFQs allocate a certain portion of the total allowable catch to individual vessels, fishermen, or other eligible recipients based on initial qualifying criteria.	
Individual Transferable Quotas (ITQs)	IFQ that can be transferred. ITQs typically entail allocations of a certain amount of an established annual catch to individual fishermen or vessel owners. Once distributed, fishermen can buy or sell their share, or individual quota, to other fishermen or vessel owners.	
Territorial Use Rights in Fisheries (TURFs)	TURFs give an individual or group dedicated access to the resource within a specific area of the ocean.	
Community Quotas	Community quotas grant a specific portion of the allowable catch to a community. The community then decides how to allocate the catch.	
Fishing Cooperatives	Cooperatives are assigned a portion of the available quota, which is then split among various fishing and processing entities within the cooperative via contractual agreements.	
<b>Additional Tools</b>		
Angler Education	Educational programs for both the general public and targeted audiences; examples include to properly identifying fish species, reducing bycatch of prohibited species, and clarifying or gaining input on regulations	